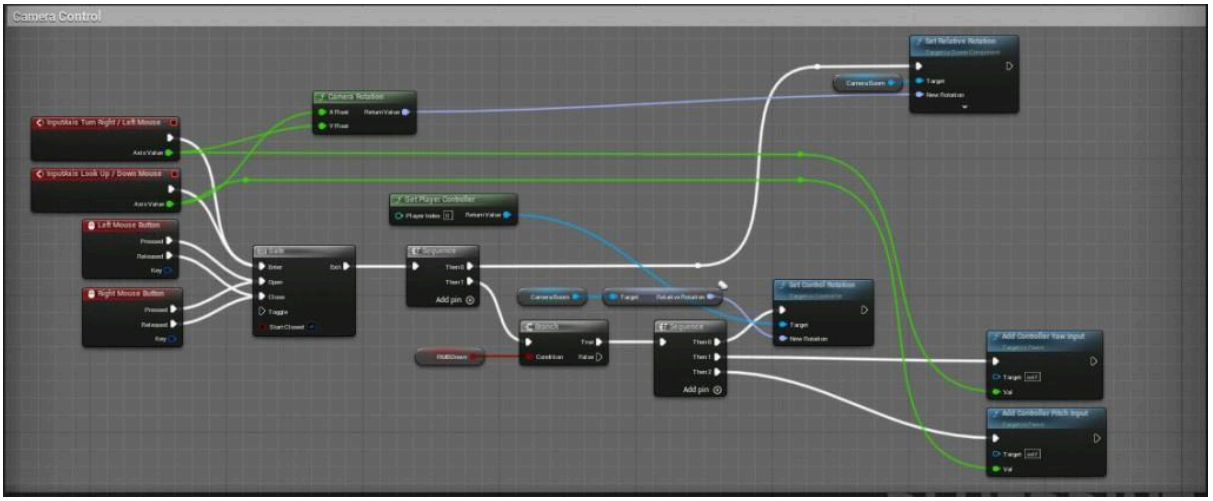
Player character development log progress #1

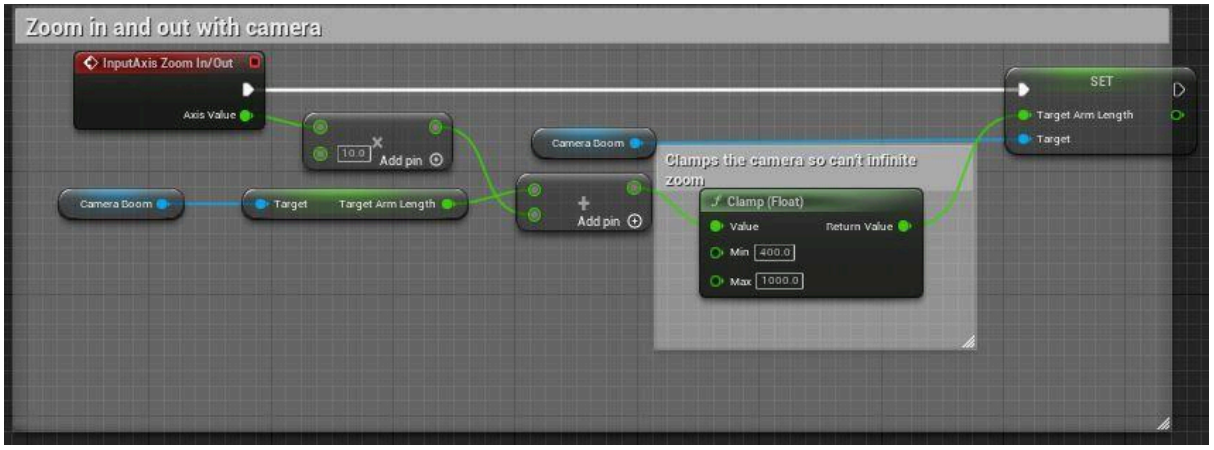
During this part of my development log I will be going into the blueprint used to create my camera systems on the player character for my solo RPG project and I will mention which games inspired me to create a system like this for the RPG verticle slice I am making.

Camera control section

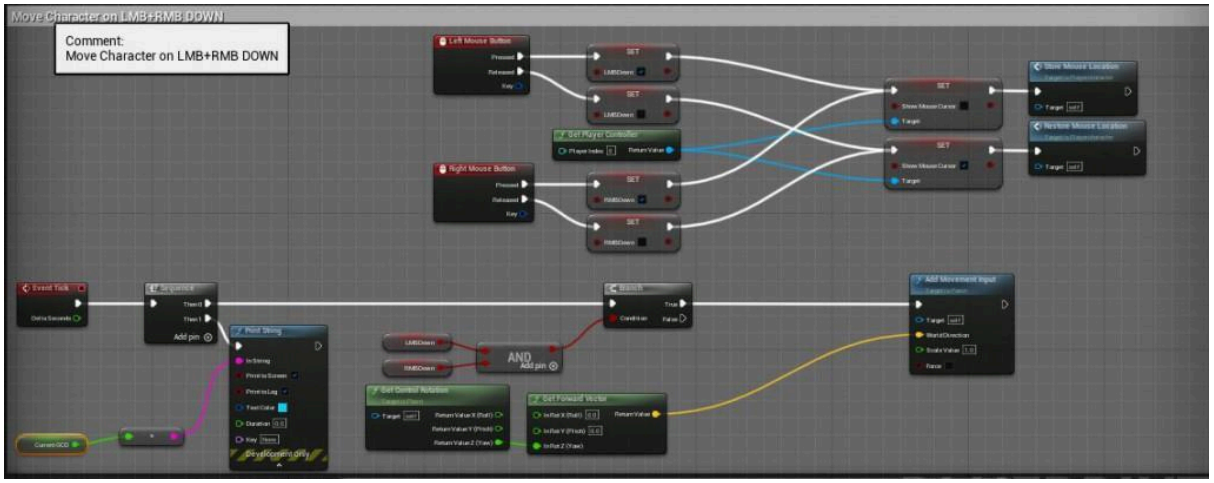
I adjusted the camera control blueprint in the player character so that you could drag around with the mouse cursor to look around allowing a sense of control for the player this is typical in a lot of RPG'S & MMORPG's such as 'World of Warcraft' 'Star Wars the old republic' which were the inspirations with how I wanted to create my camera control. After right button and left button pressed I set a gateway that goes into a sequence so that first it will set the relative rotation for the camera boom and camera rotation then go to the next stage which is where i set control rotation of the camera boon then it will set the controller yaw and pitch inputs. This allowed me to easily recreate how I wanted the camera to go, This was relatively easy to set up and wasn't many issues I ran into however I did have to research into how the gate node works which made it take a bit longer than I would of liked but it ended up nice and fulfils its function. I do think however it could be improved as currently the camera doesn't collide with the floor so you could see under the world which is a flaw, which I aim to have fixed by the end of this project, and the camera control isn't as fluid as industry games are such as being able to rotate the camera then zoom in closer to the character, mine is al little restricted the zooming in and out when you have rotated the character



In this blueprint in the player character I recreate what a lot of RPG's and MMORPGS such as 'World of Warcraft' 'Star Wars the old republic' have where you can zoom in and out with the camera using the mouse scroll wheel, for this I got the event for input axis zoom in/out and multiplied the axis value by 10 and plugged it into a plus node along with camera boom target and then the arm length and clamped it at min 400 and max 1000 which i then plugged it into the set node, this took a few attempts with the clamped floats to get it right, but i feel i got it into a space now where its not too much or too little and works for how I wish the design of this system to be.

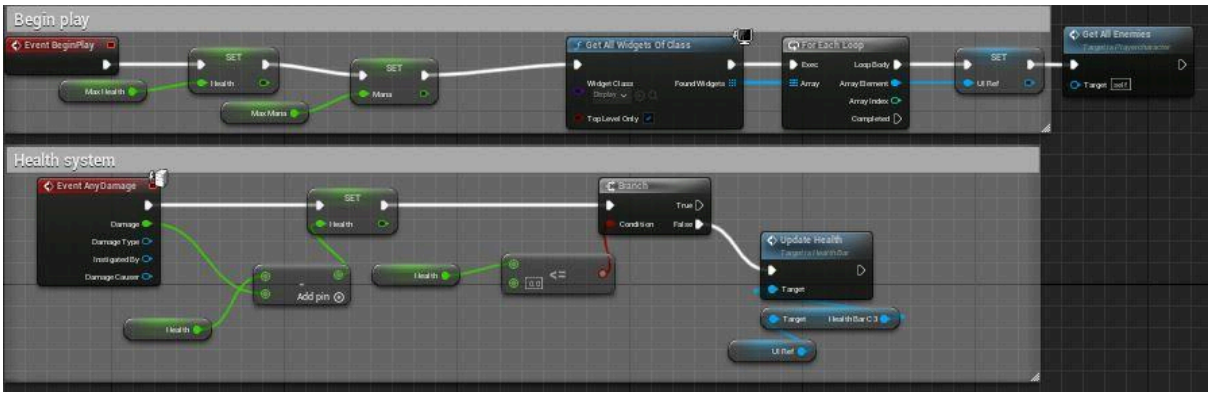


During this blueprint I wished to create a move character on mouse buttons which is in a sense camera movement, where on left button pressed and right button pressed it sets the RMB and LMB down on released and pressed then sets it for player controller and calls the events store mouse location and restore mouse location so it can return to its proper centred state, we then go on event tick into a sequence which first of all branches so that if true it adds movement input and on the world direction gets the forward vector and control rotation and for the branch the condition is LMB and RMB which links up to the blueprint above it, the then 1 is a prototype for linking my GCD on tick this will later move to an init chain. Companies in the games industry that made the likes 'World of Warcraft' and 'Star Wars the old republic' use this mechanic which is where my inspiration came to recreate this for my RPG as its a nice quality of life feature which I and many have used when one doesn't want to use the standard WASD layout.

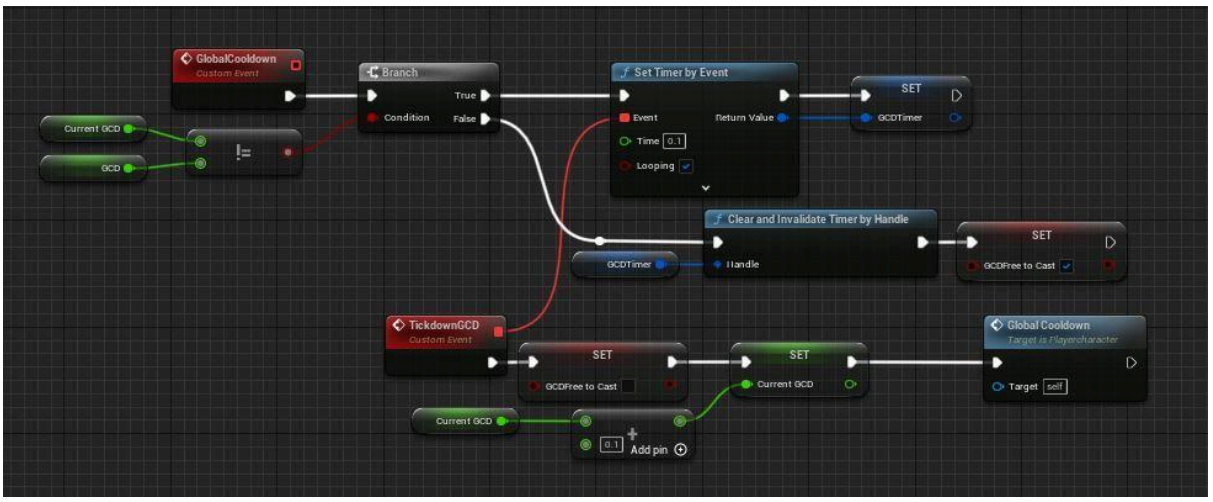


Player character development log progress #2

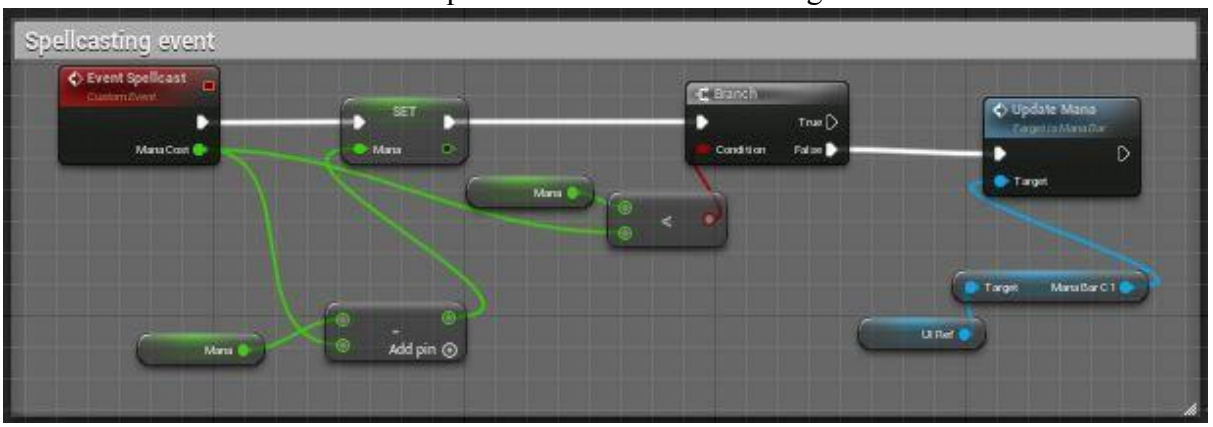
This is my begin play widget which sets the max health and mana floats on play and gets all the widgets so it displays the health and mana correctly which for each loops it and sets the UI reference and gets all the enemies to update theirs. The health system is so that on event anydamage it will take away health and update the health bar on the UI widget which calls the event from the UI called update health



This is currently my work in progress blueprint for my GCD which is my global cool down, currently it branches out from the event and the conditon is the current GCD and GCD loats, which when true it sets timer by event and loops and sets the GCD timer, then on false it clears and invalidates my timer by handle for the GCD timer and sets the GCD free to cast boolean, the true branch from set timer by event then goes to set the GCD boolean then sets the current GCD float and adds it on by 0.1 and calls the event global cooldown, which should give my characters spells a cooldown once used for example I use firebolt the player has to wait X number of seconds to reuse it, so far i've run into issues that it doesn't actually function or work in any capacity, i was using breakpoints by pressing F9 to figure out what was being called which has helped me figure out certain parts aren't being reached like tickdown GCD however I will aim by end of project to find a way around it and fix it or work on a replacement mid development encase. the message log was clear with no errors for it. Most industry RPG's have a working GCD for their spells/abilities/skills which work fluently such as 'World of Warcraft' Divinity Orginial sin 2' and Elder scrolls online, currently mine is flawed and has ran into issues, which I aim to fix.



This blueprint is an event called Event spell cast which sets the mana and uses the minus mode and a < node as the condition for the mana to calculate the cost then if false it will call the even update mana in the mana widget ui.



Mini map Development log progress #3

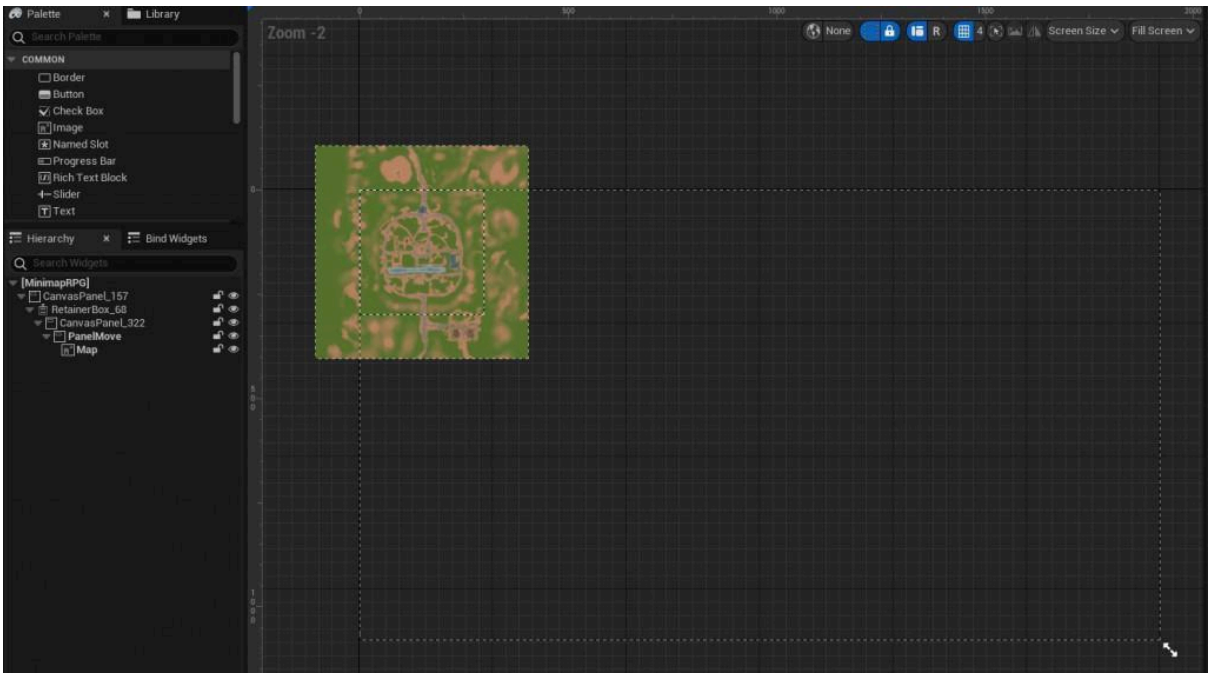
During this part of my development log I will be going into my minimap development progress for my solo RPG project and I will mention which games inspired me to create a system like this for the RPG verticle slice I am making. I was inspired to make this minimap as having played a lot of RPG's and MMORPG's the majority of them have some form of minimap which the player can easily glance at to see where they are in a more local confined space than a full blown map which they could open up.

This inspired me to create a mini map I could use for my solo project as it's used in industry games as I'd say a fundamental system as this point in RPG's/MMORPG's like 'World of Warcraft' 'Witcher 3', 'Elder scrolls online' and 'Divinity: Original Sin 2' to name a few

examples. Industry minimaps in these games are fundamentally more complex and fluent then the one I have created as they have custom artwork for the borders and extra quality of life options like zooming in and out or turning of specific items and showing a bunch of icons on the minimap for shops and so on, however for me this was out of scope in the time I had so I decided not to do it, however if I carried on this project further I would defiantly incorporate them. Originally my minimap was just a square map on the screen however I iterated onto it to create the mask effect which made it circler and to me felt more eye appealing and natural.

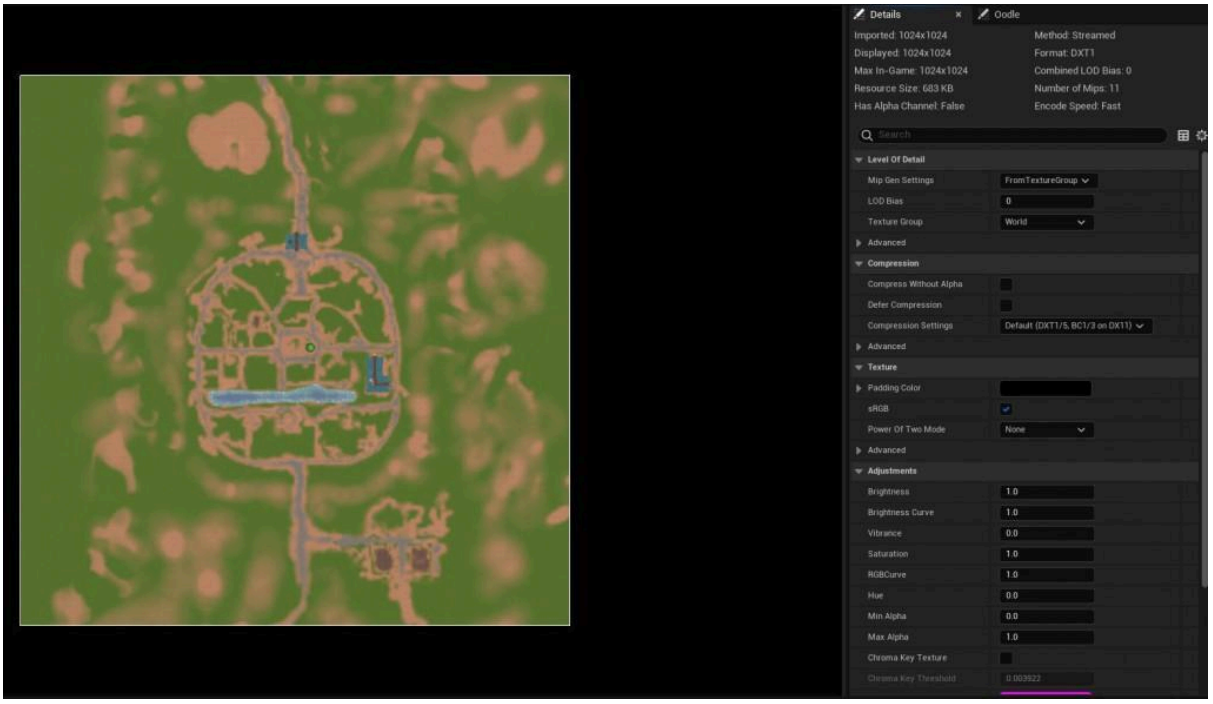
I ran into a few issues when creating the minimap such as having the wrong values in the map range clamped for my projects level boundaries however after taking a closer look and adjusting the numbers it worked out and a few issues regarding widgets being the wrong size in the widget design view leaving it to not update properly when put into the main display widget however after adjusting numbers and anchors i managed to fix this issue and it now displays as it should on my main display.

I created a widget called Minimap RPG and added a canvas panel which contained a retainer box so i could then retain a canvas panel side of this which would hold my panel move canvas and the image of the minimap. The retainer box allows me to render child widgets into my main widget which is really useful for the minimap I am creating. The retainer box also allowed me to add my masking effect which i will talk about below.

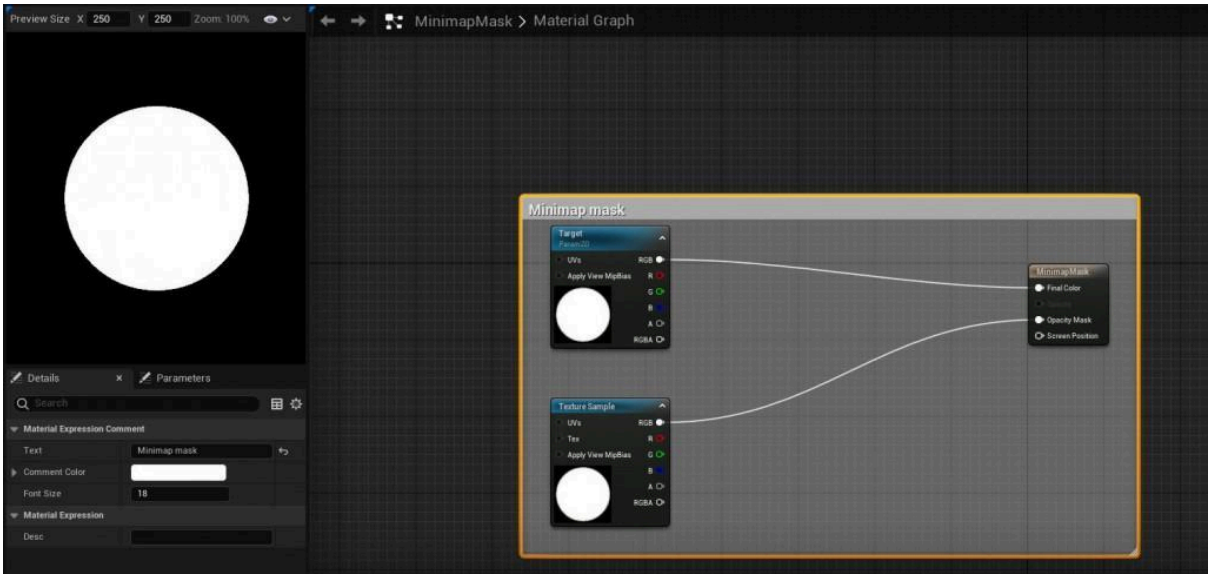


I created my minimap image buy going into the top view of my level changing from perspective so I could screenshot the map this view allowed for an easy view for my minimap

which i then put into photoshop on a 1024x1024 canvas panel so I could import it into UE5 as a TGA file, allowing me to use it for my image in my minimap widget.

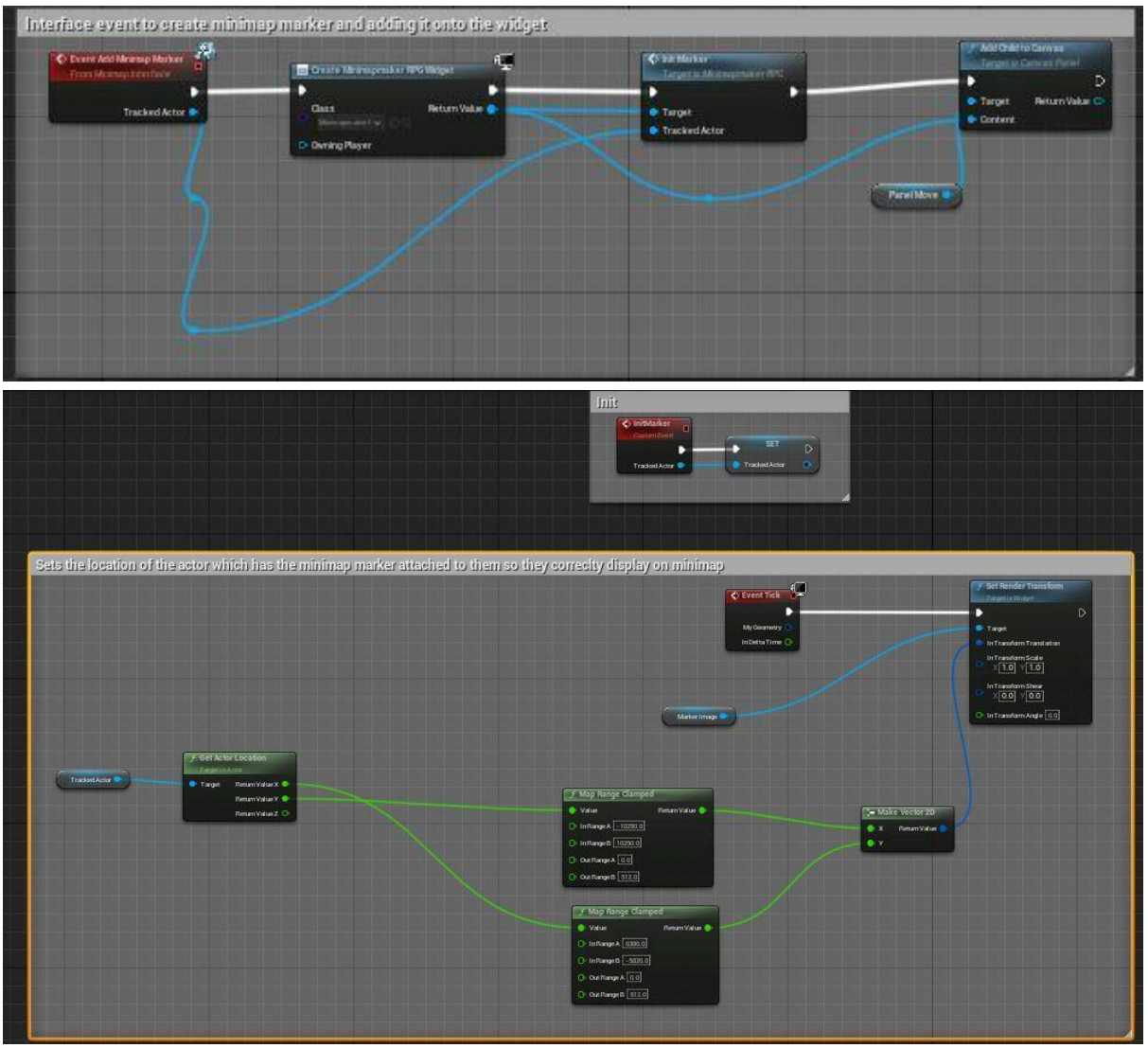


As I wanted a circle minimap I created a mask for this and turned it into a material so I could put it onto the widget retainer box effect which allows my map to display as a circle while only showing the objects inside of the circle however moving the map when the character locations moves.

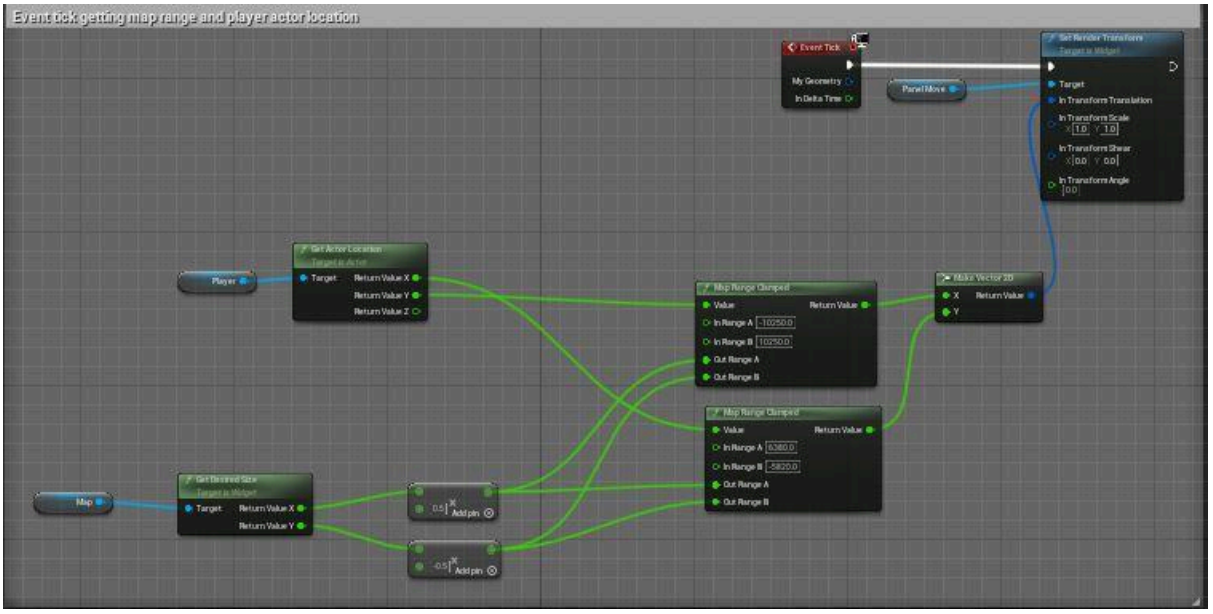


This is my blueprint in the widget for my RPG minimap which is a custom event called Initminimap which links into my main display widget where it calls this init so it goes into the init chain to call it and set the widget up so it works and is functional. while the init chain is in a separate main display (master ui) widget i will display it down below for context of how it is being called.

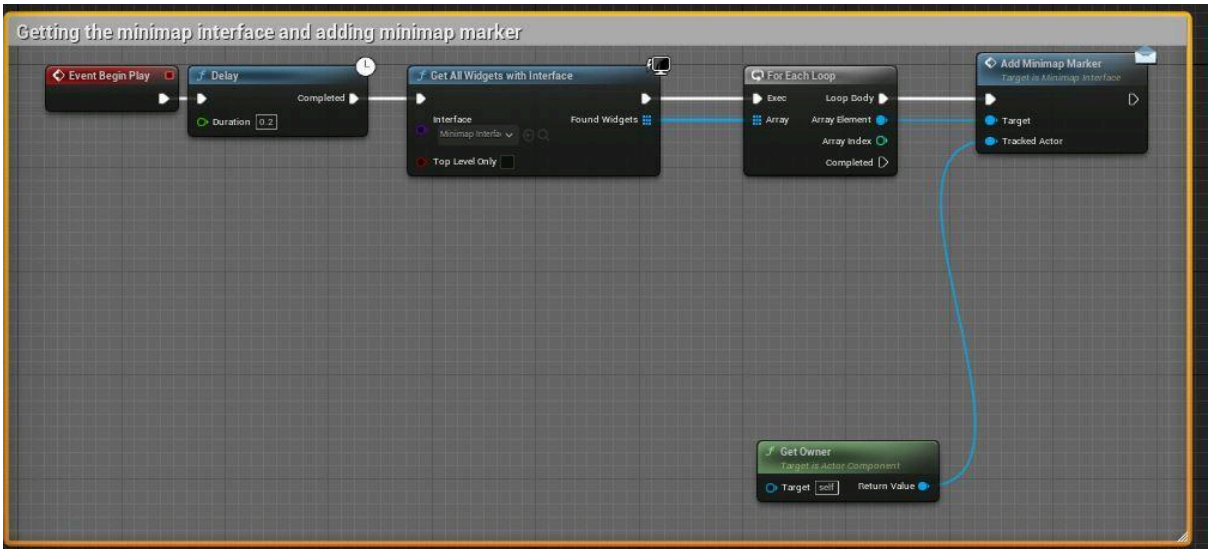
This blueprint chain is getting the event minimap marker interface blueprint and creating a widget of the minimap marker RPG widget which holds the icon which displays any widgets that have the widget interface attached to them. Which calls the minimap marker init and then adds the child to canvas. The init marker as seen in the minimap marker rpg widget is setting the tracked actor (for example player, enemy or object actor). It uses an event tick so its always updating in this circumstance and will work similar to the main widget minimap rpg blueprint however with a few differences. As it will set the render transform of the marker image as where the tracked actor who has the minimap marker interface attached to them, this uses get actor location and puts the return value Y into the map range clamped which goes into X as actual UE5 level area is inverted to the widgets and then vise versa with X going into another clamp range which converts to Y on a make Vector 2D node.



This blueprint is held in the main minimap rpg widget where as i said earlier it is similar to the marker bp however in this instance the only difference is that when we get the actors location it gets the players location so it can live track where the player is when they move so the minimap moves around the image on point. and the map gets the desired size of the play area set in the map clamp range but multipled by 0.5 and -0.5 so it adjusts it to the size correctly of the image.



Below is blueprint in my minimap component which on begin play delays it for 0.2 seconds so it isn't instantly there and allows for other begin plays to funnel through first, but it will get all the widget with interfaces and add the minimap interface and for each loop it so i can add the minimap marker event and get the owner of the tracked actor (whether its player, enemies or an object)



Below is a close up image of the final minimap which shows the player marked on the map as a temporary white square along with a test white square at centre of map which is just there for testing purposes, once the verticle slice is done I will implement a custom minimap marker. I also have a video of it working below to get a more realistic view of it working.

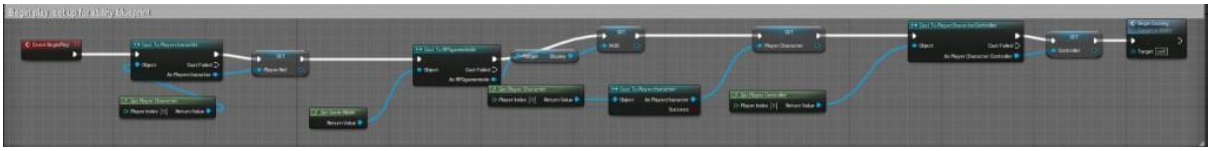
Spell abilities Development log progress #4

During this part of my development progress log I will be going into the blueprint for my spell abilities starting which shows all the core blueprints that get them to function using parent blueprint actors and child actor blueprints. This is for my solo RPG project and I will mention which games inspired me to create a system like this for the RPG verticle slice I am making. I was inspired to make this spell system as having played a lot of RPG's and MMORPG's the majority of them have some form of combat system/class system, as this is a verticle slice I will only be working with one class in the project which is a caster however down the line if i carried on this project I would add a choose class option and have differn't classes. During this I compared spell systems with industry games such as 'World of Warcraft' 'Divinity original sin 2' 'Skyrim' and the 'Witcher 3' this was to help me choose what style of combat system I wanted for my verticle slice RPG, for me I ended up choosing to have it like a 'World of Warcraft' tab targeting style combat, so you click on the enemy and click your spell from the ability bar which casts the spell and using homing projectiles to hit the target.

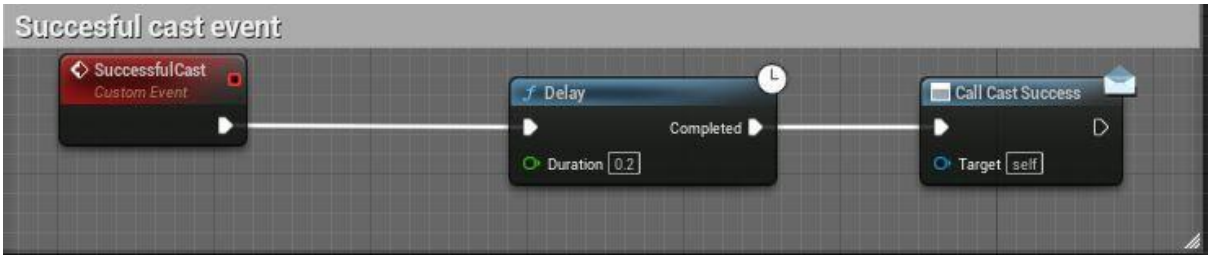
During this development process I did run into issues that arose during the development of this spell system, which I will go into when discussing the blueprints for this system, most of the issues I managed to iron out through debugging and research, however some I am still working out which I will talk about below.

Below is my begin play event in my parent 'Ability' blueprint which is where the core ability spell events and functions are held for the child actors, in the begin play we cast to the player character so that it can access the required components from there where I set the player reference then cast to my RPG gamemode and get gamemode to ensure I can use components from my gamemode blueprint and

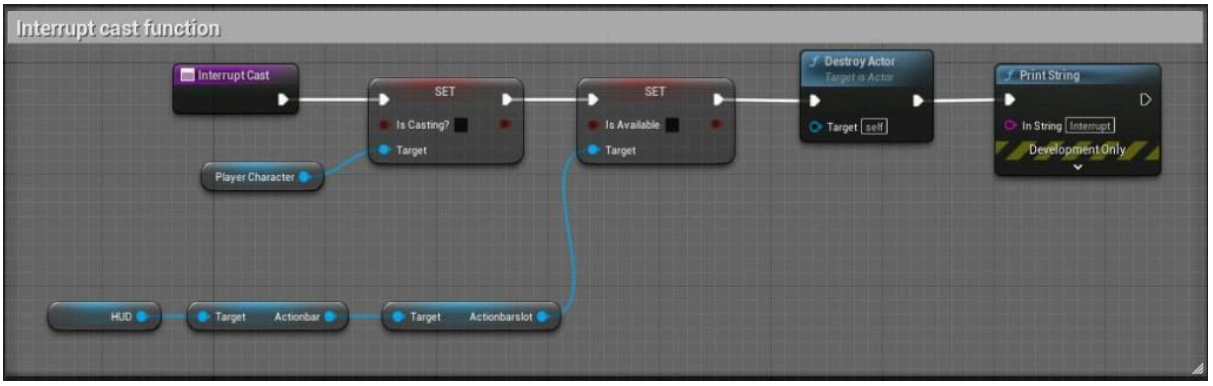
reference it properly, from here I get the target display and set the HUD for my UI then sets the player character and casts to the playercharacter controller which manages the character and sets the controller which goes into the function begin casting.



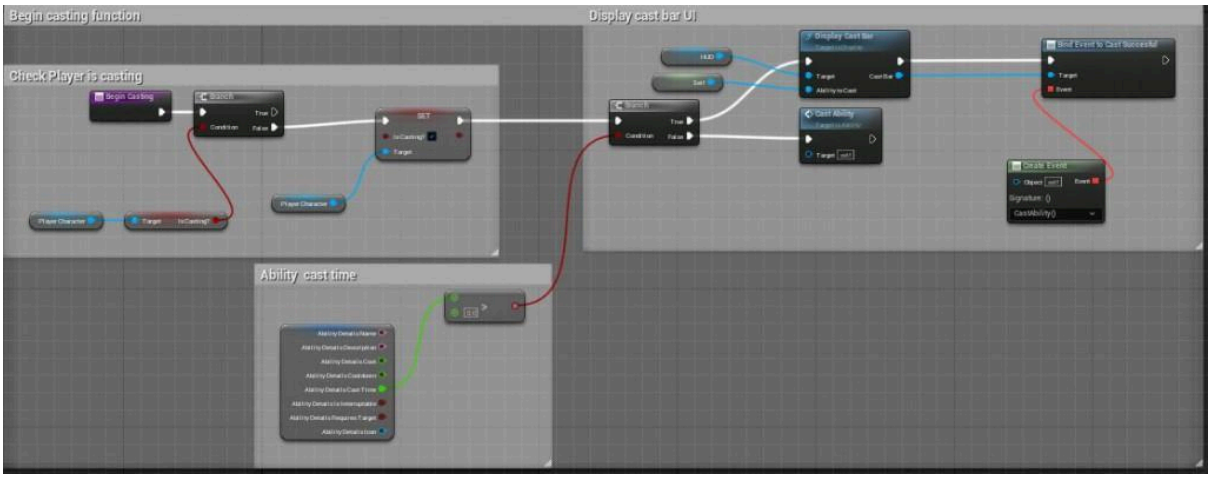
This is my successful cast event which has a 0.2 duration to allow other events to pass and then calls the cast success event dispatchers which will come in handy when it comes to my child actor blueprints for when theres a successful cast.



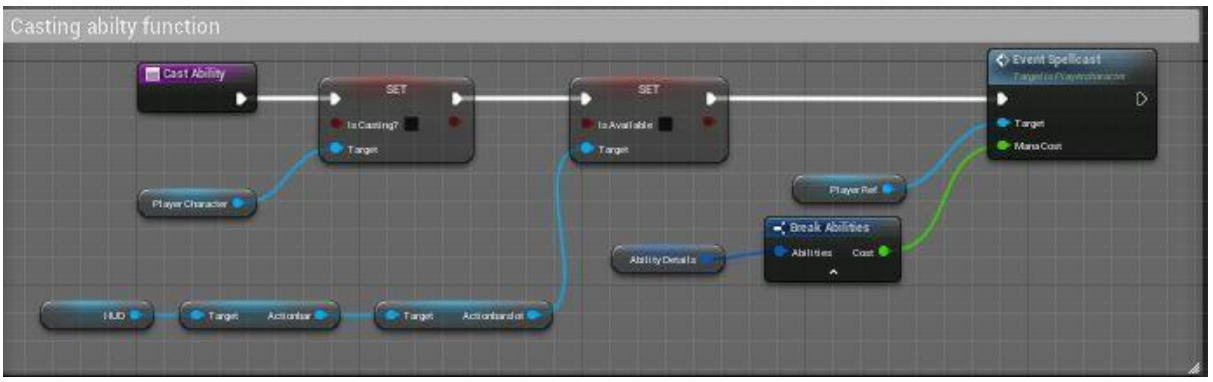
This is my interrupt cast function which sets is the player character casting to false then is it available booleaon to false which connects to the actionbar slot target which goes into the action bar which is connected to the HUD and after the set is available it will destroy the actor and display text saying interrupted (currently print string for testing purposes) this allows for this function to be used in my children when they get interrupted by for example moving when casting. This system works similar to how industry RPG's work like 'World of Warcraft' or 'Elder Scrolls Online and 'Star Wars the old republic' where if the character moves while casting a spell the cast is interrupted allowing to move away but at a cost, I was inspired to use this especially for balancing as it then means the player can't cast on move which could potentially lead to unintended exploits leading the balancing to be very poor when facing enemies if you can just move away from them and attack them without being hit.



This is my begin cast function for my blueprint ability, it starts with the begin casting function which branches of with a condition of is casting? connected to player character so if they are casting it will set the casting of the player to true, which branches of again, with the condition being the ability cast time which is for how long the ability takes to cast from the struct which will be used in the child actor spells, after the branch the true leads into display cast bar which is gotten from the HUD and then binds event to cast successful which creates the event cast ability and false then casts the ability.



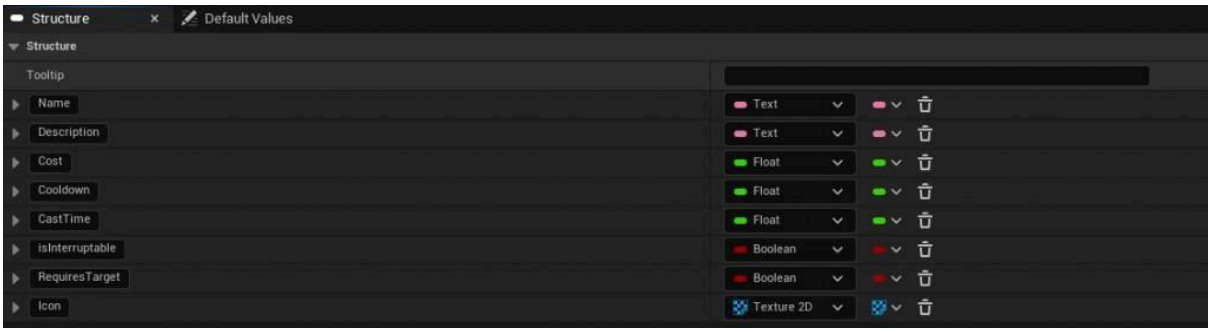
This is my casting ability function which from cast ability goes into set casting for the player character then set is available which links into the actionbar slot,actionbar and HUD, after this it will call the event spellcast from the player character which is shown in 'Player character development log progress #2' this then has the mana cost plugged into it from ability details struct which then breaks the abilities and I made it look cleaner by hiding all other pins apart from mana. This will link into the spell cast as if you haven't got enough mana it doesn't let you cast the spell and will link into how much mana is used when the spell is used in the child ability spell actors. I ran into issues where the ability cast time wouldn't work as intended when I input how long I wanted them to be this was because i didn't have the ability struct which contained the cast time, i then plugged it into a '>' and made it a condition after doing some research on the unreal engine forums, this then fixed the issue that was arising and I did some F9 debugging to see why it wasn't reaching the cast ability properly.

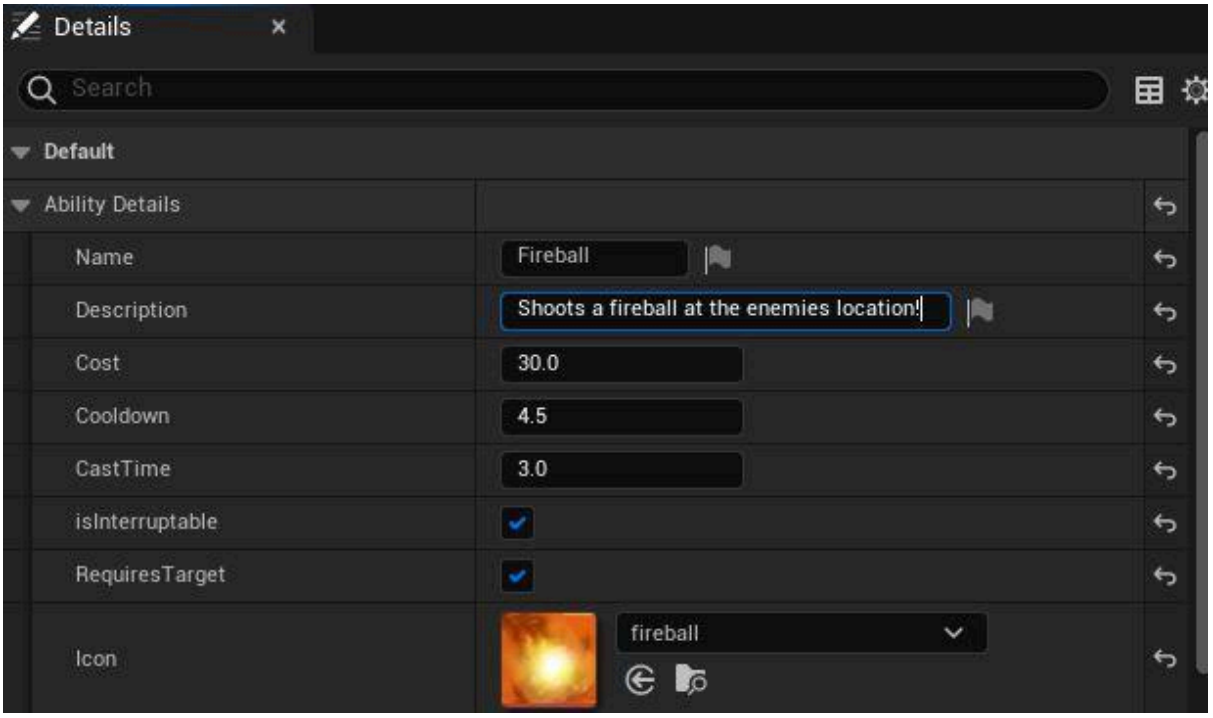


Spell abilities Development log progress #4.1

Here I will be going into my structure used for my spell abilities and the actor component. I used as struct as it's super efficient to mange when making new spells for my children spells being able to easily customise them to whatever use I want, for example a firebolt might have low mana usage and medium cast time, but a big healing spell might have a larger cooldown time but be an instant cast with a high mana cost, which will all come down to balancing and playtesting.

This is my blueprint struct which handles my data for the name, description, cost, cooldown, cast time, isinterruptable, requires target and icon for my children spells data, with it allows me when using the children to edit all these details of the spells for example if i want each spell to have a custom icon they can all have their own image for my actionbar, their own name to make them unique, description to explain what they do, and then I can manage the cost, cooldown time and cast time in floats. I also have an actor component which holds the spells in an array which will be used in my spell abilities and playercharacter so I can easily manage the access and use of the differn't spells I will be using and when attaching spells to my character. Below I also have an example from one of my children spells called 'Fireball' giving an example of how the ability details on the child spell have been filled out. It costs 30 mana to use and has a cast time of 3 seconds on which it will then have a 4.5 second cooldown, which will be adjusted on balancing.





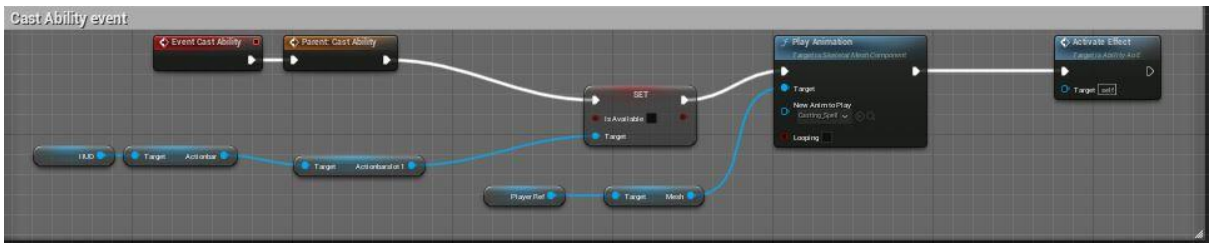
Spell abilities Development log progress #4.2

In this thread I will be talking about my development progress from my ability blueprints child blueprint actors 'Ability_AoE', 'Ability_Buff', 'Ability_Debuff', 'Ability_Projectile'. these are the children which will be used for when I create children/inherited actors for specific spells which allow me to make multiple of these types of spells for example a fireball projectile but also a frostbolt projectile and so on which is efficient for making new spells and balancing as it's using whats already created which can easily be adjustable workflow wise if i wish to expand this in the future.

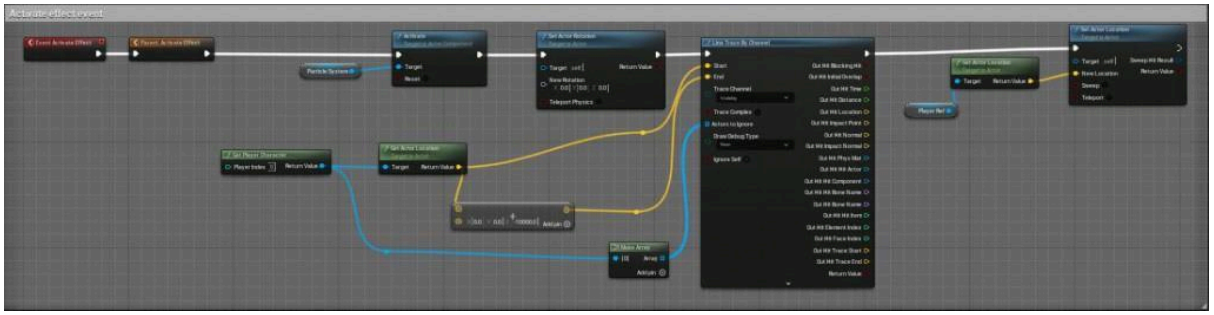
Ability AoE/AoE lifeground

Here I will be talking about my Ability AoE childclass and it's child AoE Iceground which all inherit from the parent ability blueprint, I will discuss what went wrong and worked well during the development of this.

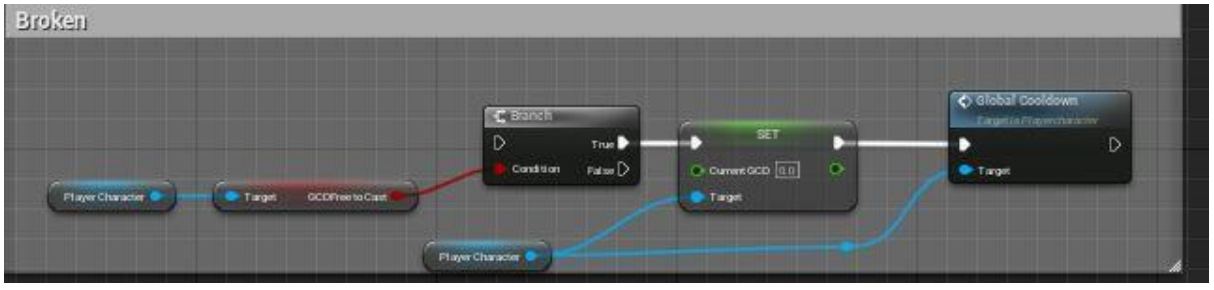
This is the cast ability event which connects to the parent event from 'ability actor' which then sets if it's available is so it will get the HUD, action bar and actionbar slot 1' which allows you to interact with the UI widget button, from there it will play the casting spell animation for the player ref and mesh and then get the activate effect event from the 'ability parent actor'



In the blueprint Activate effect it will call the parent activate event from the 'parent ability actor' then it will activate the actor component which is the particle system attached to the spell actor from the parent actor, it will then set actor rotation to X 0 Y 0 and Z 0 then get line trace by channel, which from start connects to get actor location which the target is player character which the player character connects into make array and then goes actors to ignore, the get actor location also gets a vector which it has set to -10000 so that it ends in the right location on the Z, after the line trace channel it gets set actor location then gets the actor location and the player reference so it spawns on the player, this is because its aoe healing effect which will heal the player so it must spawn on top of them instead of going towards a target.

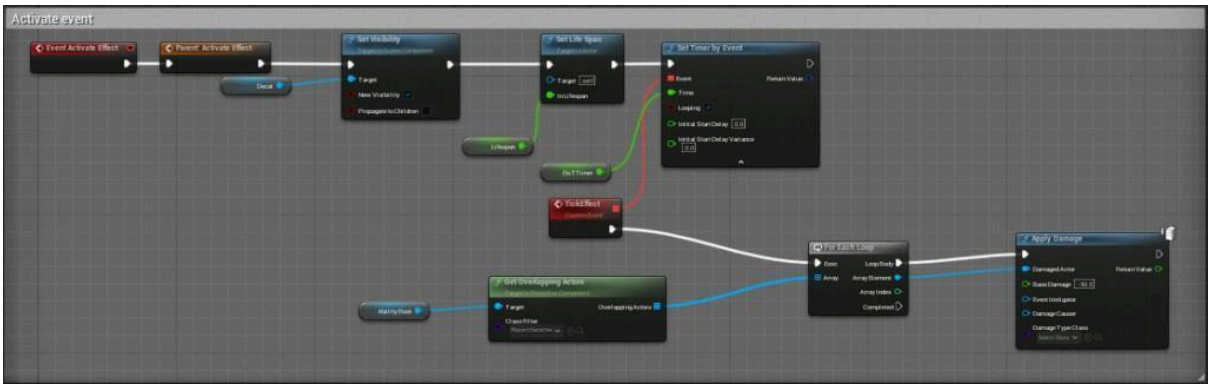


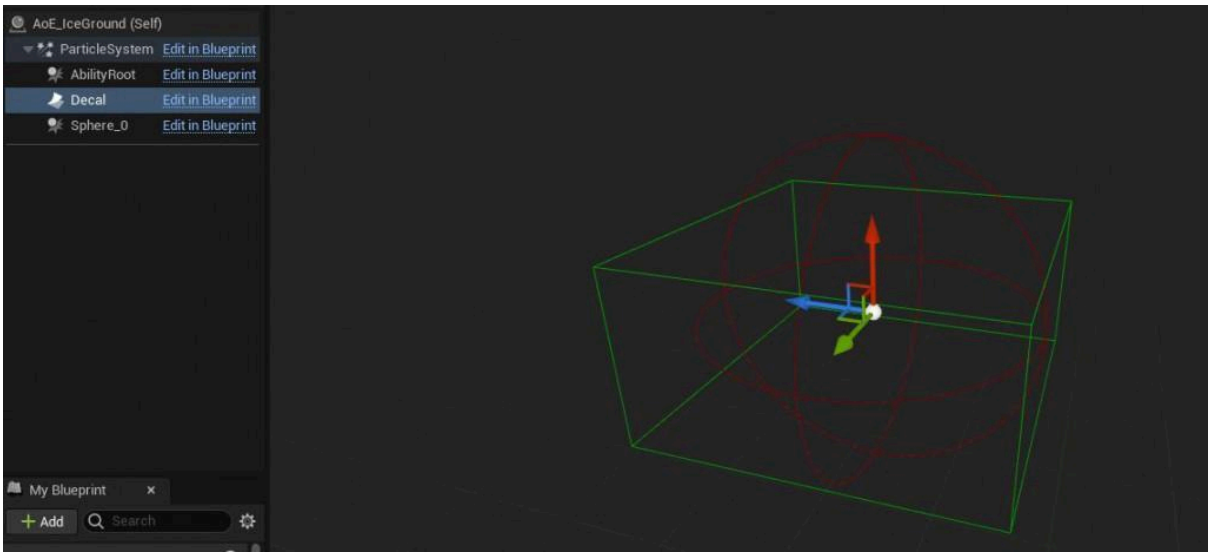
This is an old iteration of the GCD (global cooldown) which would be the cooldown for my spell, during this iteration, I found out through debugging it didn't work as intended as it wouldn't call the rest of my events after cast ability causing issues where the AoE spell wouldn't spawn when placed as it wouldn't reach that part of the scripting blueprint. I was going to use a boolean GCD free to cast which would check if the ability is able to be cast if true it would set the GCD to X time then call the global cooldown event in player character. I intend to go through another iteration of this which will work.



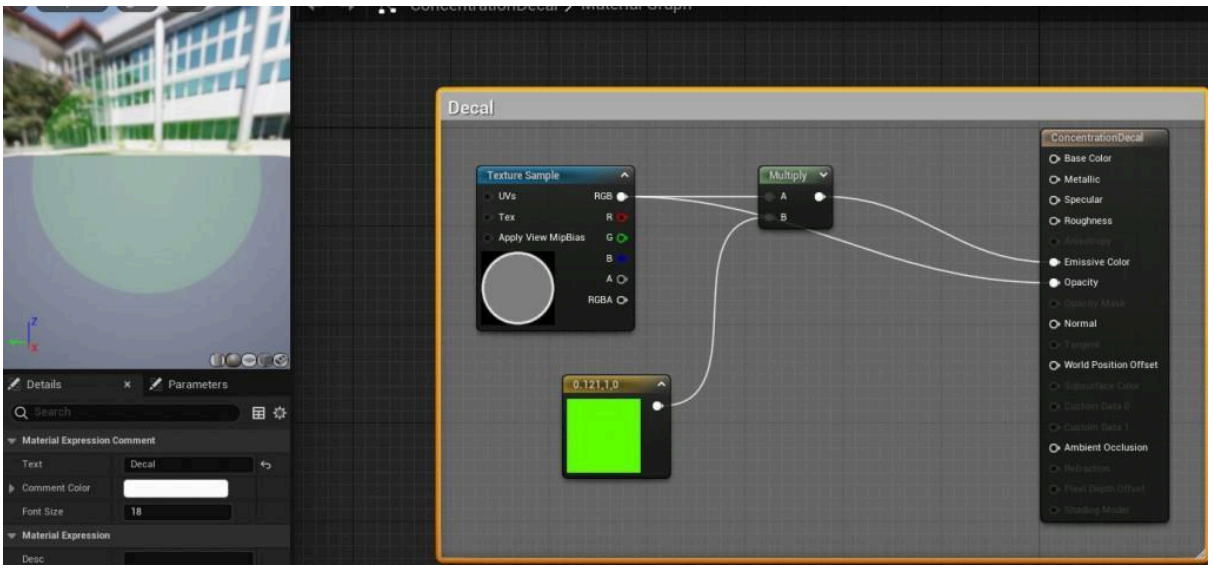
Below is the blueprint for the holyground spell actor which is a child and inherited from the AoE ability. From the activate effect and the parent activate effect it sets the set visibility of the decal to true and the life span to the custom float number I made so that it only spawns for X amount of time, after this is I have a set timer by event which has the DoT timer of how long it ticks for on the timer to heal you, which is looping and links into the event tick effect

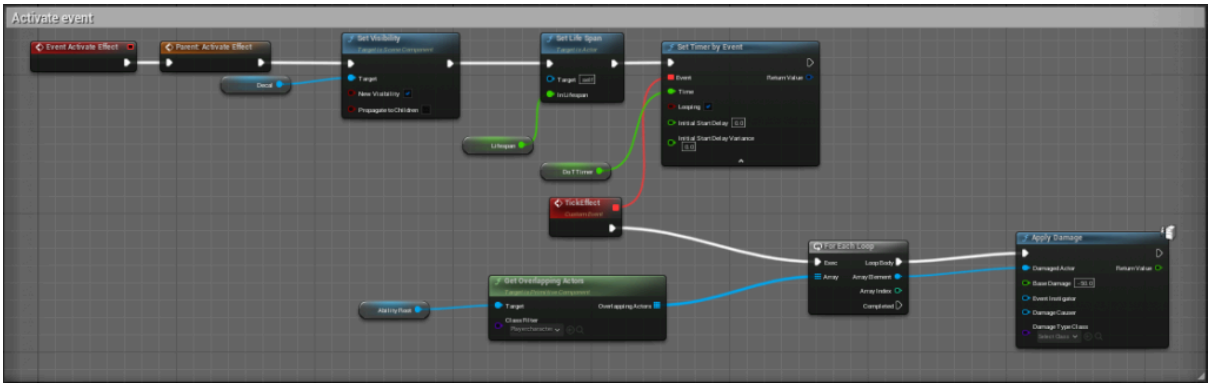
which goes into a for each loop so that on the array it gets overlapping actors which is the abilityroot (sphere collision) and the class is playercharacter, then it applys the damage to the array element which is -50 so that it ticks and adds health to the player going up in 50 implements. Below you can also see in the viewport the sphere collision and the decal size.





This is the decal material I created for my lifeground effect which uses a texture sample which multiplies into a colour (green) and then emissive colour and opacity to give it the effect its a healing area, as generally green is considered as good and makes the player think they will get health from it whereas back in the day for example Doom or Quake green was considered bad with the acid water.

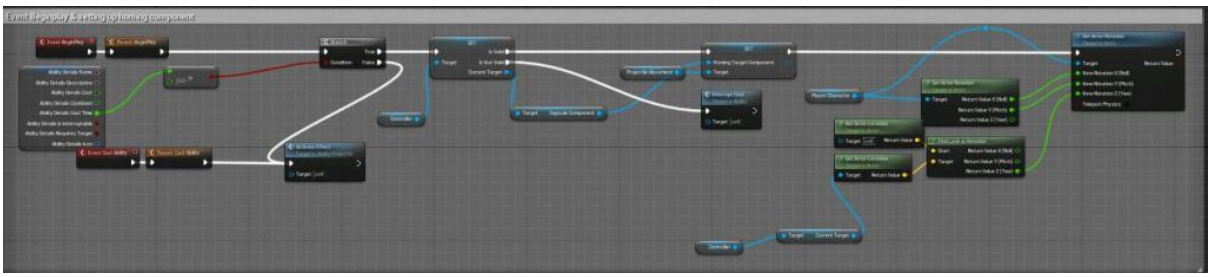




Spell abilities Development log progress #4.3

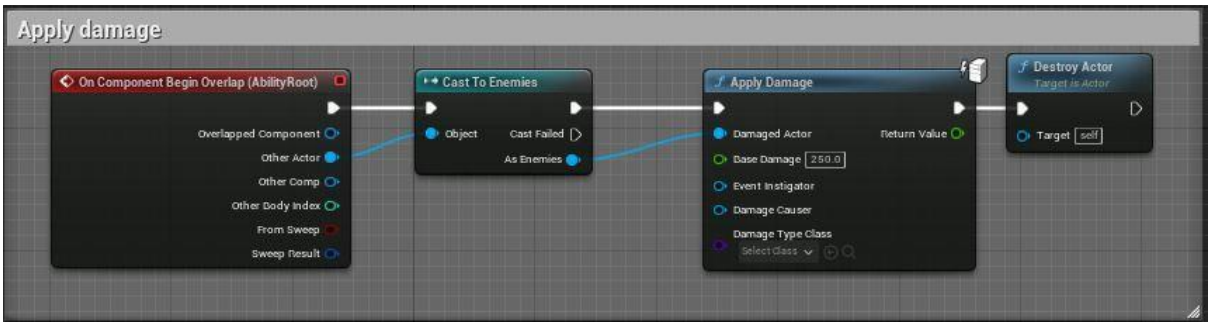
Ability Projectile/Fireball

Here I will be talking about my Ability Projectile childclass and it's child Fireball which all inherit from the parent ability blueprint, I will discuss what went wrong and worked well during the development of this.

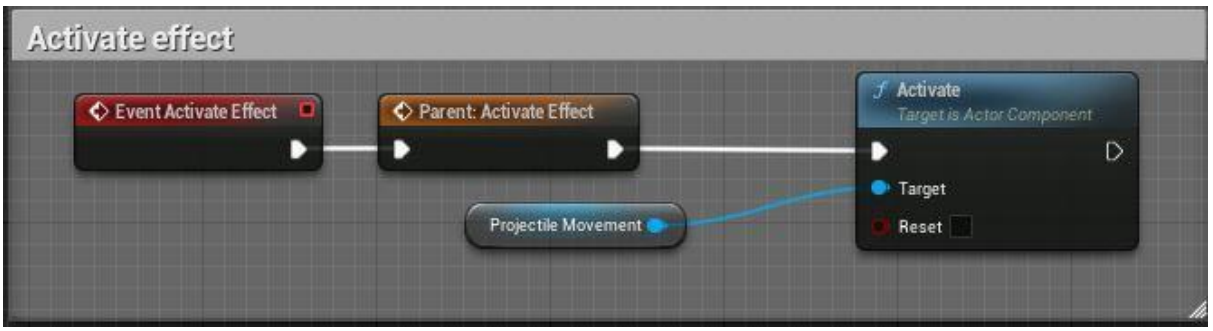


In this event we cast from the begin play event and then the parent which is the ability blueprint which then goes into a branch the condition being the ability cast time which is greater then 0, if false it will cast ability and activate the effect, then on true it will get controller, and if it's valid it will get the homing projectile component with the target being projectile movement, so that it can home onto the enemy target (using a target component which I will go into on a future post) and if its not valid then it will interrupt the cast. After its set the homing projectile it will set the actor rotation the target being the player character references (get actor rotation into the X & Y and then the Z will go into find look at rotation and then gets the actors location and goes into the current target linking into the post i will talk about with the enemies which is setting up a targeting system.

During this I faced a bug and issue which meant when I casted I could spam cast it which created multiple collision spheres and particle effects, to counter this I included the 'Get is valid' node so that if its' not valid it would interrupt the cast meaning you couldn't spam cast spells which created duplicate spells spawning, which was an efficient fix for my issue at hand. Comparing it to industry games such as World of Warcraft, I believe my fireball spell does well to replicate that style of combat and satisfying feeling however unlike in World of Warcraft an industry game they have a team of VFX artists who could create their own unique VFX spell effects, mine were used on the UE5 store however If I took this further I would love to learn to make VFX spells if my scope and timing was further extended, if enemies attack you in industry games such as World of Warcraft it usually interrupts or slow your cast down, this is something I would love to include further down the line however it isn't in the scope of my project currently.



This blueprint is in the child Fireball which parent is the ability projectile, this blueprint on begin overlap casts to the enemies then applies damage which is currently 250 and destroys itself afterwards, during this I had to balance the health of the enemies and the damage the fireball does, so that's its not too quick and easy making it boring to kill them but also so you don't do an absurd amount of damage and kill them quickly which has no challenge for the player and is boring.

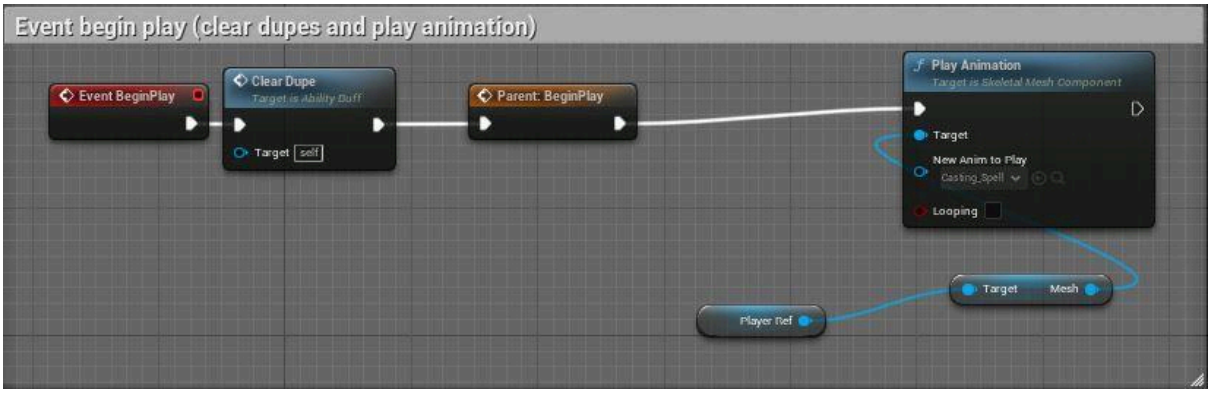


This activates the projectile movement in the projectile ability blueprint so that it can then use projectile movement to hit it's targeted enemies, using activate target is actor component.
The video below shows the fireball spell in action in my game where I attack a target testing dummy which does damage to them and launches a particle effect which ticks down their health and destroys them on death, I will go into the UI and the enemies in a separate post however I am fairly happy with how this spell turned out.

Spell abilities Development log progress #4.4

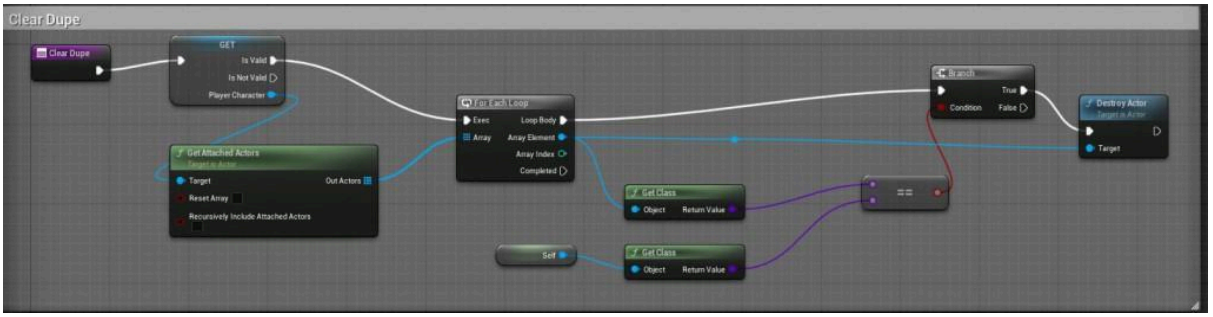
Ability Buff/Stamina

Here I will be talking about my Ability buff child class and it's child stamina which all inherit from the parent ability blueprint, I will discuss what went wrong and worked well during the development of this.



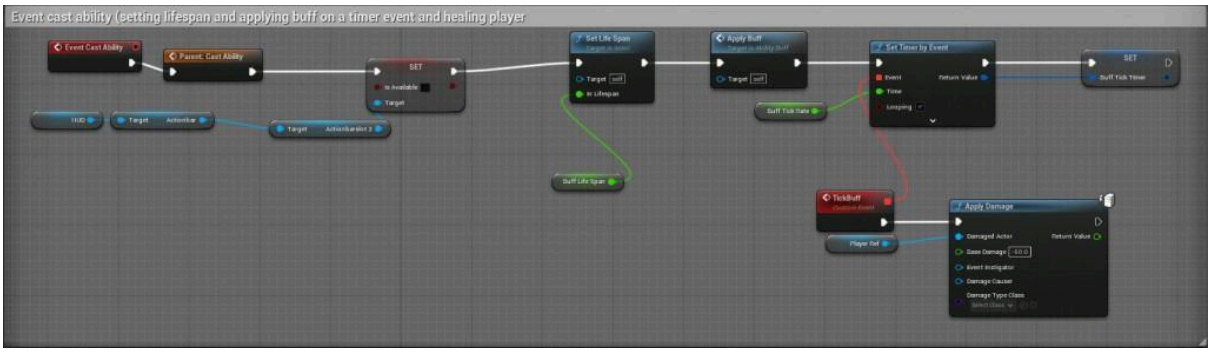
This is my begin play event in the ability buff on begin play before it calles the parent begin play from the parent ability blueprint actor it calls the clear dupes function which ensures that the ability buff doesn't dupe onto the character allowing them to spam healing buffs on themselves, at first this was an issue I ran into however after getting feedback from a fellow student and playing it myself, I noticed this issue and went to resolve it, which involved problem solving, so below will be a clear dupe function which I will go into. after the parent begin play it will play the casting animation which is attached to the mesh of the player character ref.

Below is my clear dupe function as mentioned above, this ensures that my buffs do not duplicate and it will clear them if needed, for this I get is valid node from it which means if valid it plugs into a for each loop node, which array is attached to get attached actor the target being the player character in this instance, after that the loop body connects to the branch node which if true destroys the actor and the condition that is plugged in is if it == the get class self and the array element it will stop it from duping and ensures there is only one buff in progress on the character. This overall fixed my duplication issue when I problem solved and iterated on this spell mechanic, which cleared all issues but took a few attempts to get it right and I finally feel it's in a polished position to function as intended.

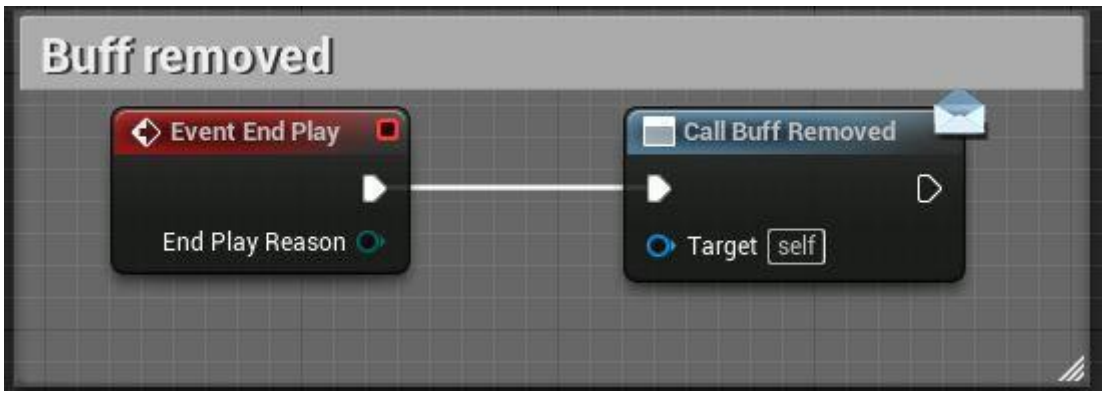


Below is my event cast ability which is where i will sett the lifespan and apply the buff on the timer to a player, from the event cast ability and the parent cast ability we get a set is available boolean to see if the spell is available to cast which target is the action bar slot 2 which connects to the parent action bar and then the HUD, which if so it will set the lifespan of the buff to my float 'Buff life span' which I have currently set to 3 seconds after testing to ensure its balanced and not too overpowered or weak however I will be having a retest of all these numbers in the final balancing stage after this it calls the event apply buff which then goes into set timer by event and goes into set buff tick time, the time is connected to a new float called 'Buff tick rate' which is how fast the buff will tick during its life span which is currently set to 1 second, however I could adjust this depending if i wanted it to tick loads to heal the player in the 3 second lifespan.

After this we go into a custom event from the event pin in set timer by event which applies damage to the player in this instance it's -50 so it heals by 50 for 3 seconds on a tick rate of 1. I did suffer an issue where the buffs life span was infinite but I fixed this after using the unreal engine debugging F9 tool which indicated that there was an issue with the stored variable, which after making on event end play and calling the event dispatcher buff removed it worked perfectly.



This final bit of blueprint is the buff removed in which on event end play it will call buff removed which removes the buff from the player to ensure it doesn't stay on them infinitely.



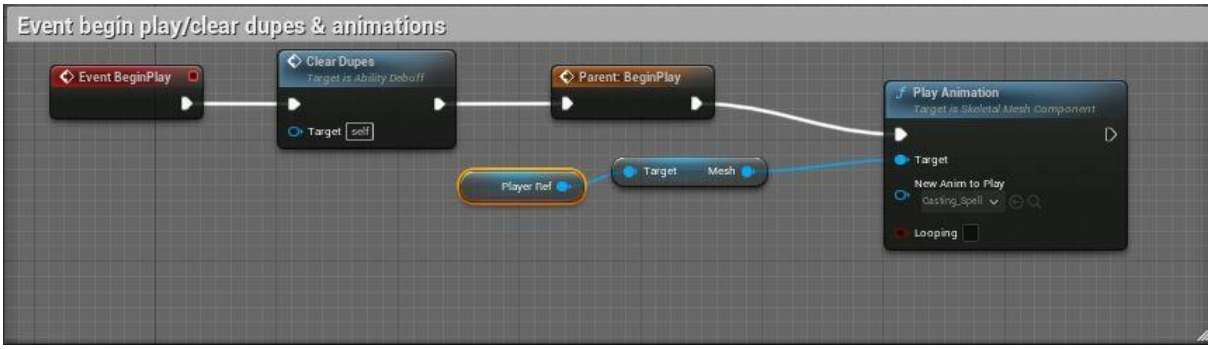
Comparing to how world of Warcraft and industry game has their buffs handled I critiqued myself and compared it during development, which gave me knowledge of what I could do to improve or add to my abilities, for example world of Warcraft, shows a UI above the player or with their new system it allows you to move it on the screen to your will, which shows you have an active buff on and usually the time and how much you are being healed or buffed, this is something I would do after university or if I had more time, potentially for GRADX.

This is a video of it working in game

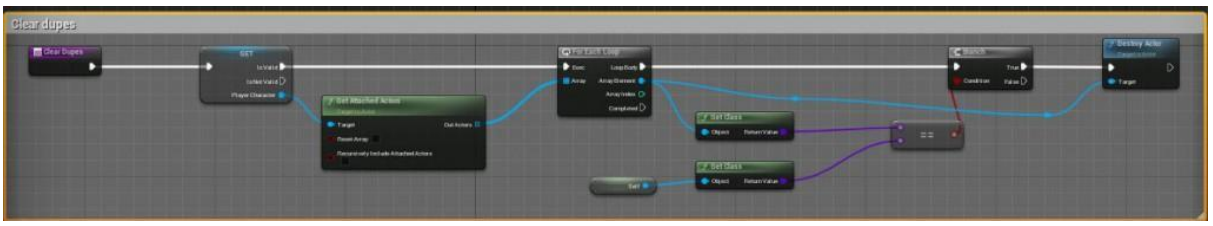
Spell abilities Development log progress #4.5

Ability DeBuff/Bleed

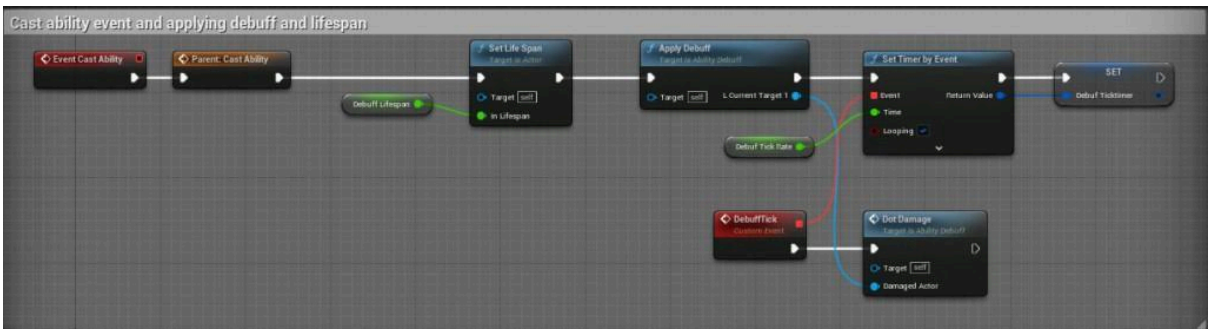
Here I will be talking about my Ability debuff child class and it's child bleed which all inherit from the parent ability blueprint, I will discuss what went wrong and worked well during the development of this.



This is my begin play event in the ability debuff on begin play which works exaclty how the buff begin play works with the same nodes, but to give context, before it calls the parent begin play from the parent ability blueprint actor it calls the clear dupes function which ensures that the ability debuff doesn't dupe onto the character allowing them to spam damage debuffs onto the enemies, at first this was an issue I ran into however after getting feedback from a fellow student and playing it myself, I noticed this issue and went to resolve it, which involved problem solving, so below will be a clear dupe function which I will go into. after the parent begin play it will play the casting animation which is attached to the mesh of the player character ref.

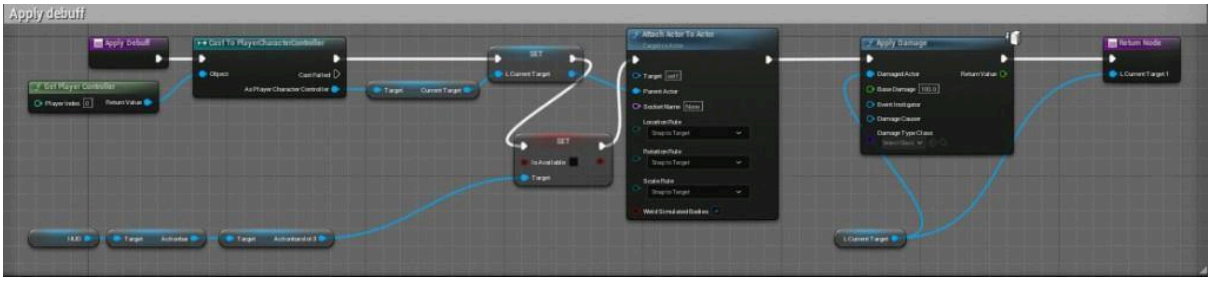


Below is my clear dupe function as mentioned above for buffs as this works the same however I will explain again, this ensures that my debuffs do not duplicate and it will clear them if needed, for this I get is valid node from it which means if valid it plugs into a for each loop node, which array is attached to get attached actor the target being the player character in this instance, after that the loop body connects to the branch node which if true destroys the actor and the condition that is plugged in is if it == the get class self and the array element it will stop it from duping and ensures there is only one buff in progress on the character. This overall fixed my duplication issue when I problem solved and iterated on this spell mechanic, which cleared all issues but took a few attempts to get it right and I finally feel it's in a polished position to function as intended.

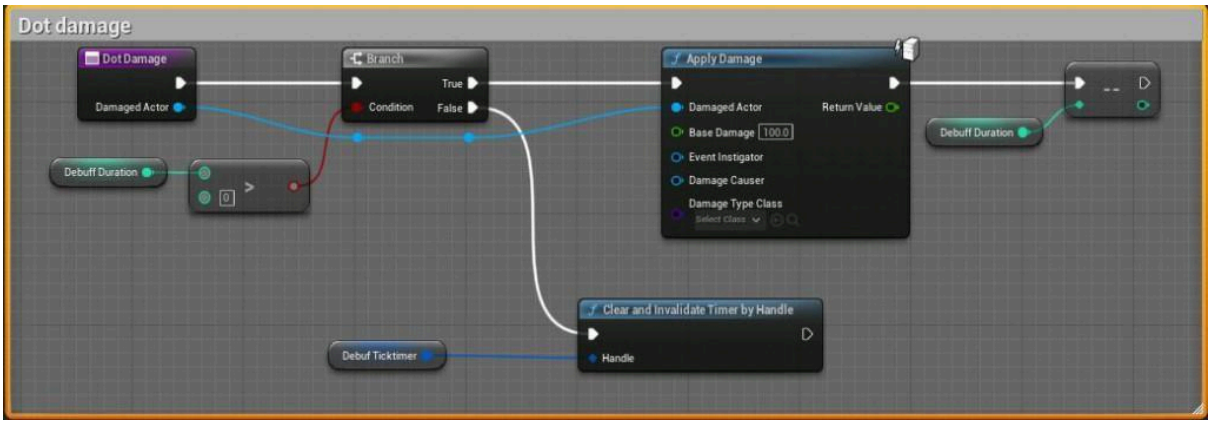


While mostly the same as my buff cast ability event, there are a few differences, Below is my event cast ability which is where i will sett the lifespan and apply the debuff on the timer to a player, which if so it will set the lifespan of the debuff to my float 'deBuff life span' which I have currently set to 4 seconds after testing to ensure its balanced and not too overpowered or weak however I will be having a retest of all these numbers in the final balancing stage after this it calls the event apply debuff which then goes into set timer by event and goes into set debuff tick time, the time is connected to a new float called 'deBuff tick rate' which is how fast the buff will tick during its life span which is currently set to 1 second, however I could adjust this depending if i wanted it to tick loads to heal the player in the 3 second lifespan.

After this we go into a custom event from the event pin in set timer by event which then calls my function called Dot damage which applies the dot damage which i will go into below,I did suffer an issue where the debuffs life span was infinite like the buffs lifespan but I fixed this after using the unreal engine debugging F9 tool which indicated that there was an issue with the stored variable, which after making on event end play and calling the event dispatcher buff removed it worked perfectly.



In this blueprint I apply the debuff, so from the function apply debuff we cast to the playercharacer controller and the object is the get player controller and from there we get the current target and set the current target which goes into a set boolean node, which target is actionbar slot 3 which goes into action bar then HUD for my widget UI, the boolean is also is available to see if it's available to cast from there we get attach actor to actor which is plugged into the parent actor from the set current target, the enemies have target components set onto them which I will go into on a future enemies post in my development log, after that it will apply damage which i balanced to 100 currently which is subject to change on final balance and polish, the damaged actor is current target reference which goes into a return node that has an output of current target.



This is my DoT damage blueprint which is the function that applies the damage to the enemy, from dot damage with an input of damaged actor, it will go into a branch and on the condition it is greater than node, plugged into an integer which is the debuff duration which is set to 5 seconds which controls how long the debuff lasts, after the branch if it's false it will clear and invalidate timer by handle and the debuff ticktimer from the cast ability so it doesn't error out and lets you cast it again, and then from true it will apply 100 damage to the damaged actor which will go into a subtract 1 node, which subtracts 1 from the debuff duration.

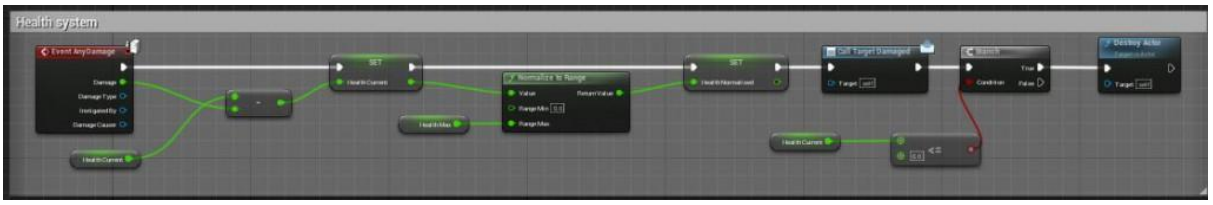
Comparing to how world of Warcraft which is an industry game which have their debuffs handled, I critiqued myself and compared it during development, which gave me knowledge of what I could do to improve or add to my abilities, for example world of Warcraft, shows a UI above the player or with their new system it allows you to move it on the screen to your will, which shows you have an active debuff on and usually the time and how much you are being damaged or debuffed (for example a slow debuff), this is something I would do after university or if I had more time, potentially for GRADX, this is very similar to my debuff, both blueprints are ultimately varies similar with a few changes due to how they operate one is doing damage or adding a negative effect while the other is healing or beneficial.

This is a video of it working in game

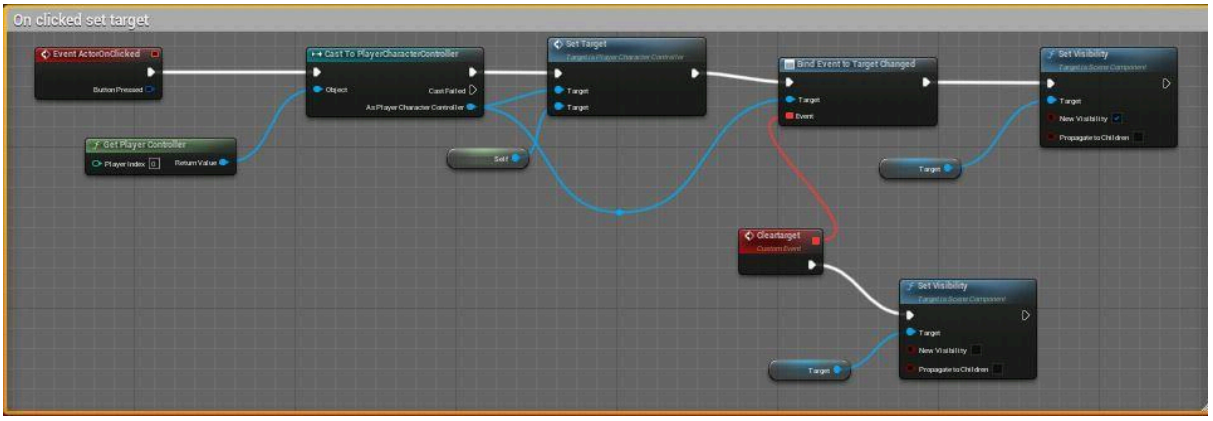
Enemies & current target Development log progress #5

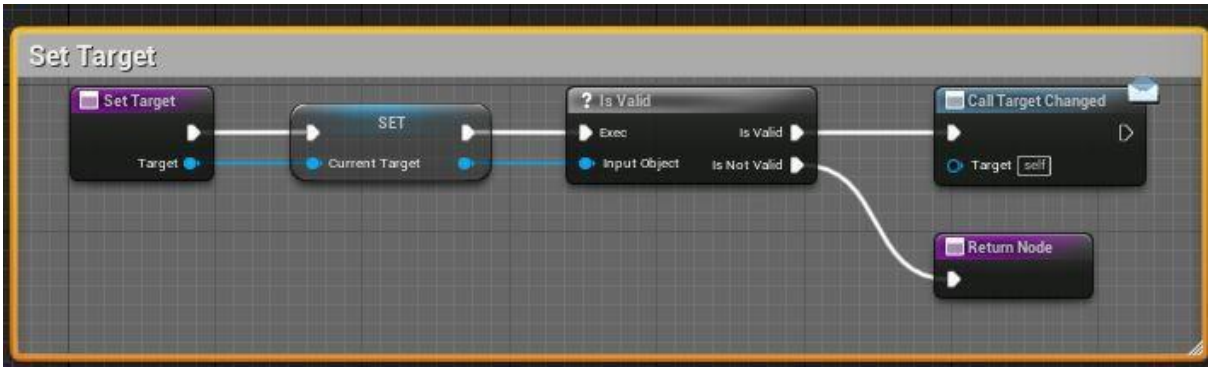
Parent Enemies & Child bandit enemy

Here I will be talking about my parent enemy class and it's child class which is the Bandit enemy, I will discuss what went wrong and worked well during the development of this.

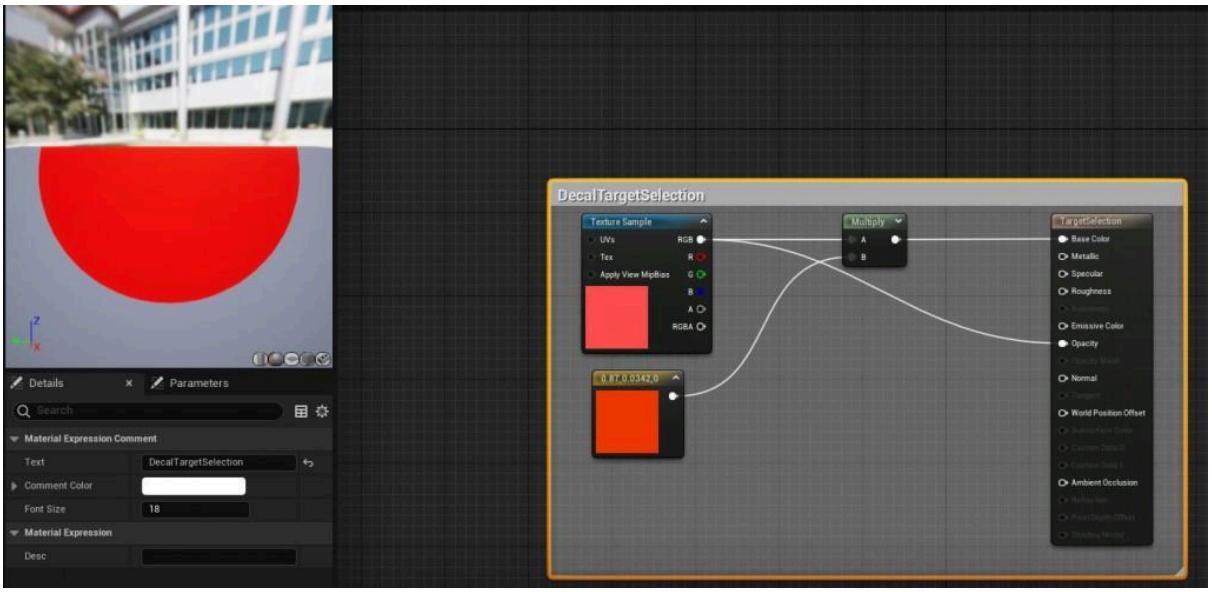


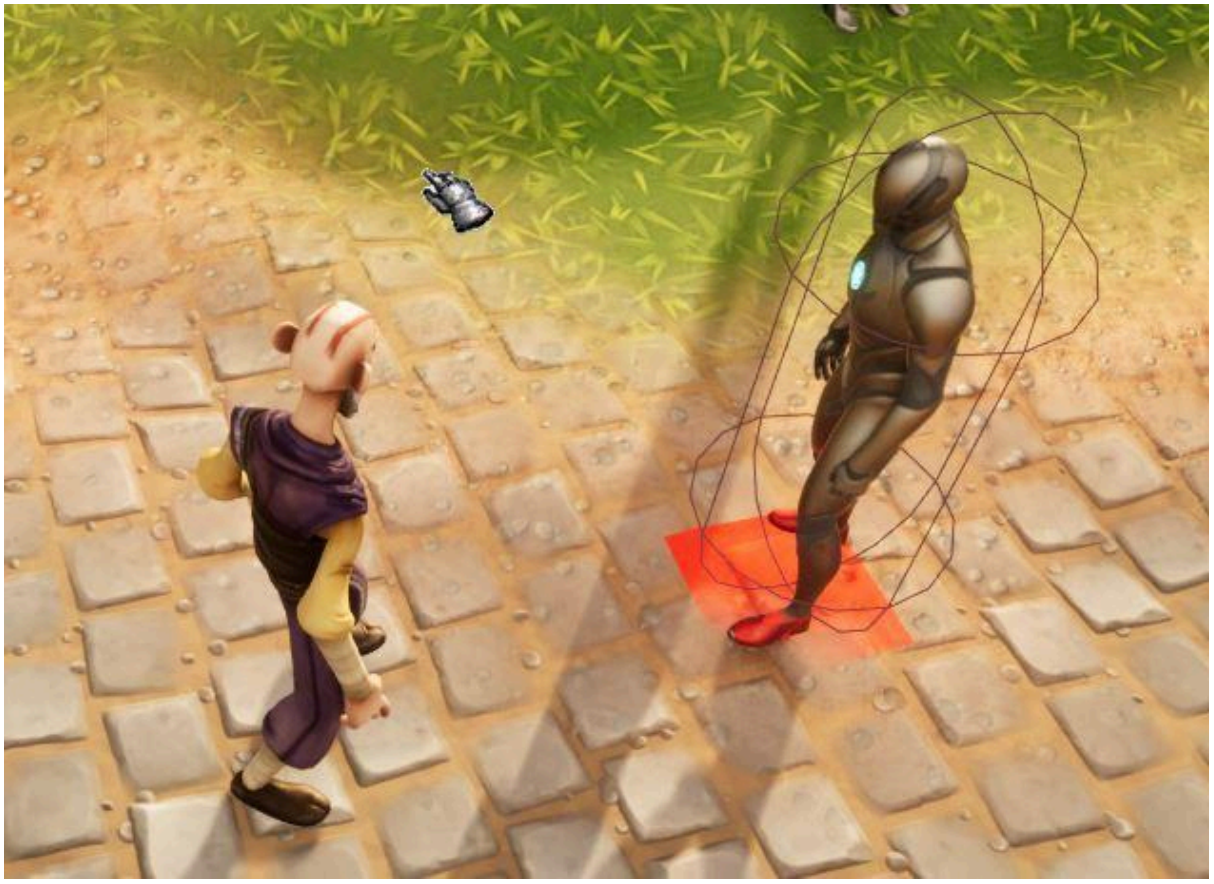
This blueprint is in the Parent enemy class and it holds the event any damage event which is used to create my enemies health system, from the execute pin in event any damage it goes into a set health current which it's left float pin is connected to subtract which goes into health current float and then damage, after this on the execute pin for set healthcurrent it goes into set health normalised which holds the normalised heath value which my enemies will be, so the left float pin goes into normalise to range, the value being the health current which connected to the set health current and then the range max being the max health the enemy can have, after the set health normalised it calls the target damaged event dispatcher then goes into a branch which the condition is if its less or equals to 0 it will go to true on my branch and destroy actor. I have balanced the standard health current to be 1500 and the max health to be 1500, i will adjust this in final balancing but for now it seems to be reasonable with my spell ability damages.



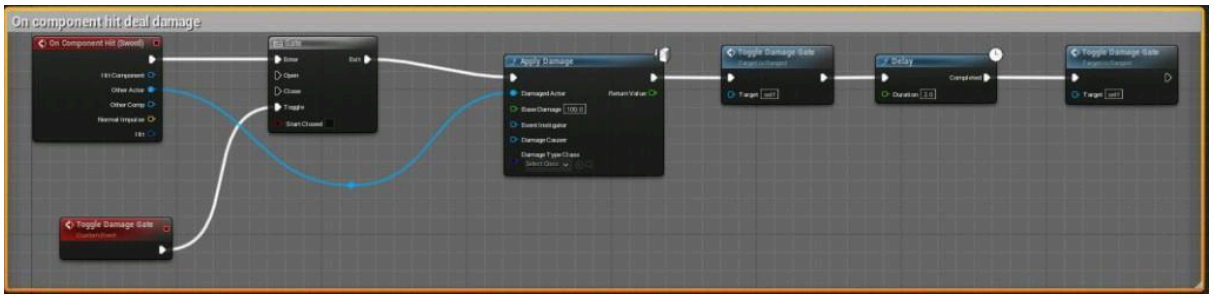


The event ActiononClicked is in the parent enemies class which from the execute pin in the event it will cast to the player character controller which is plugged into my player controller so it can grab the reference needed from player character then call the event from the player controller and self called Set target, after this it binds the event to target changed and sets the visibility to true on the target. However on my bind event the event goes into a custom event called clear target which sets the visibility to false on the target therefore meaning that if you click on the target it will show the target selected however if you click another target it will hide the marker. The event it calls for setting target is held as a function in my player character called set target, with the output node being target which sets the current target reference and then checks is it valid (node) if valid it will call target changed if not valid it will return it.

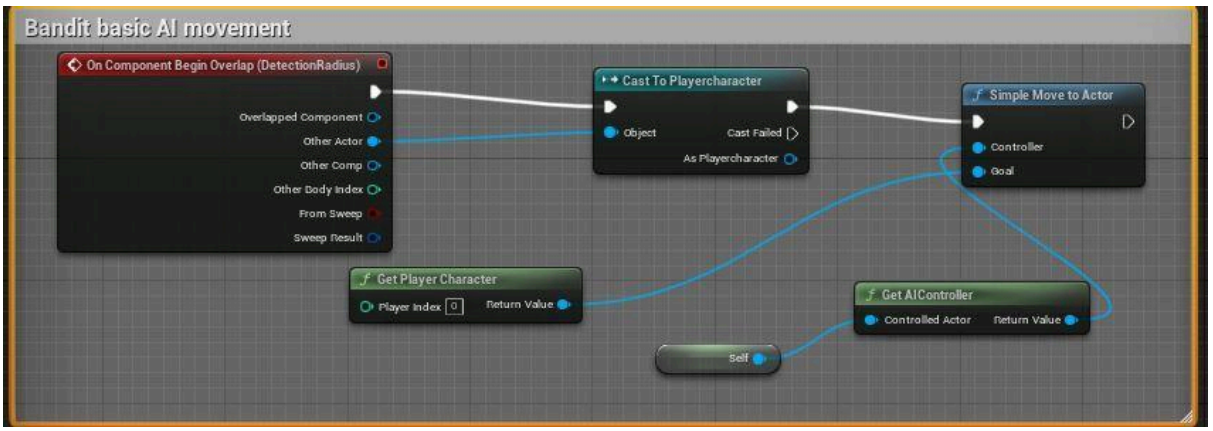




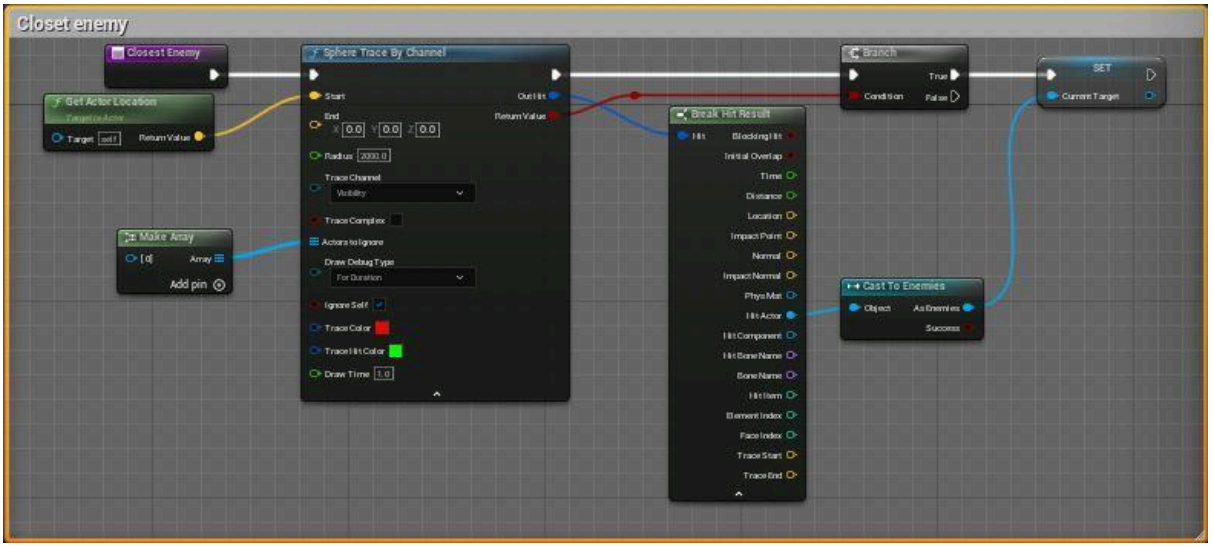
This is the decal I created for my current target, it has a texture sample with my ring texture inside of it then from RGB it multiples it to the base colour and from the colour node which is red it will multiply into the base colour, the texture sample also plugs into the opacity so that it has a slight opacity.



In my bandit child class from the parent enemy class, I have a on component hit event for the sword mesh, which has a gate, on the toggle execute pin it has a custom event called toggle damage gate so that on the exit of the gate node, it will apply damage being 100 and then toggle the damage gate and set a delay which then it will turn back on the damage gate, this allows for there to be a slight cooldown on the damage so it can't constantly damage you, which led me into issues where the player would die to fast due to the incoming constant damage.



This is my first iteration of my Bandit enemy AI movement, which I intend to iterate into a full behaviour tree as I have encountered a few issues with this first iteration, as on component begin overlap of the detection radius it casts to the player character which plugs the object into other actor so it only focuses them instead of any other actor, it goes into a simple move to actor function which on the controller gets the AI controller and self and then on goal the get player actor, which while it works it isn't efficient and doesn't fully work as intended as once the AI reaches the goal they hit the player and then stop until the player renters the radius by leaving it and walking back into it, i believe i will fix this using a behaviour tree in my final iteration as it will allow me so make a more complex AI to either constantly attack the player or move when the move to follow them. I also had an iteration of the targeting system where instead of clicking on the enemy you could press the keybind 'tab' and it would sphere trace the enemy by channel and get the actors location on the start and make an array, from the execute of the sphere trace it would make a branch and the condition would be the return value, on the true of the branch it would set the current target reference and then cast to the enemies and plug into the hit actor on my out hit break hit results, however this ultimately faced a lot of issues as it wouldn't properly target my enemy actors and involved changing a lot of the in game mesh actors as it would sometimes target them, the clicking on targets last iteration solved the issue I was having and made for an efficient easy way for the player to target their characters.



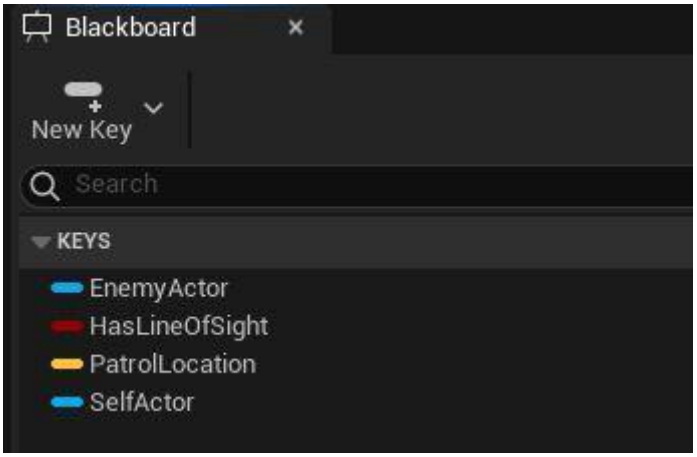
When comparing this to other games theres a few which have a targeting system as in the MMORPG industry and some RPG's they have a tab targeting or click to target system on the enemies for example World of Warcraft, Star Wars the old republic and Divinity original sin 2, these heavily inspired the way I wanted to craft my combat system, as I really like the fact you can just click on the enemy to target them and have your character attack them. I would say that i did look at my targeting system compared to these games to see what I could improve or critique myself on and honestly theres a lot I could do to make it far

better, for example if I clicked a character it could put a faint red border around them perhaps omissive effect to to greater signify they were an enemy.

Enemies AI Development log progress #5.1

AI enemy behaviour trees iteration from basic ai blueprint

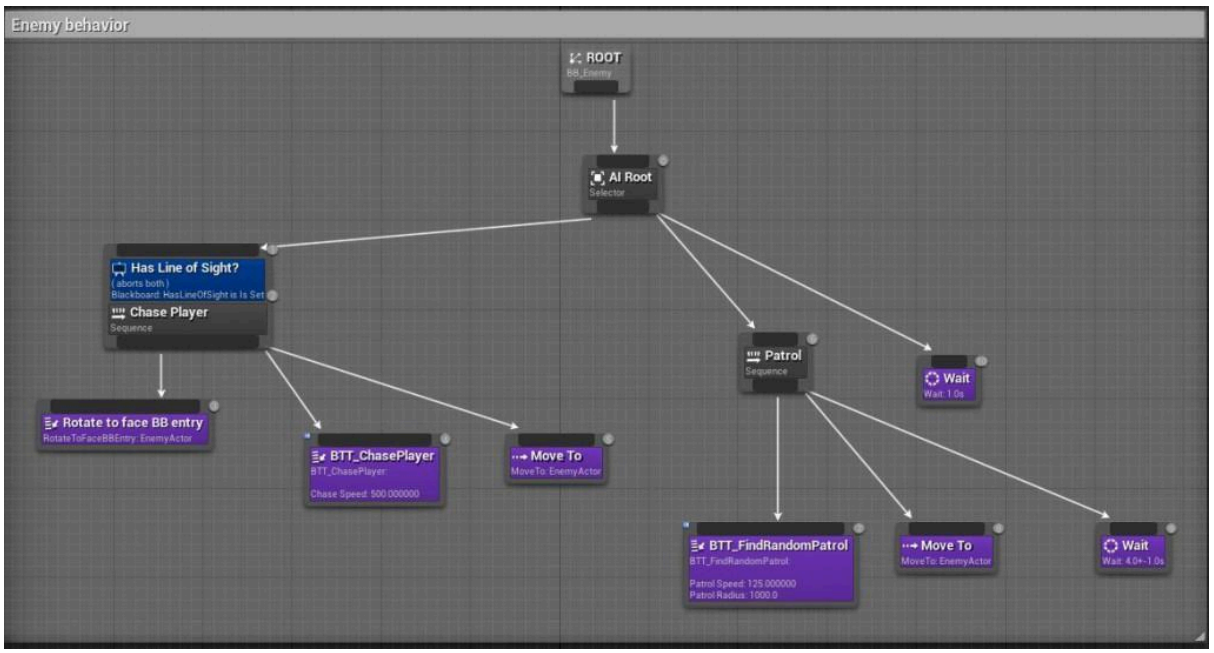
Here I will be talking about my enemy AI iteration where I move to use behaviour trees instead of basic AI blueprint held within the enemyI will discuss what went wrong and worked well during the development of this.



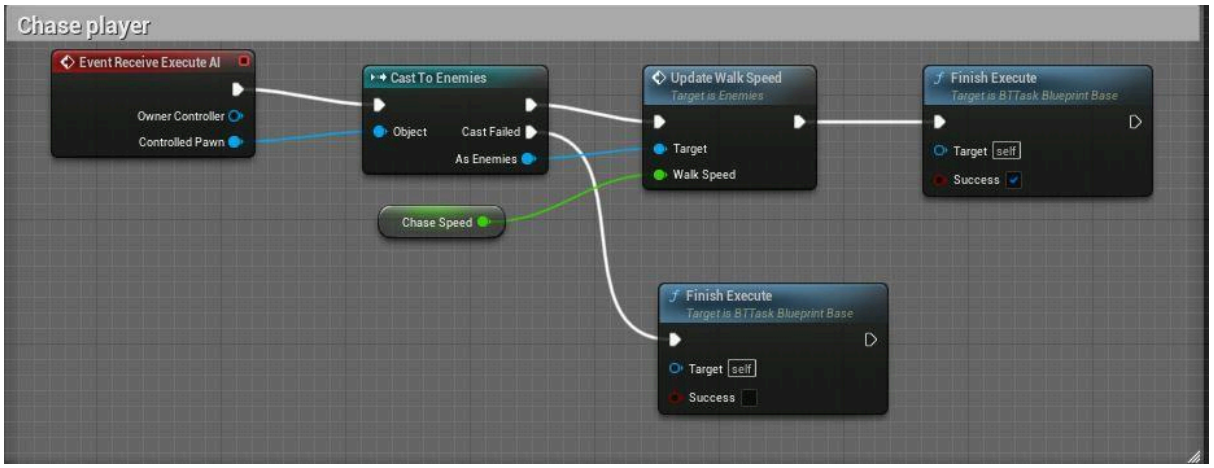
Firstly I created a blackboard which is used to store all the data for my specific behaviour tree and AI controller, in this I included four variable keys 'Enemy Actor' which refers to the enemy, 'Haslineofsight' so does the AI have a line of sight on the player and then 'Patrol location' vector which stores the location the AI can patrol and then 'Selfactor' which gets itself.

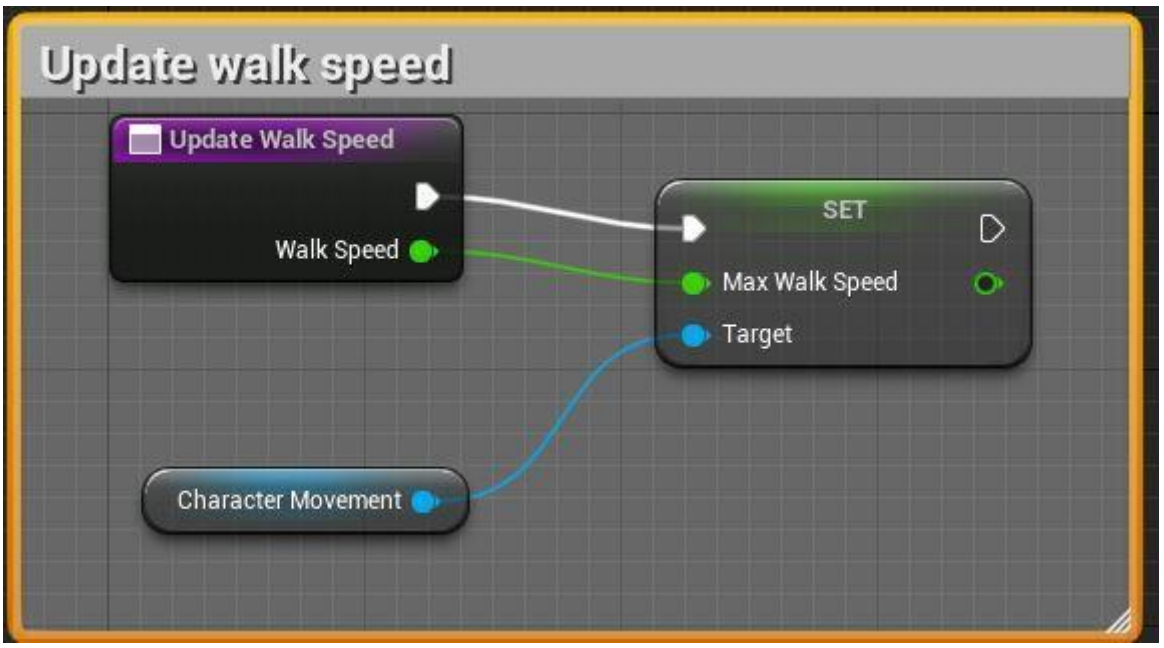
Next I created a behaviour tree for my AI where from the ROOT i dragged out to create a AI root selector and from there I made a chase player sequence which will be the area where I hold all the data for the AI to be able to chase my player, this has a decorator on it which basis its condition on one of my blackboard keys this one being 'has line of sight' after this it then plugs into rotate to face BB entry so it rotates the enemy actor then it will go to my BTT chase player which will set the speed for it to chase the player and then a move to so it moves to the players.

The next sequence to come of the AI root selector is Patrol which is where the AI behaviour for patrolling is handled firstly it goes into BTT_Find random patrol which is where the data is held on where the AI can patrol after it will move to that location and then wait for 4 seconds + 1.

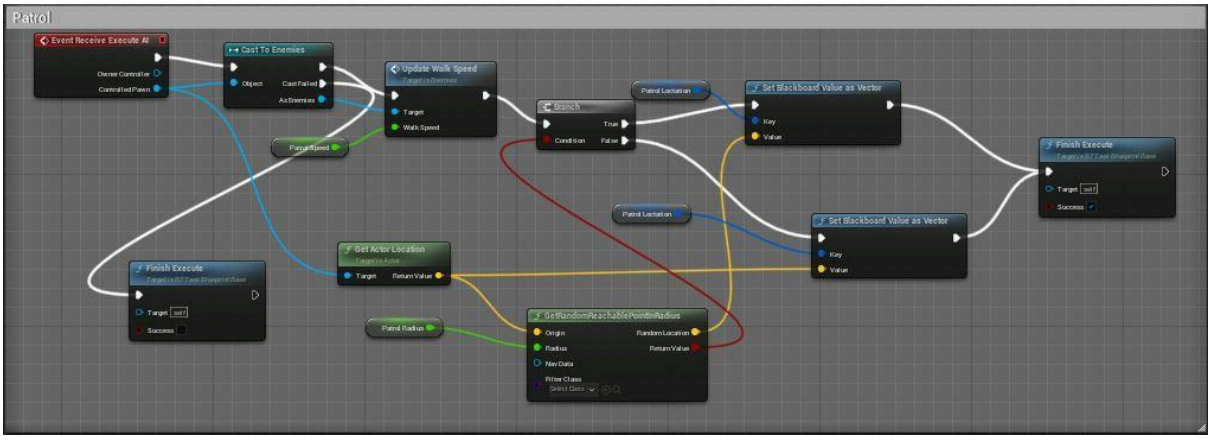


This is my chase player blueprint held within the BTT_ChasePlayer which on event receive execute AI it will cast to enemies and then updates their walk speed by calling the event from the enemies which is a function called Update walk speed this contains set max walk speed (float variable) which then plugs the target into the character movement of the enemy. After the update walk speed event it will call the finish execute function on a success true to show it's successful if it fails it will finish execute but with success set to false. the chase speed is a float which is instance editable so I can easily balance and adjust this if needed





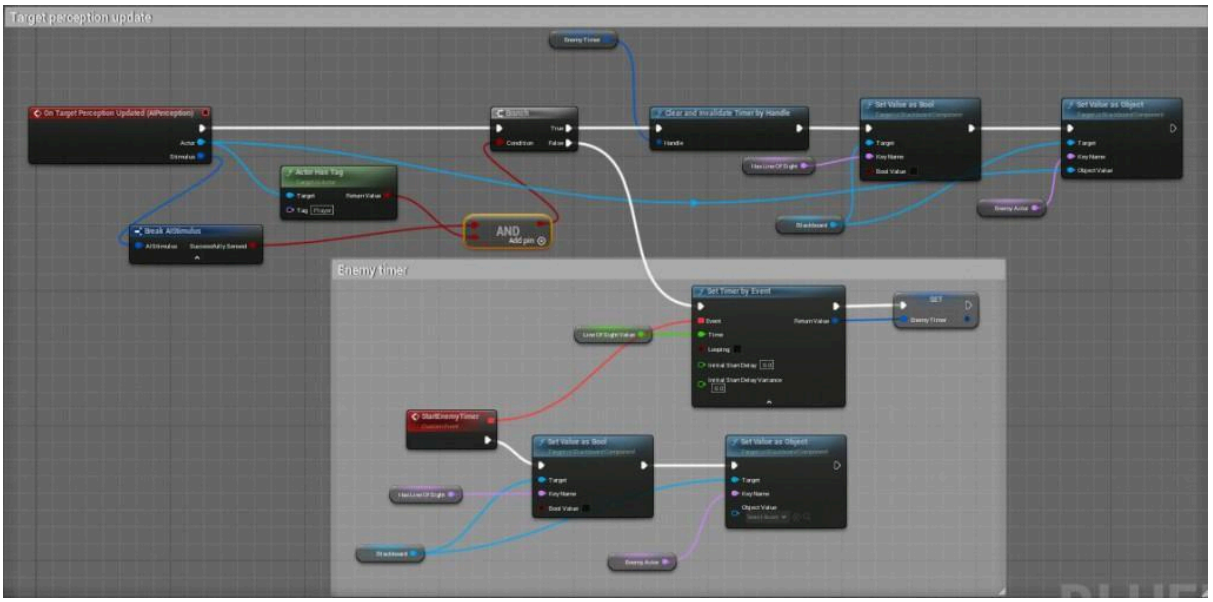
Below is my patrol blueprint which is held in the BTT_Find random patrol, firstly it will do event receive execute AI which will cast to my enemies which on failed it will finish execute success false however if true it will do what the blueprint above did and update the walk speed however the float walk speed will change to patrol speed as this will be differn't to the chase speed as if you are patrolling you want the enemy to walk at a slow pace whereas if the enemy is chasing you it will be faster. after the execute pin we go into a branch where the condition is set to get random reachable points in radius where the origin is the get actor location which is plugged into the event controlled pawn pin and the radius is a custom float called patrol radius which is the radius the AI can patrol in, from random location we get set blackboard value as a vector with the patrol location variable key plugged in which is also connected to the true execute pin of my branch and then if false we get set blackboard value as vector with the patrol location in and the value is connected to get actor location. after both of these set blackboard nodes we go into a finish execute which has success set as true.

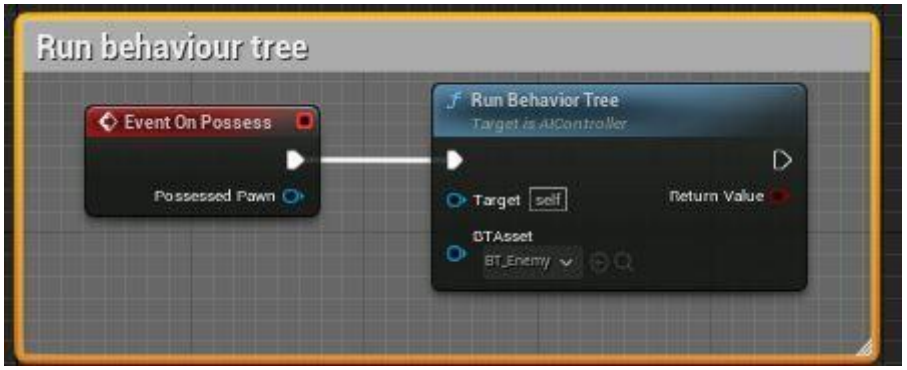


Below is my AI controller blueprint which on target perception updated it will break AI stimulus on the stimulus pin and then go into an AND node which is connected to Actor has tag (tag being Player which is set on the player character) that goes into the events actor and is also plugged into the AND node, after this the AND node is plugged back into my branch condition so that the AI will only go for condition which is the player character with the player tag and not any other actor. if this is true it will clear and invalidate timer by handle for the enemy timer variable, and plug into a set value as bool with the target being the

blackboard and the keyname Has line of sight?. After this the final node on the true side of the branch is the set value as object which target is the blackboard and the they key name is enemy actor.

However on the false side of the branch it will plug into a set timer by event which is connected to a SET node for enemy timer which we use above in the true branch to clear and invalidate the timer handle. The time pin is connected to a custom float variable called line of sight value which sets how long the line of sight lasts, and from event we plug into the custom event called Start enemy timer, which then sets the value as bool which is plugged into target blackboard and keyname line of sight? and then goes into the set value as object with target being the blackboard again and the enemy actor for the key



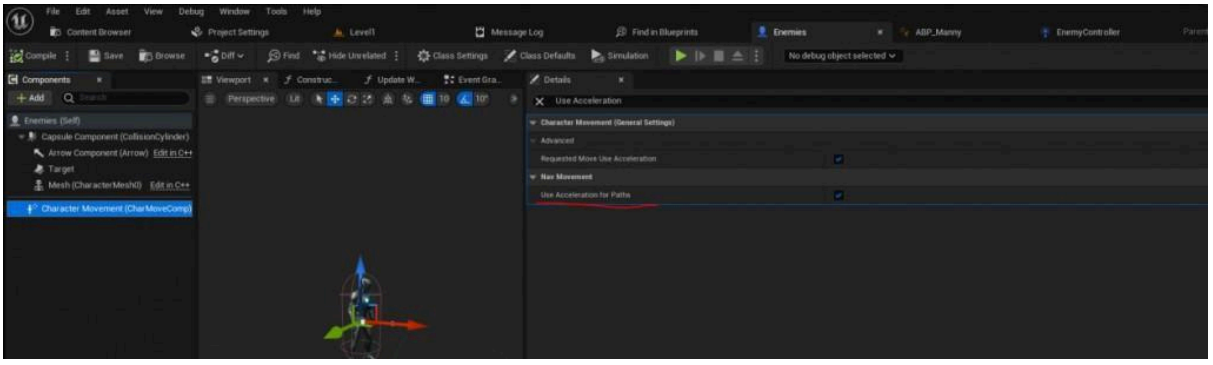


My AI was inspired by how many RPGs and MMORPGs have it with my key examples being World of Warcraft, Witcher 3 and Skyrim, where the AI is by far way more advanced but if I had the industry team and budget and wasn;'t working solo I would defiantly take advantage of it, however as my game is a verticle slice this is a small taste of what it could be. Usually in industry games like world of warcraft you have patrolling AI who will patrol an area and when you enter a certain radius or line of sight if they are melee they will chase after you to attack you, if ranged they will shoot from far. This is really where i got my inspiration of how I want my enemies to be, and when I reiterated on my previous version of the AI i find this new version to be much more efficient as behaviour trees you have lots of options to make a lot of differn't behaviours for AI whether enemies or friendly NPCS,. As in my first iteration of my AI, one they reached the player they would stop and not refollow you with you moved away which didn't work how it intended so after some problem solving and research I ended up going with using behaviour trees and blackboards while learning about them in the process.
(https://docs.unrealengine.com/4.26/en-US/InteractiveExperiences/ArtificialIntelligence/BehaviorTrees/BehaviorTreeQuickStart/) I would love to take this further for either GRADX or in my personal time,

however if this was a bigger budget game and not a verticle slice game, I could see the AI going far more advanced with the AI. I was also given advice by a fellow student who I can't name due to the ethics form, about using behaviour trees after showing them my original iteration of my AI blueprint this feedback was really valuable and helped me to push in creating a far better AI using behaviour trees and AI controllers.

Below is the a video of my behaviour tree AI in action (the animations and models will be added)

After some problem solving I realised the reason why my enemy AI didn't have animations working when I applied the default EU5 ones was because I had 'Use acceleration for paths' not ticked as default for my enemies movement component, which I fixed by ticking this. Below is a video of it working!

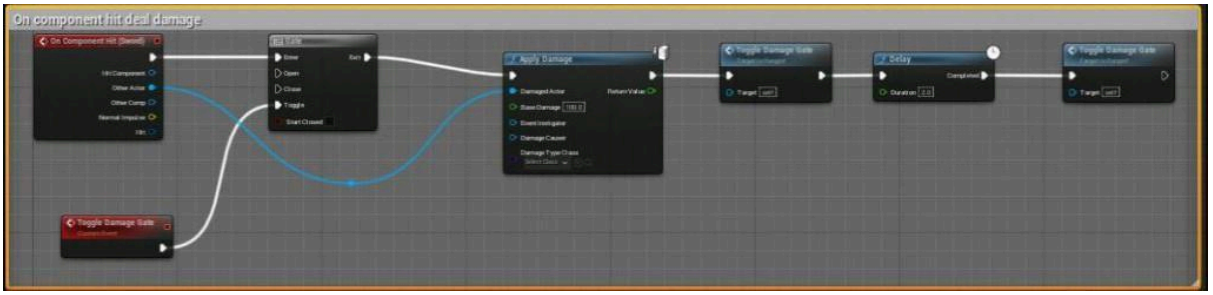


Enemies Development log progress #5.2

Problem solving and iteration for my enemies attack

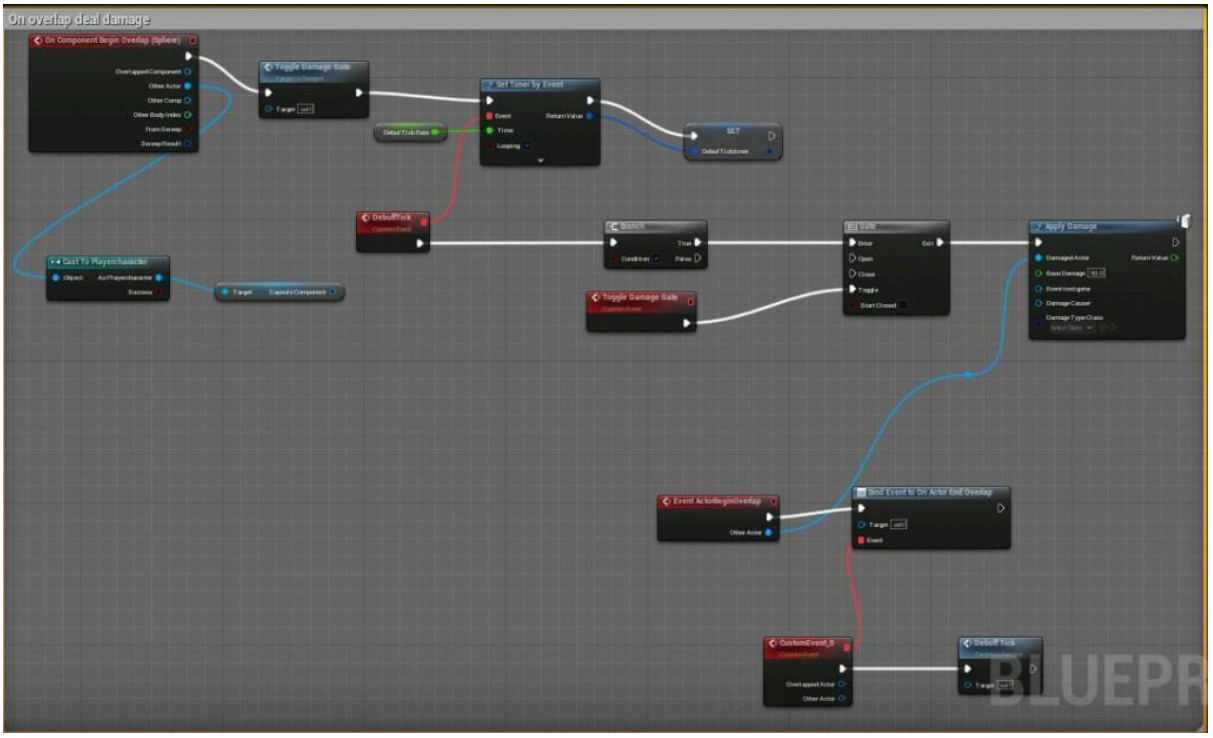
Here I will be talking about my enemy attacking problem solving and iteration where I solve the issues i faced with the enemy attacks, I will discuss what went wrong and worked well during the development of this

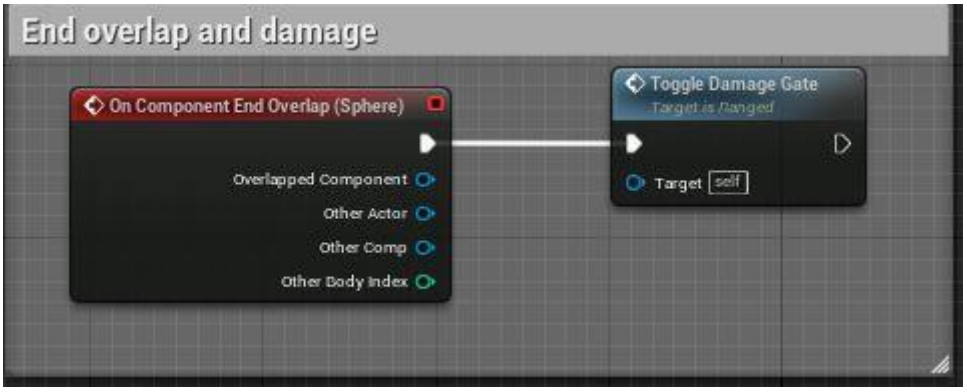
This is the old version of my bandit enemy attacking damage blueprint, which in principle works however it requires the player character to move into the enemy so the component hit works which ended up leaving the player not taking damage, for this I used a gate node as explained in the enemy development post, this is something I still use in the new iteration of my enemy, my thought process when wanting to reiterate to a better working blueprint for this feature was, do I want my character to be damaged regularly on a timer when inside the overlap collision or do I want it to hit once and that's it until I move into it, after looking at other RPG like World of Warcraft, Witcher 3 and so on they tend to constantly hit the player when close, whereas my current implementation works in principle doing damage however you have to move into the hit component mesh to get it to properly work which is flawed compared to the industry style games.



This is my new blueprint in the enemy character which I changed from on component hit to on component begin overlap (sphere) which I found using the sphere to be far more efficient in hitting the player and not causing camera issues. from the event other actor we cast to the player character and the capsule component so that it will only effect the player, then from the execute pin we will call the custom event toggle damage gate so it turns on then go into a set timer by event with a return value of a variable called debuff ticktime (which I will change to damage ticktime) then from time we have debuff ticktime which I will rename to damage tick rate variable for easier naming conventions. after this we go from the event pin and create a custom event called debuff tick which I will rename to damage tick (debuff was for testing purposes) after this we go into a branch with a condition of true, then if true we plug into the gate, with the toggle being a custom event called toggle damage gate which we called earlier on the exit execute pin we plug into apply damage which I have set as 50 for balancing however this might change during final polish, from damaged actor we go into a custom event called event action begin overlap and then plug into bind eventon actor end overlap which is where we end the overlap and call a custom event which will call debuff tick custom event again. The custome event will be renamed to recall damage event.

We then have a custom event called on component end overlap call toggle damage gate so that the player doesn't take anymore damage so it closes our gate.



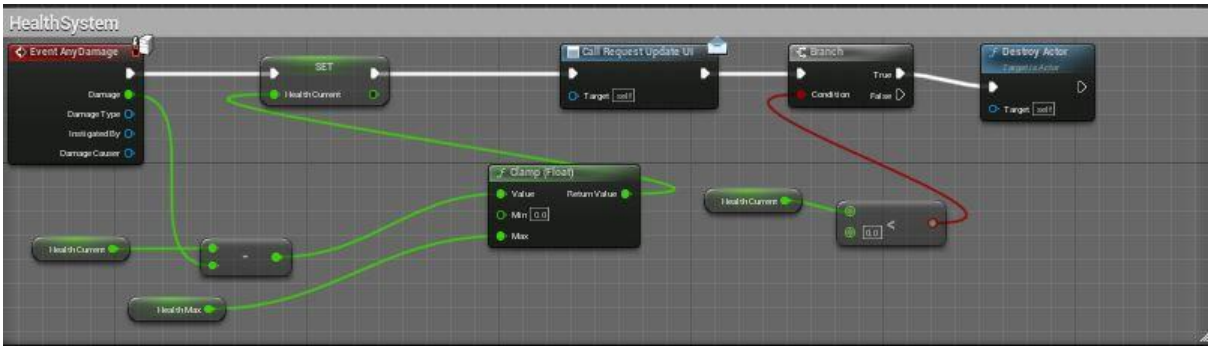


Below is a video of this working in my engine, overall I am happy I managed to problem solve a better fix for my damage system caused by the enemies and it makes it closer to industry games like World of Warcraft, however i currently have no attacking animations however I will look into getting these during the polish of the game. It overall works a lot more efficiently and how I wanted it to than my previous blueprint which worked in principle but had underlining issues which cause problems, overall I am happy with this iteration of it.

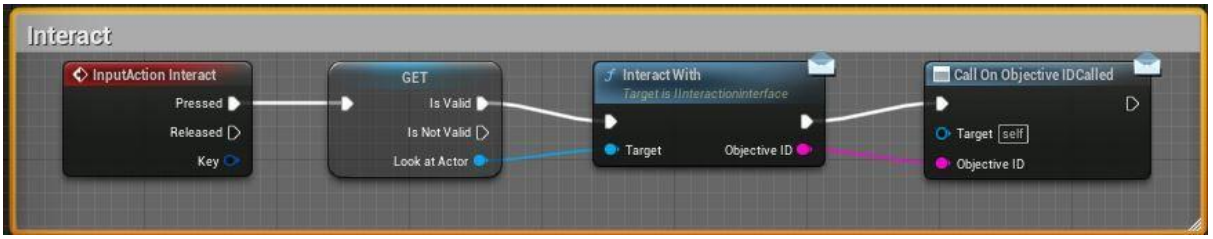
Player character development log progress #2.2

This post I will be talking about the development updates for my player character blueprint including problem solving and iterations.

Firstly I reiterated and problem solved onto my health system in the player as I encountered an issue which allowed my healing spells to heal above the max health which was an unintended issue for example you would go from max health of 1500 to 1550 up which wasn't good, therefore I decided to use a clamp float function node which plugged into my set health current and subtract node, which replaced the health normalised set and normalised range node.

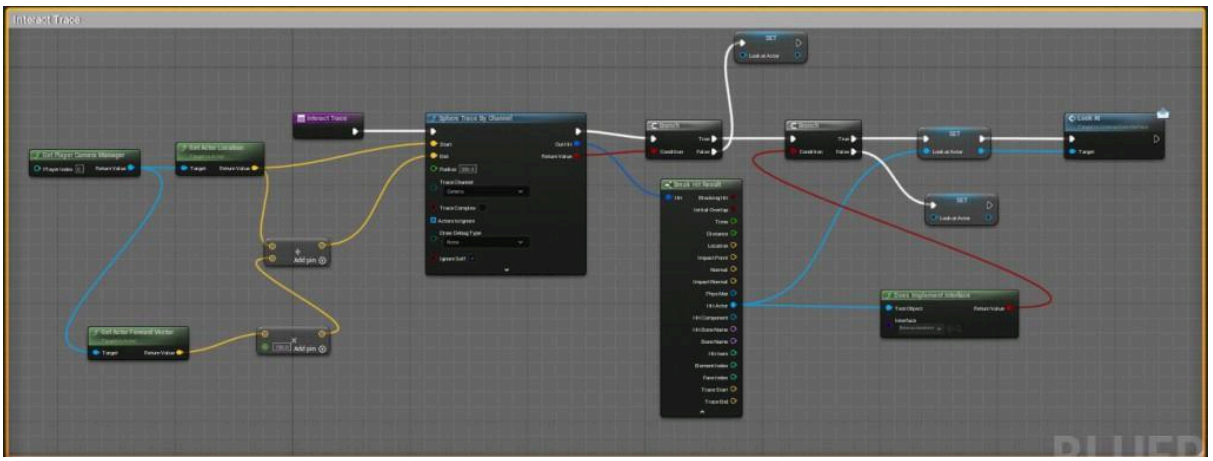


This is my interact event inside of my player character which the action input is bound to E on the keyboard so when input action interact (E) is pressed it will get is valid and look at actor then call the function interact with and call on objective ID called from the interact with which gets the objective ID so that when it correlates with the quest objective it will make sure the item you interact with is the correct objective ID



This is my interact trace function blueprint where on interact trace it will go into sphere trace by channel where on the start it will grab the actor location which target is player camera manager (my boom camera) which then goes into the get actor forward vector and multiples the vector by 150 and plugs into an add node which is connected to then get actor location node and then plugs into the the end node on the sphere trace by channel, I was using a line trace however this wasn't working correctly in a third person character so I moved to use sphere by trace which works as I intended leading me to problem solve. after the sphere trace by channel we go into a branch where on false it will set look at actor and on true it will call a branch again, where on true it will do set look at actor and then call the event look at from my interaction interface, if false it will set look at actor.

On the true look at actor before the lookat event, the look actor plugs into my break hit results into the hit actor which is also plugged into the does implement interface which is the interface interaction and is set to the branches condition.



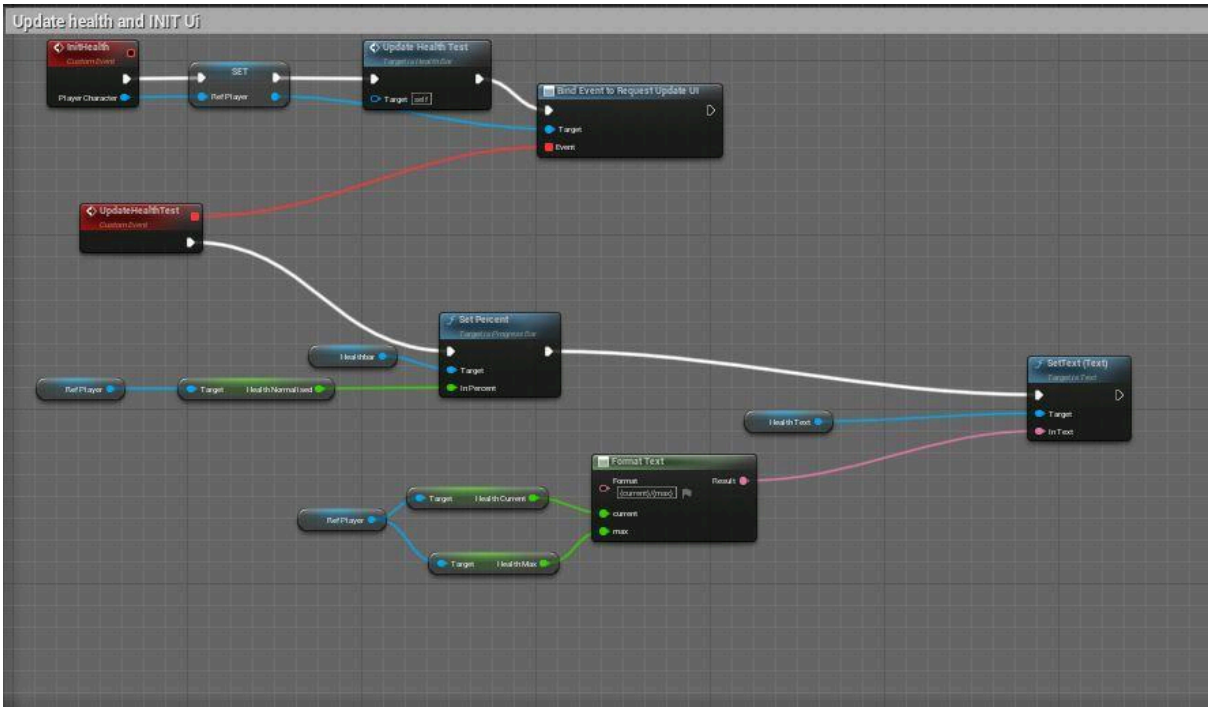
Below is a video of the interacting working. Industry games usually have the player interact like this with the usually key binds of 'E' for example like Skyrim or Witcher 3 however world of warcraft makes you right click them to interact this is something I chose not to do due to time constraints.

Widget UI Development log progress #6

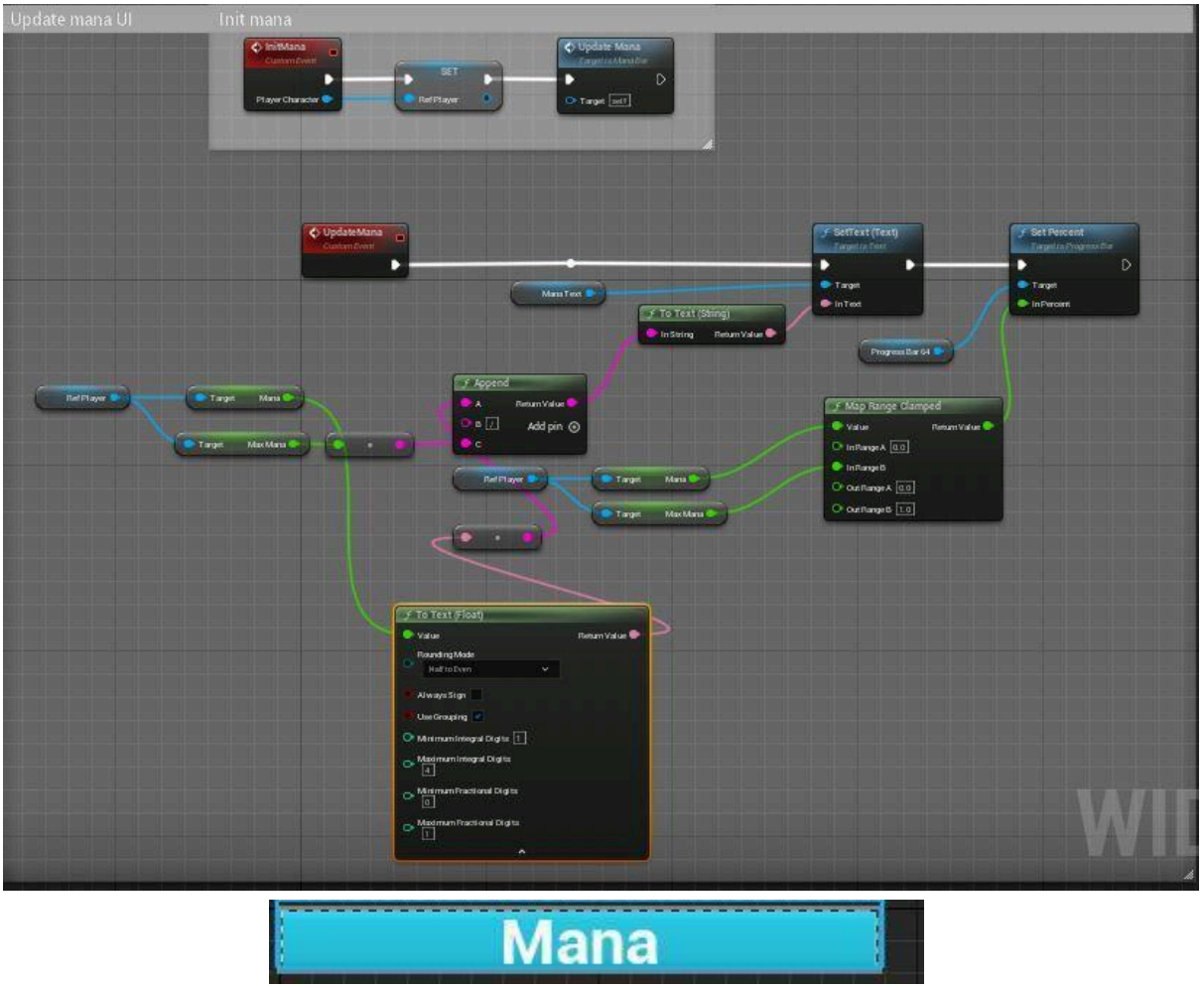
Widgets User interfact

In this post I will be talking about the development process of my widgets I used to create my games user interface and experience what went well and what went wrong.

This is my update health widget event graph this is where I update my characters health so it displays on the widget, from the init health custom event we set the player reference and call update health test then bind event to request Update UI, from here we go into the event update health test from the event pin and plug it into a percent function where the target is health bar and the inparent is health normalised and target is ref player. from here we go to set text and target is health text from here we format the text with the format being {current}/{max} so it gets your current health / max health with the health current float being plugged into current and health max in the max pin both of these are connected to the player ref.

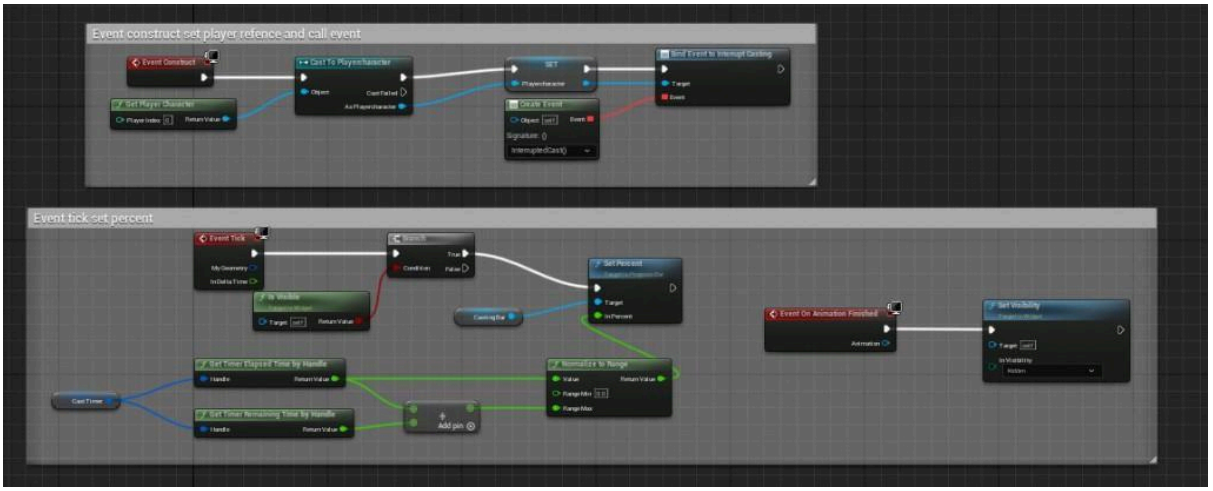


In this blueprint I set the mana updating to the widget bar, firstly we have an initmana custom event which sets the player reference and then calls update mana, which from update mana custom event we set text with target being mana text and then intext is to text string which is plugged into an append with A going into a to text float and then B is a / and C goes into Max mana which is connected to player reference and we have mana which plugs into to text float this sets the digits that will appear on the mana bar as I had an issue where it was showing multiple digits which looked weird and untidy and no industry RPG game like World of Warcraft has it display like this. After set text we have set percent which target is my progress mana bar and then the inperecent is map range clamped with the value being plugged into the mana flaot and the in b range being plugged into max mana.

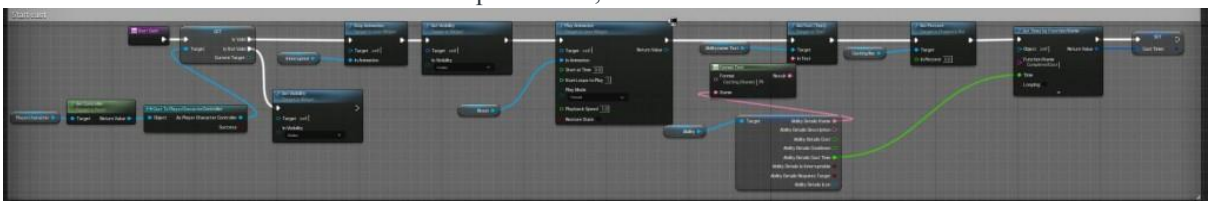


This is my blueprint for my cast bar widget UI which shows how long your spell has to cast, industry MMORPGs like World of Warcraft use this to display to the player how long their cast has left to cast which is nice and efficient. On the event construct in the event graph we get player character and cast to the player character so we can set are player character reference after this we bind event to interrupt casting and create even interrupt casting.

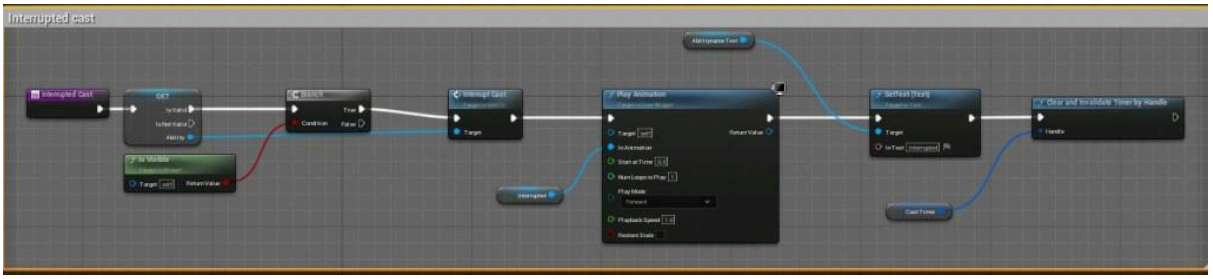
From the tick custom event we go into a branch and the condition is 'is visible' if true we set the percent of the casting bar and plug the inpercent into a normalize to range and the value is get timer elaspsed time by handle which handle is cast timer and then the cast timer gets the same node again which both plug into an add node and into the range max.



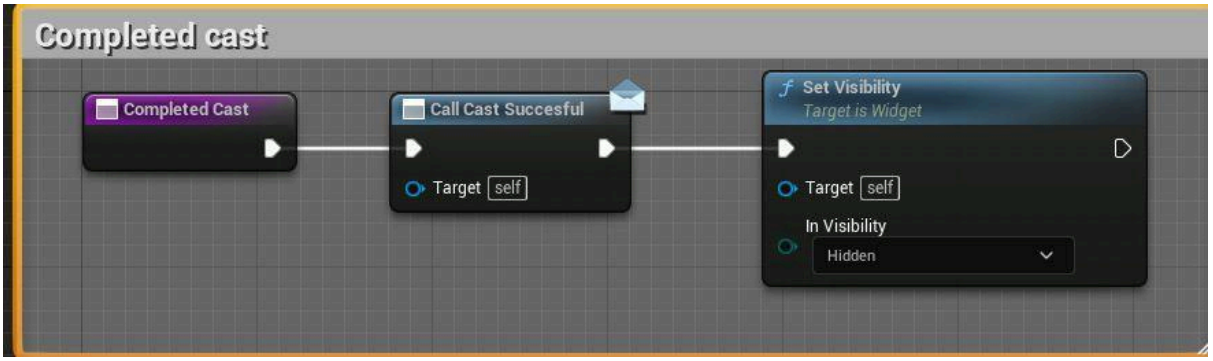
On start cast function we get is valid with the target being player character controller and get controller of the target player character, if not valid we set visibility to hidden and if valid we stop animation interrupted and set visibility to visible and play animation reset, after this we set text of ability name to intext format text node Casting {Name} which plugs into ability details name which is broken from the ability parent spell details. after set text we set the percent of the cast bar to the target cast bar and then set timer by function name CompletedCast, after this we set the cast timer.



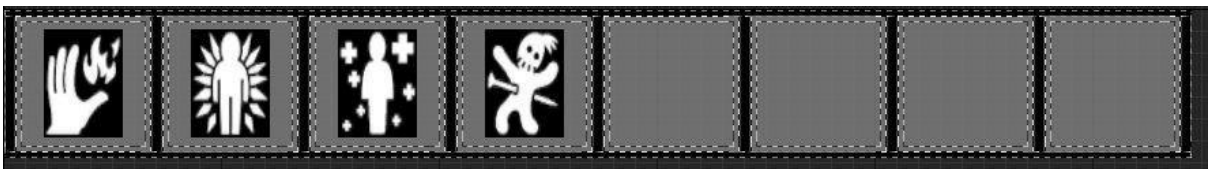
In the interrupted cast function we get is valid for the ability and if its valid we branch with the condition being is visible to know if its visible or needs to be, then from the true branch we call interrupt cast from the ability parent actor and play animation interrupted (interrupted UI widget animation) after this we set the text of ability name and then clear and invalidate timer the handle being cast timer.

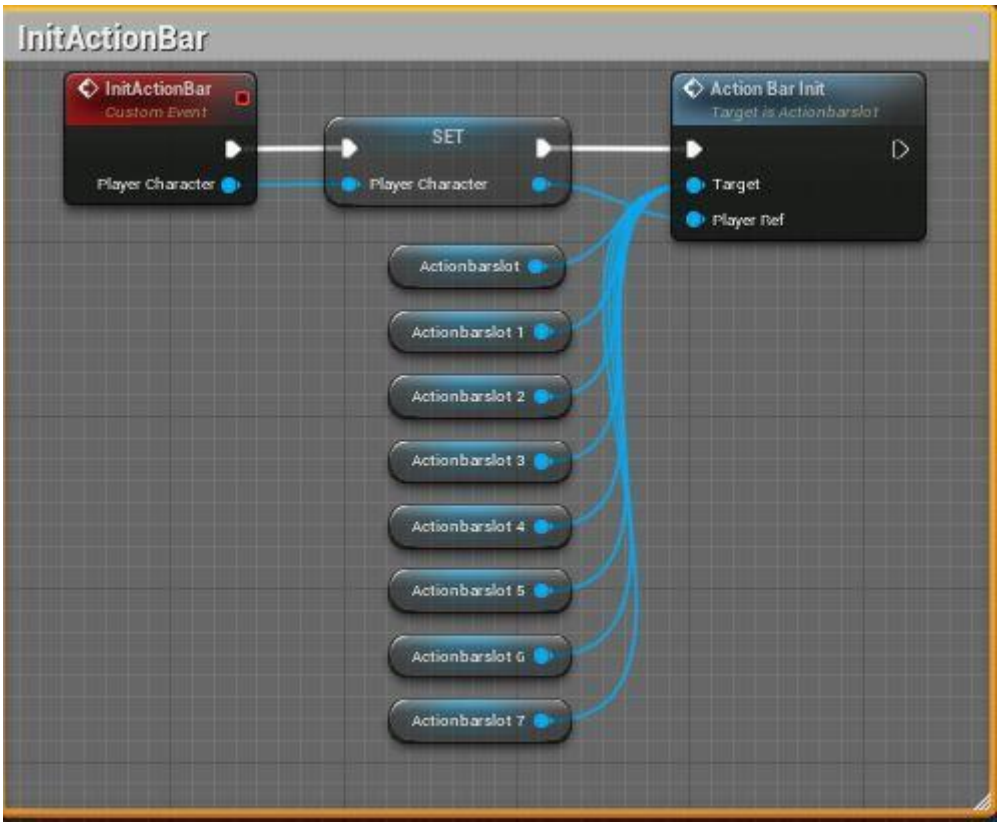


This is my completed cast blueprint which after the completed cast node it will call cast successful which is my event dispatcher and then set the visibilty to hidden so it hides the bar once its completed to avoid it

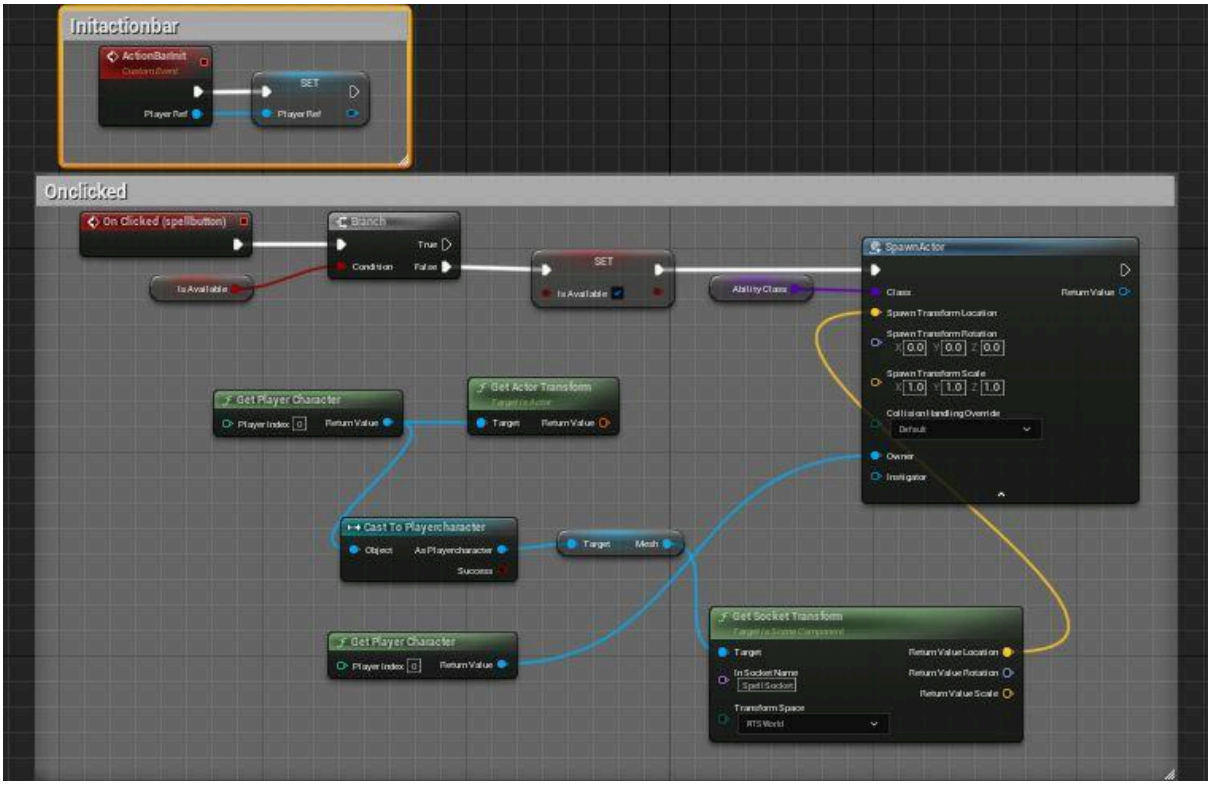


This is my action bar widget which is where my ability slots are held in the blueprint we set the player character refence of the init action bar (which has an input of player character reference) then calls the action bar init which targets all of my action bar slots on the action bar so they they are fully interactable and functionable for the player to click on.





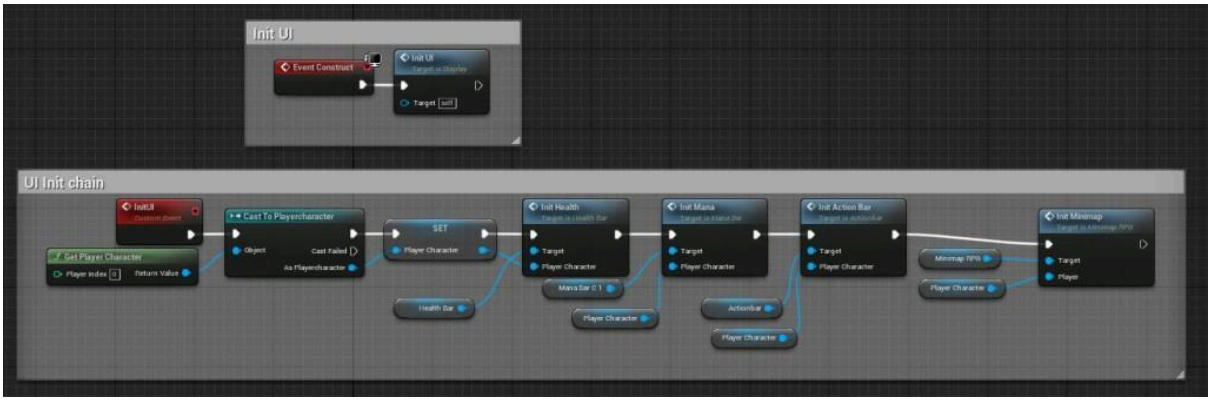
For the action bar slot blueprint widget we call the action bar init and set player reference so it can talk to my action bar properly. and on the custom event on clicked we go into the branch with the condition being is available (to cast) then if false it sets is available to true, it only worked on false and refused to work on branch true after hours of debugging and looking on the unreal forums i couldn't find a solution to this however it works as intended. after the set boolean for is available we spawn actor of ability class with the owner being player character and the spawn transform location being get socket transform (spell socket) then the target being mesh and casting to the player character and getting player character and target get actor transform.

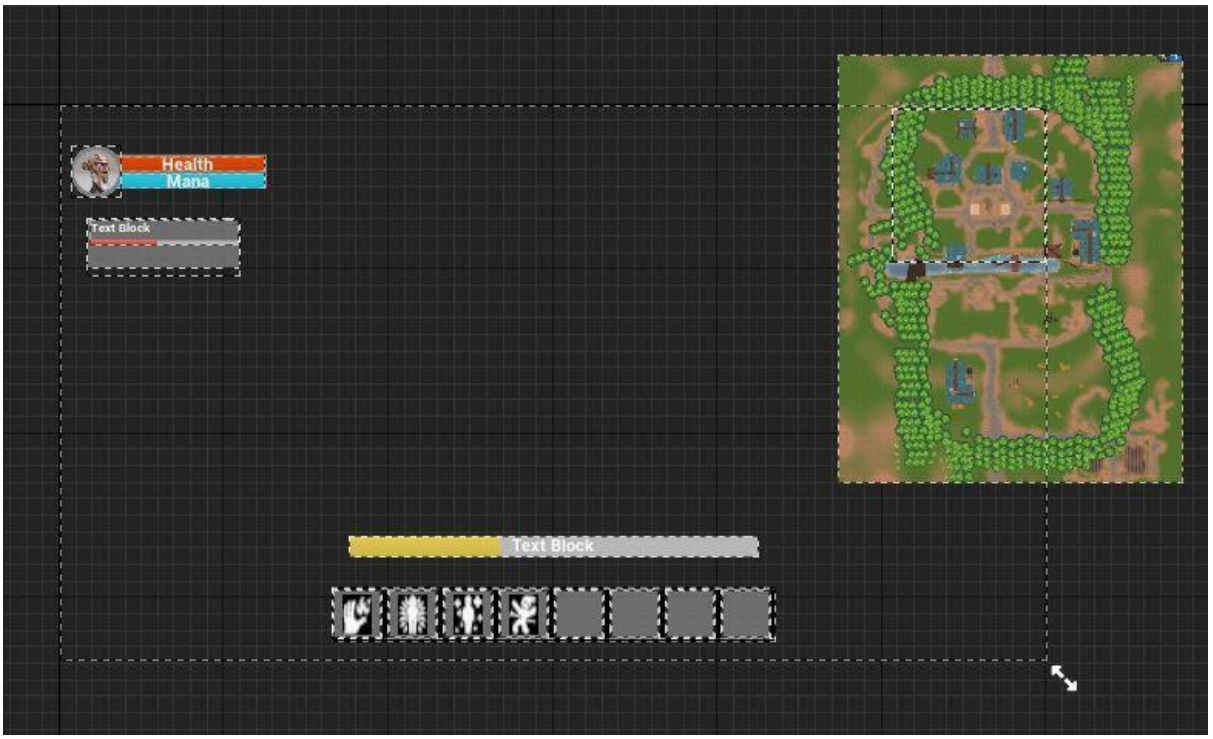


This my character portrait which I got from taking a screenshot of my character and putting it into photoshop on a grey circle with a border, I was inspired to create a player icon for my UI as a lot of RPG's will display visually the character, mine is static however if I had the time or scope i would try to make it animated to expand my skills.

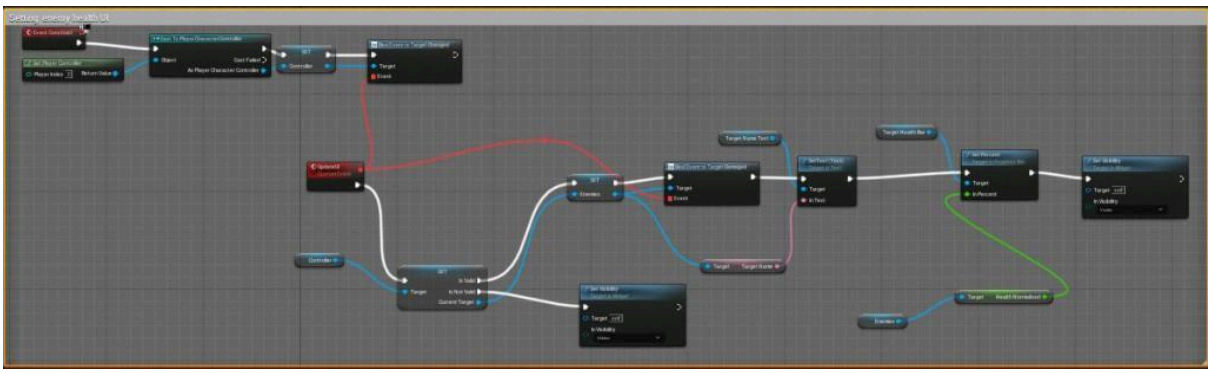
In my main HUD display widget I have on event construct init UI which calls my custom event Init UI, where it casts to the player character and gets the player character then sets it after the cast, and calls all of

my widgets that are in the displays events, for example, init health calls my health bar and plugs into player character and init mana calls my manabar and target is player.





This is my enemy UI widget which displays the enemy name and health, on event construct we cast to player character controller and get player controller and then set it, after this we bind event to target changed (which is discussed further up in my target post), which from the even pin plugs into my custom event update UI which from the exectue plugs into get is valid with the target being controller and the is not valid is plugged into set visibility hidden so if theres no target then the enemy UI widget will not show up. The Update UI event pin will go into bind event to target damaged and the current target in the get is valid will set enemies and then plug into the target of the bind event to target damaged, after this we will set text for the target name to be the the name of the target which gets the name of whatever name I gave the enemies (e.g. editable by instance so i can change each enemy ingame or children enemies. the in text will plug into the set enemies node. From set text we go into set percent which the target is the target health bar and the in percent is health normalised and target enemies and at the end we set the visibility of the widget to visible as we know we've targeted them at this point.



Example below from world of warcraft.

Below is a video of my UI working in game.

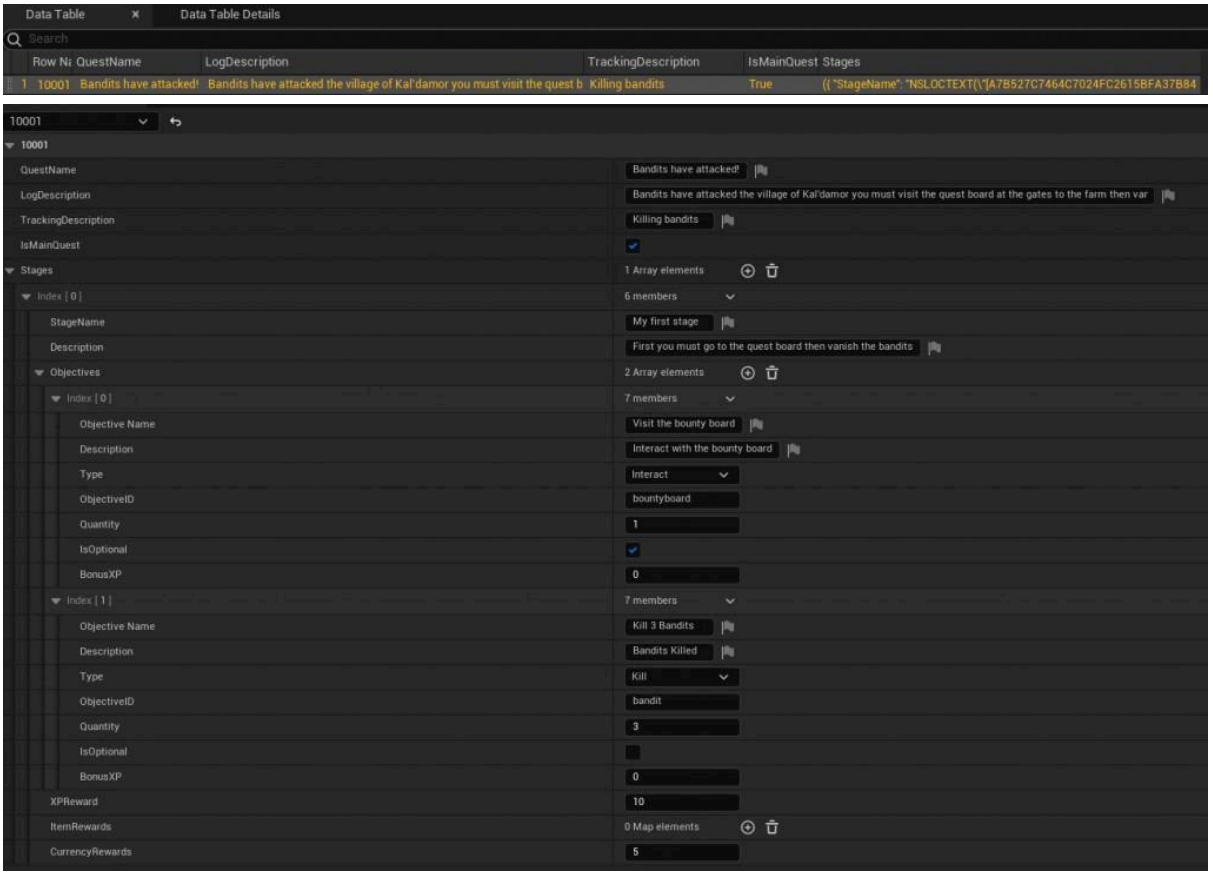
Quest System Development log progress #7

Components, data table & structures/enums

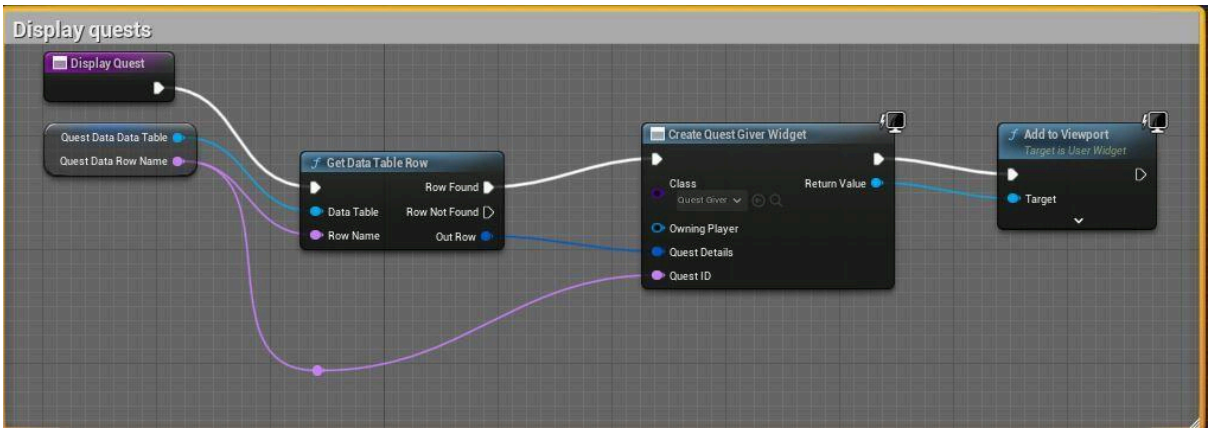
In this post I will be talking about the development process of my Quest log and Quest Giver Components, my quest data table, my quests structures and enums.

This is my data table which handles all of my data from the quest log component and the quest giver component which handles all the data for my quest or if I wish multiple quests or multiple stages of quests.With this system I can make a new row and give it a row name which I have stuck to having as numbers like 10001 so that I can easily keep to a certain language for my quest row name ID's, in this you will have the quest name, log description and tracing description and is main quest which handles that data for example below is my quest info about Bandits attacking.

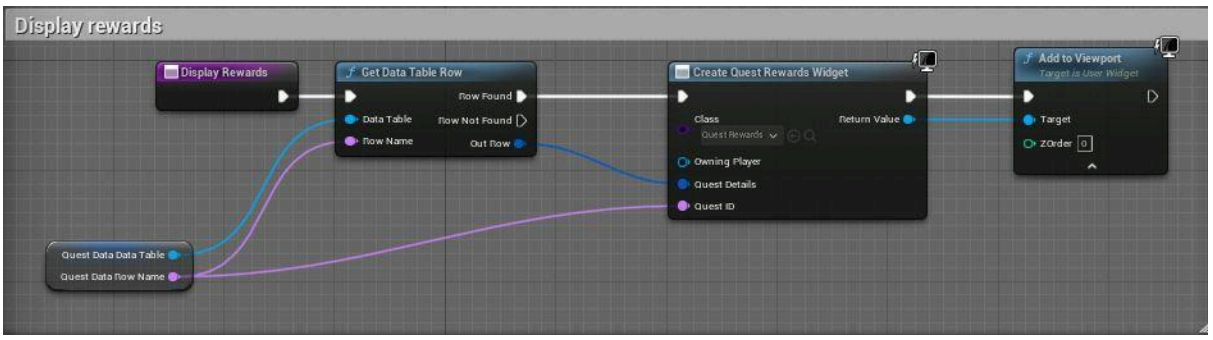
Then you have stages which is where you can have multi-layered quests, with your stage name, for example mine is my first stage as the player wont see this, then the description is a brief description of it, then you have objectives, my first objective is to visit the bounty board, description is to interact with it then type of quest is interact and the objective ID is bountyboard. with a quantity of 1 as only 1 is needed for that part of the quest to check off as complete after this I have a kill quest which is 3 bandits. This quest system is very similar to how World of Warcrafts quest system works, where you can have multi-layered quests or interact quests or reach a location quest, which leads a open road of ideas and quests you could create, while mine isn't as fleshed out art wise and feature wise, it does the job for a verticle slice to show what it could be, if I had the funding and scope after completing it.



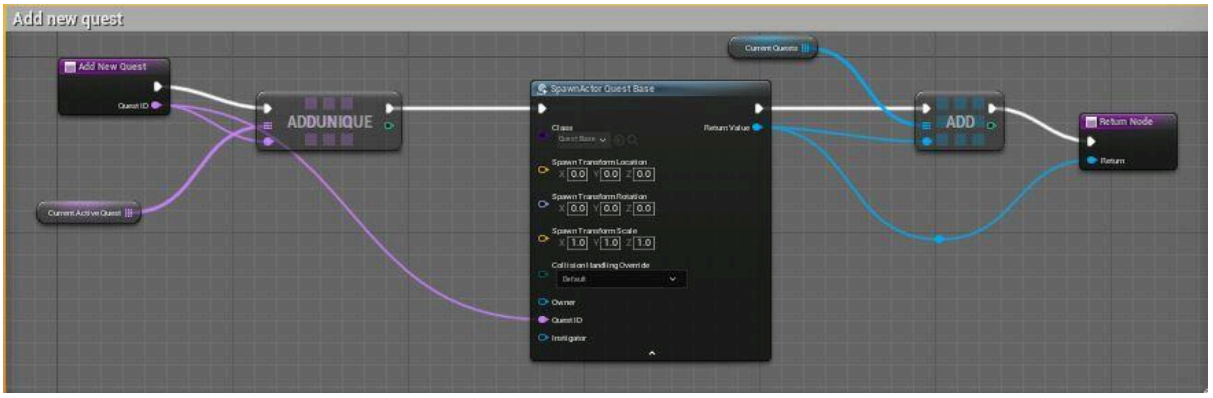
This is the blueprint in my quest giver component which is held in the components area of my NPC, below is the function display quests, which after execution gets the datarow table from quest data table along with the datarow name, if row found it will create quest widget for the quest giver and add to viewport and out row is quest details and quest ID is quest data row name, for example 10001 is a quest ID for one my quests so if the NPC has the details of 10001 in their details panel it will display this quest.



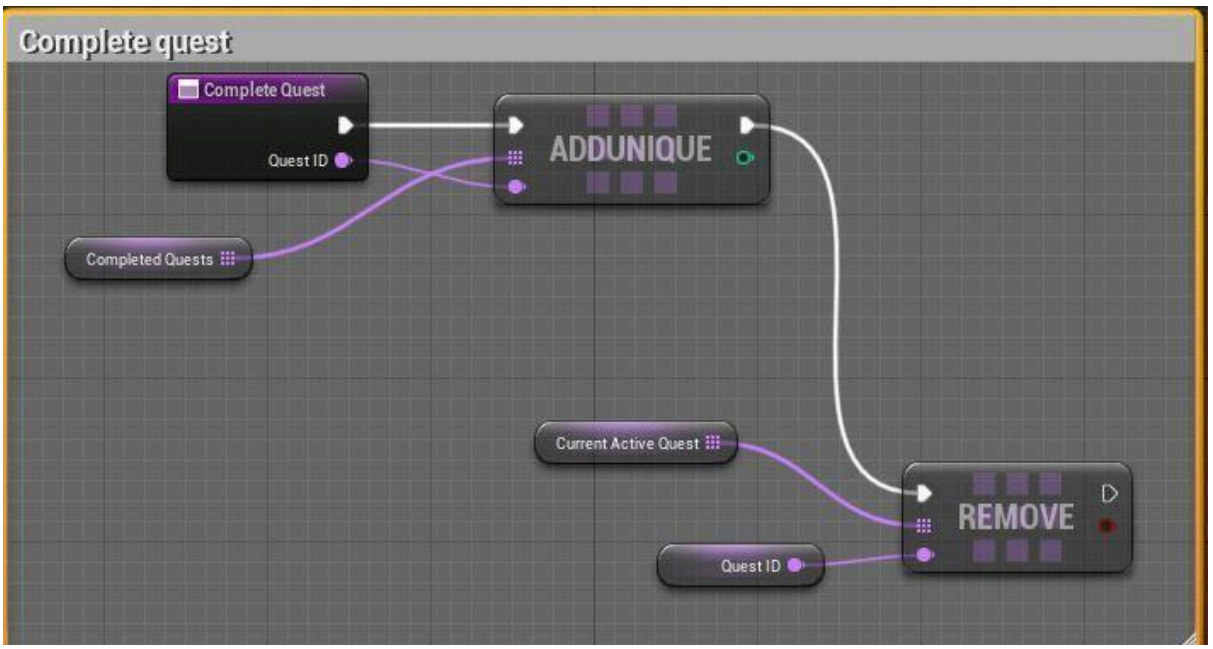
On completiton of the quest if you go back to the quest giver it will display rewards this is done by getting the data table row again and getting the quest data table and name, this functions exactly the same as the previous function however the widget is my quest rewards widget and not the quest details, which i will go into on my widgets section of quests.



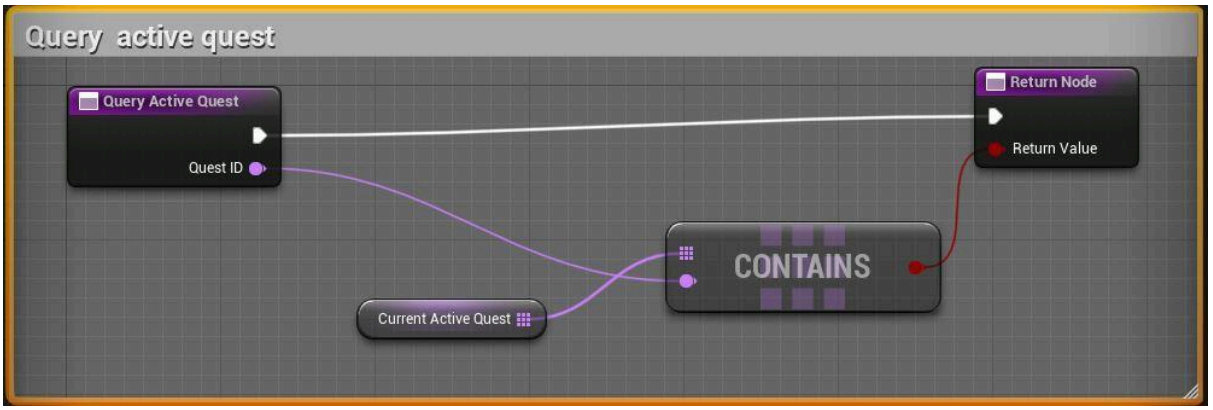
Now onto my Quest Log component, the Add new quest function is where it adds a new quest to the players quest log, so from Add new quest with the input of Quest ID (which uses a name variable) we add unique with the array being current active quest variable, then from the execute pin we go into spawn actor of class which is our quest base actor (i will discuss this in a future post) and then from the execute and return value pins we get an array ADD and for the array get current quests and then return node



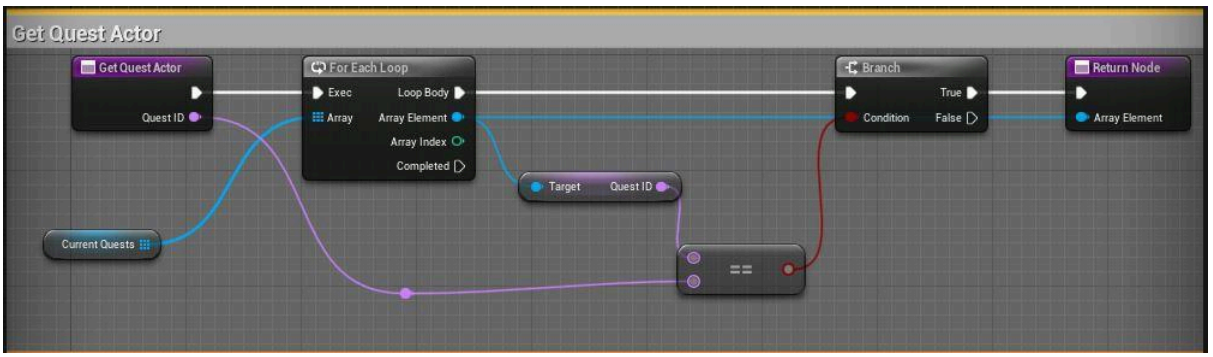
When completing quests we go from our complete quest function (with QUEST ID name variable) and add unique with an array of completed quests then go remove with the array of active quests and quest ID, to remove the quest once completed.



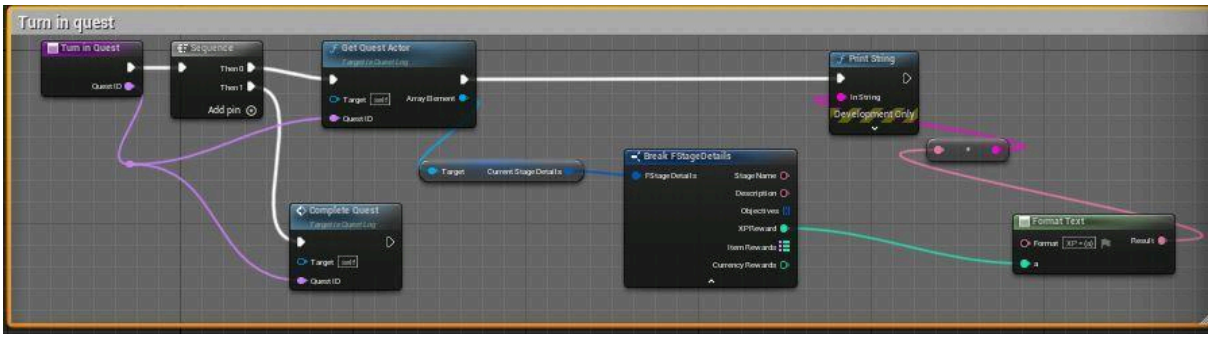
Query active quests is where we query to see what active quests we have, this goes into a contain node with an array of active quests which boolan pin connects into the return node, so we can query to see what quests we have in our quest log.



Get quest actor function is where we get the quest actor from, so in get actor function we get a for each loop with the array being plugged into the current quests (to see what quest actors are needed) then from the loop body we go into a branch witch a condotion of == which plugs into the get quest actor event function and then the array element target with a quest ID, this if true returns to my return node which is also plugged into my array element.



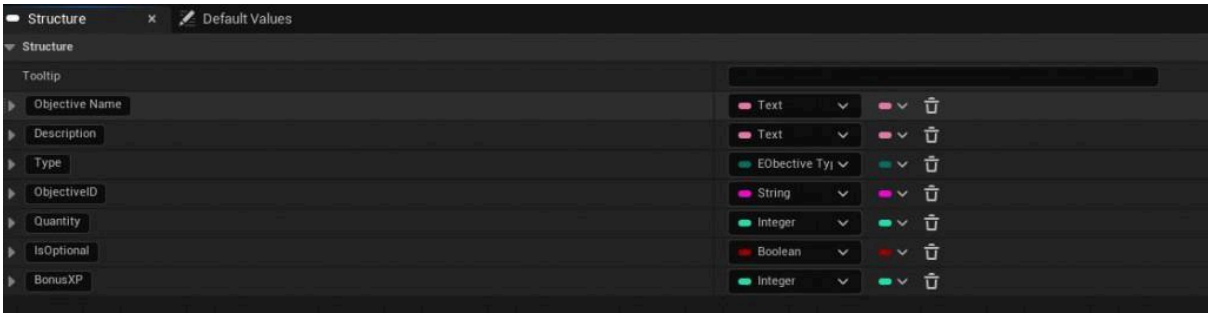
When turning in my quests we have this function called turn in quests with an input of quest ID, when plugged into the sequence then 0 is our first course of action which gets quest actor function, then from array element target current stage details we break it to get the details, if I had currency or items rewards in my game which I would like to if i had more time or a bigger scope I could connect these too but for now for testing purposes we get XP reward and format text and plug into a print string. Then on Then 1 we call complete quest function.



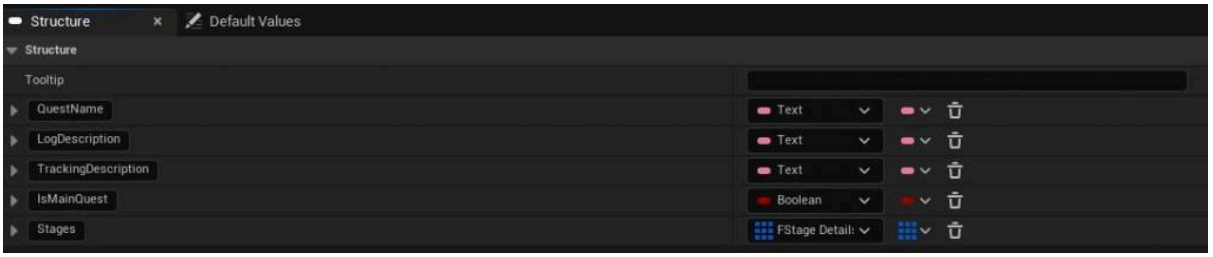
Below we have my structures and enumeration tables

Objectives types is my enumeration which holds the types of quests I have

Quest Objectives provides the rewards you could get from completing this quest and the type of quest it is (which links to the EObjective types ENUM) and then objective name and description.

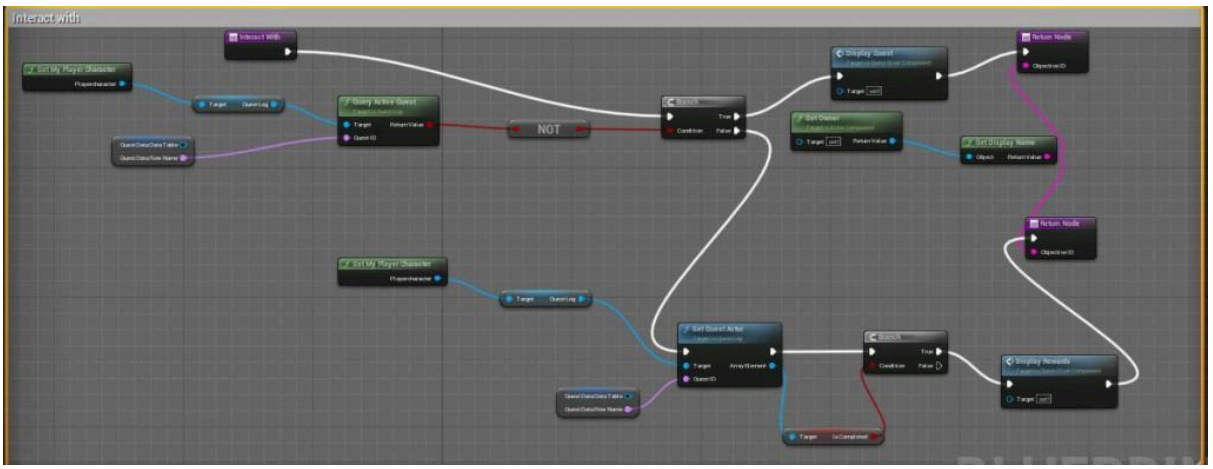


Below is my structure for quest details which holds the quest name, description for the quest log, tracking description, whether its a main quest or not, then the stage details.



Below is my stage details structure which contains all the information needed for the stages for example stage name and description, objectives, and then the rewards.

I will keep the videos and screenshots for this development when I post the widgets development so there is full context.

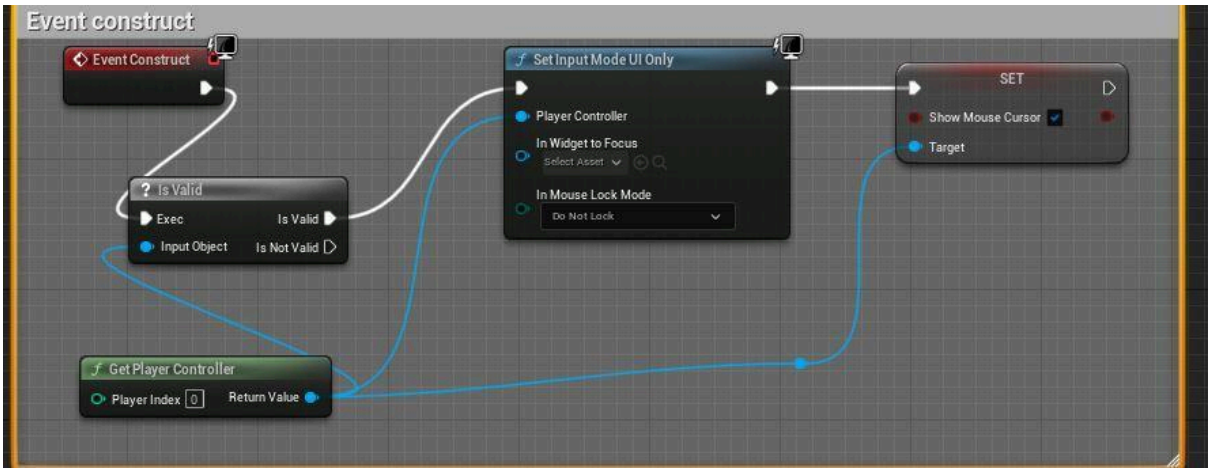


Quest System Development log progress #7.1

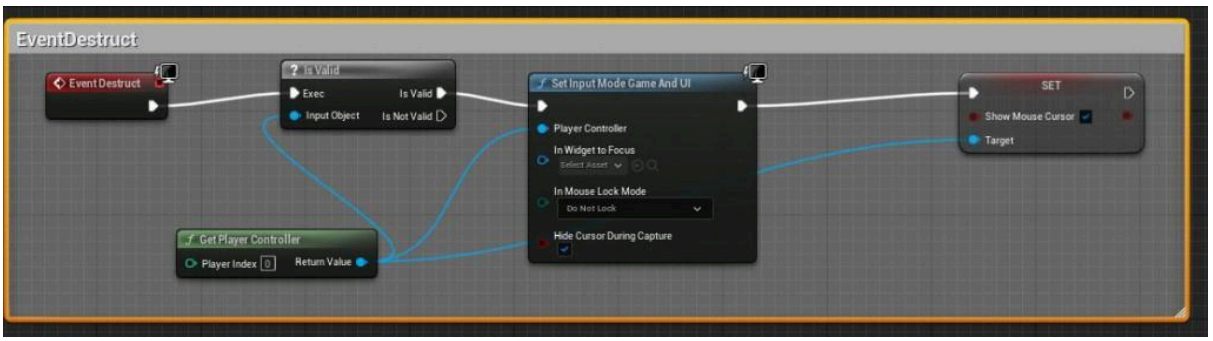
Quest log Widget!

In this post I will be talking about the development process of my quest log widget for my quest system

In my quest log widget the event construct checks if it's valid input being player controller and then if its valid it will set input mode UI only and show mouse cursor as true

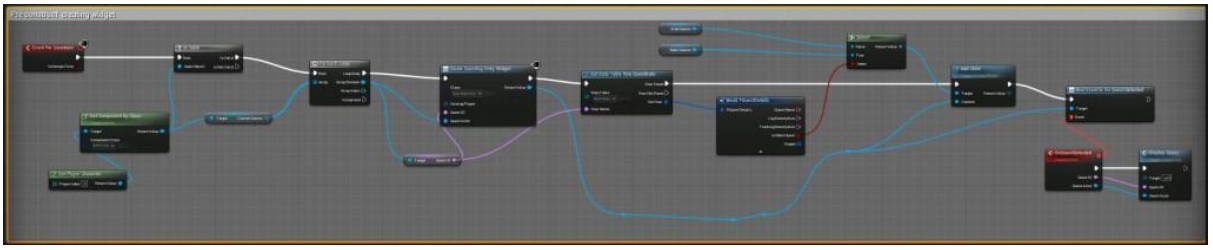


Then on event destruct it does the same as event construct due to the way my mouse cursor is set up in the game, i have it ticked to show to ensure it stays shown when ingame as without this destruct i had issues where it wouldn;'t let my mouse show in game after.

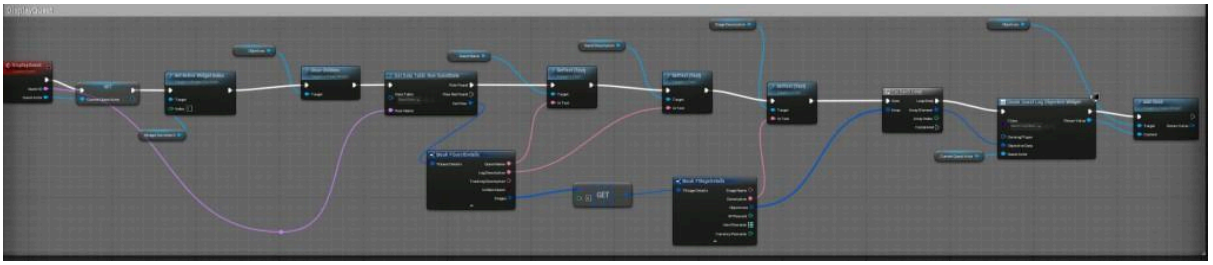


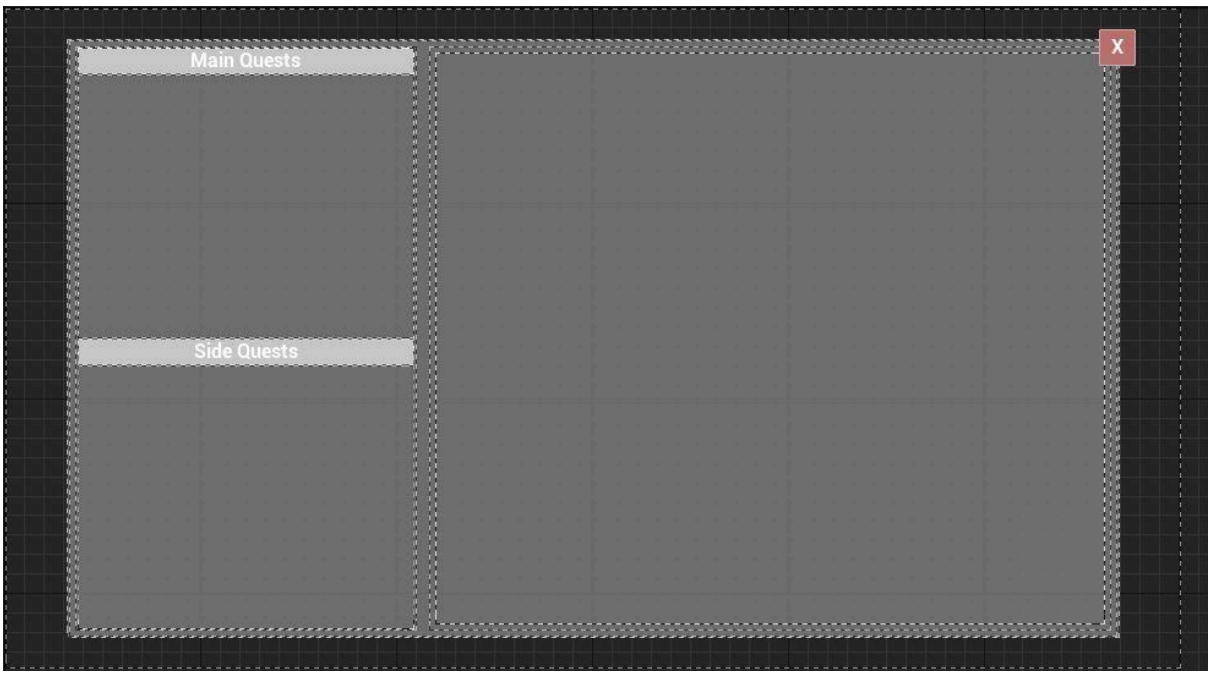
On event pre construct we check is valid again and input object being get component by class and target is player character with target on the return value of component by class being current quests array which goes into the foreach loop which comes of the is valid. Then from here we go into the create questlog entry widget which creates my questlog entry with the quest actor going into array element and quest ID into the array element but also our next node the get data table row quest data, which gets the quest ID data.

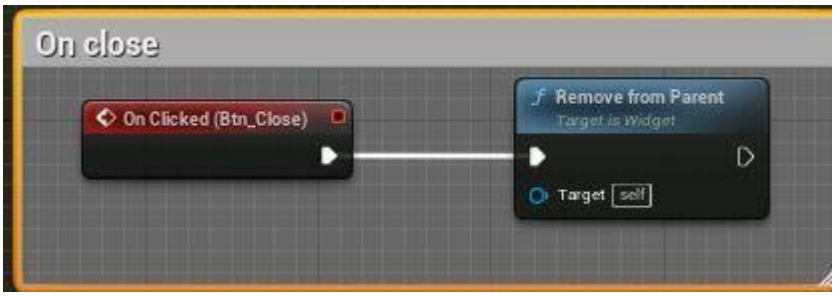
From here we break out the quest data table row and from is main quest we get a select node which if false does side quests and if true does main quests, from this we add the return value to an add child (the content from add child also goes into our return value for creating the widget) From here we go bind event on to on quest selected then target also being the create widget, on the event pin we go into on quest selected then that goes into call display quest with quest ID and quest actor plugged in.



On display quest event we set current quest actor which is where we get all out quest data and set each variable text for example the quest name and quest description





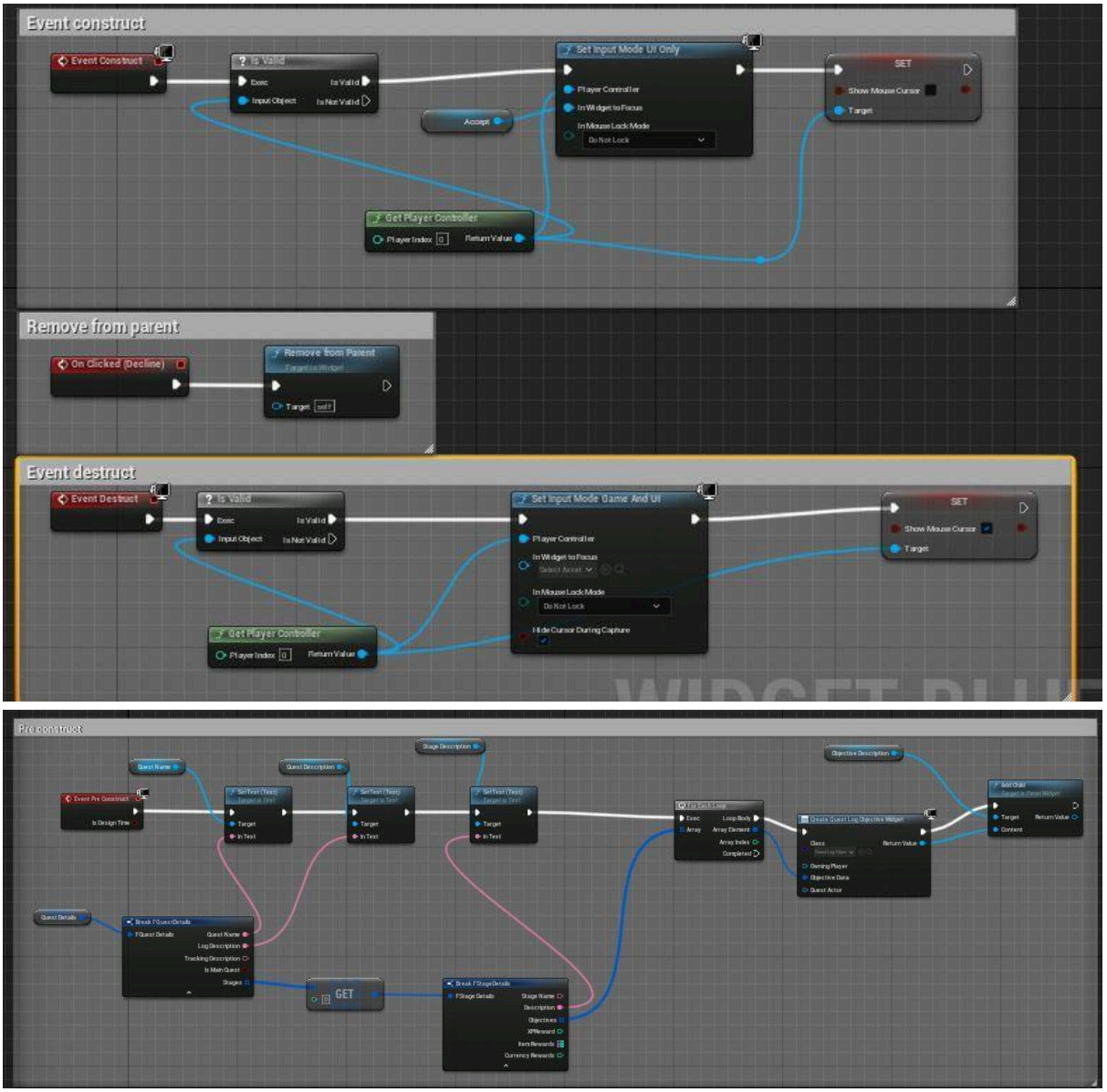


Quest System Development log progress #7.2

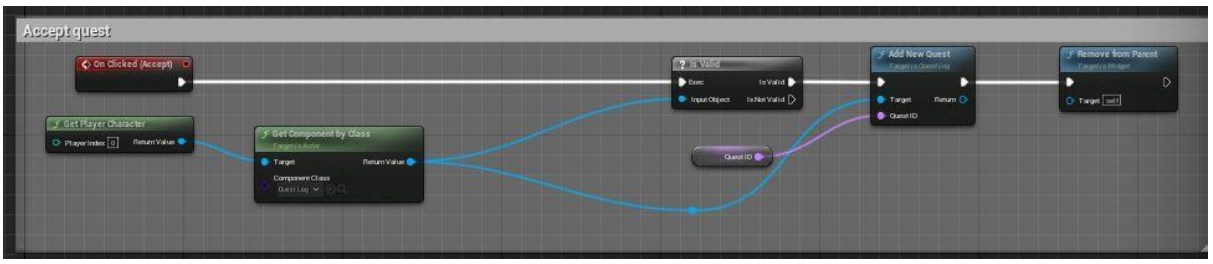
Quest giver Widget!

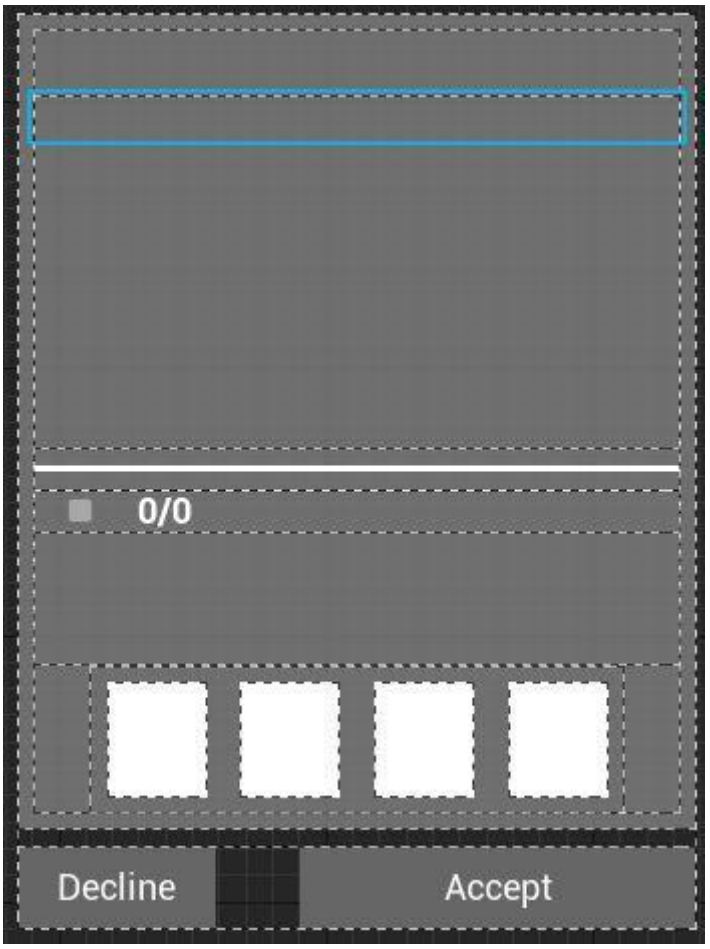
In this post I will be talking about the development process of my quest log giver widget where a lot of the blueprints are similar to the quest logs.

These blueprints are all the same as quest log widget blueprints as it works very similar however on the preconstruct we dont have the quest selected events happening.



The new blueprint we do have is On clicked accept event which where if its valid we add new quest (link to the quest ID) then remove from parent. The input object of is valid is get component by class and get player character. This is how we accept quests from the quest giver widget. then on the clicked decline we can remove from parent as we decline the quest. This system works how World of Warcraft or many industry RPGS work with their quest systems, as you can choose to accept the quest and have it display the details and rewards or decline it and not do it.


Accept quest
On Clicked (Accept)
Get Player Character
Player Index 0
Return Value
Get Component by Class
Target is Actor
Target
Return Value
Component Class
Quest Log
Is Valid
Exec
Is Valid
Input Object
Is Not Valid
Quest ID
Add New Quest
Target is Quest Log
Target
Return
Quest ID
Remove from Parent
Target is Widget
Target
self

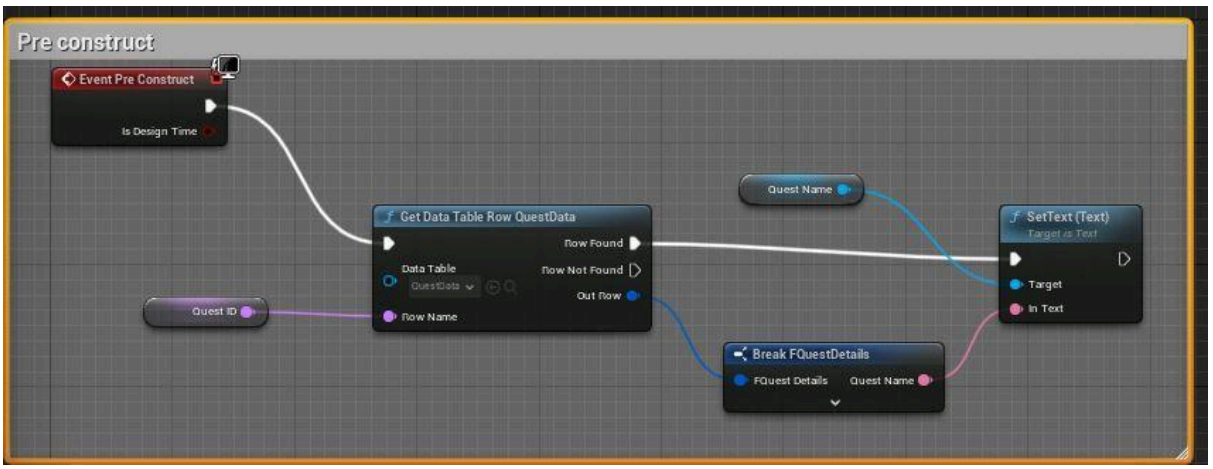

0/0
Decline
Accept

Quest System Development log progress #7.3

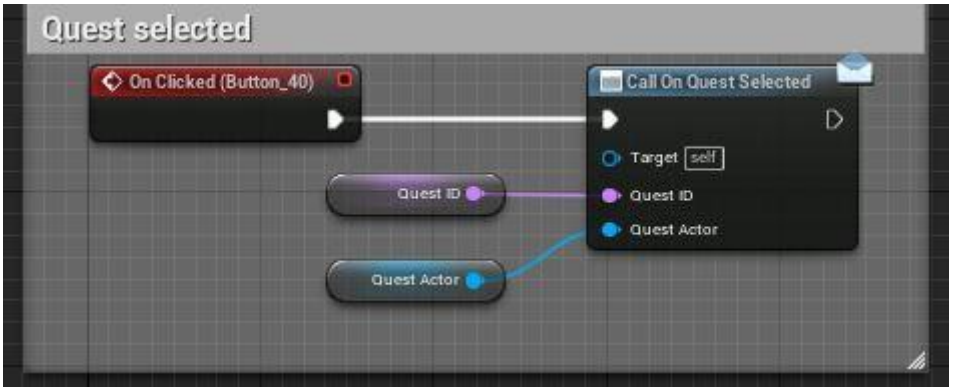
Quest log entry Widget!

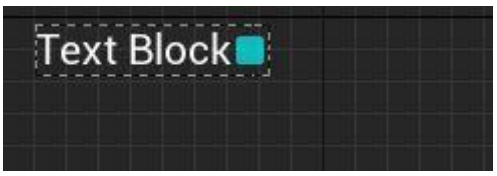
In this post I will be talking about the development process of my quest log entry widget, this system is used heavily in RPG industry games like Divinty original sin 2 or World of Warcraft where it shows your quest in an entry for the quest log, mine works similar to theirs however with their bigger budget they can fit more information and features into them.

The event pre construct blueprint is where we get the quest data and quest ID from the row name and break the quest details to get the quest name (hide unconnected pins for efficiency) and then set the quest name text.

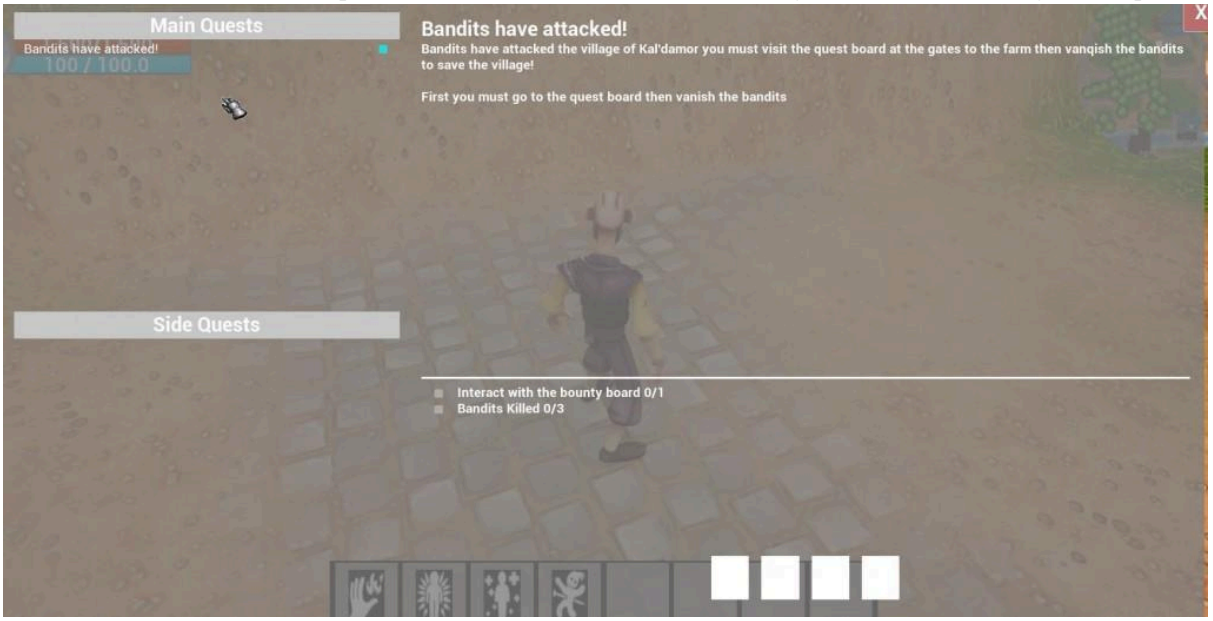


On quest selected it will call on quest selected (event dispatcher) of the quest ID and quest actor.





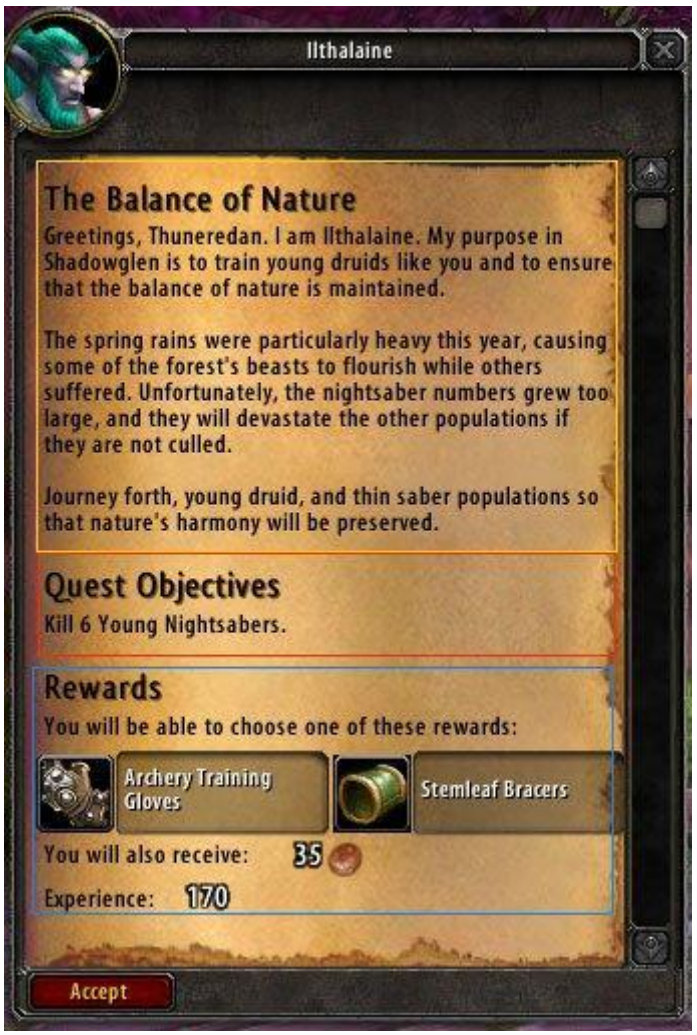
The final look of this is below which shows the main quests and the entry objective on the left "bandits have attacked!" which is the quest name and its blue check box and if you select it it shows you the quest.



Quest System Development log progress #7.4

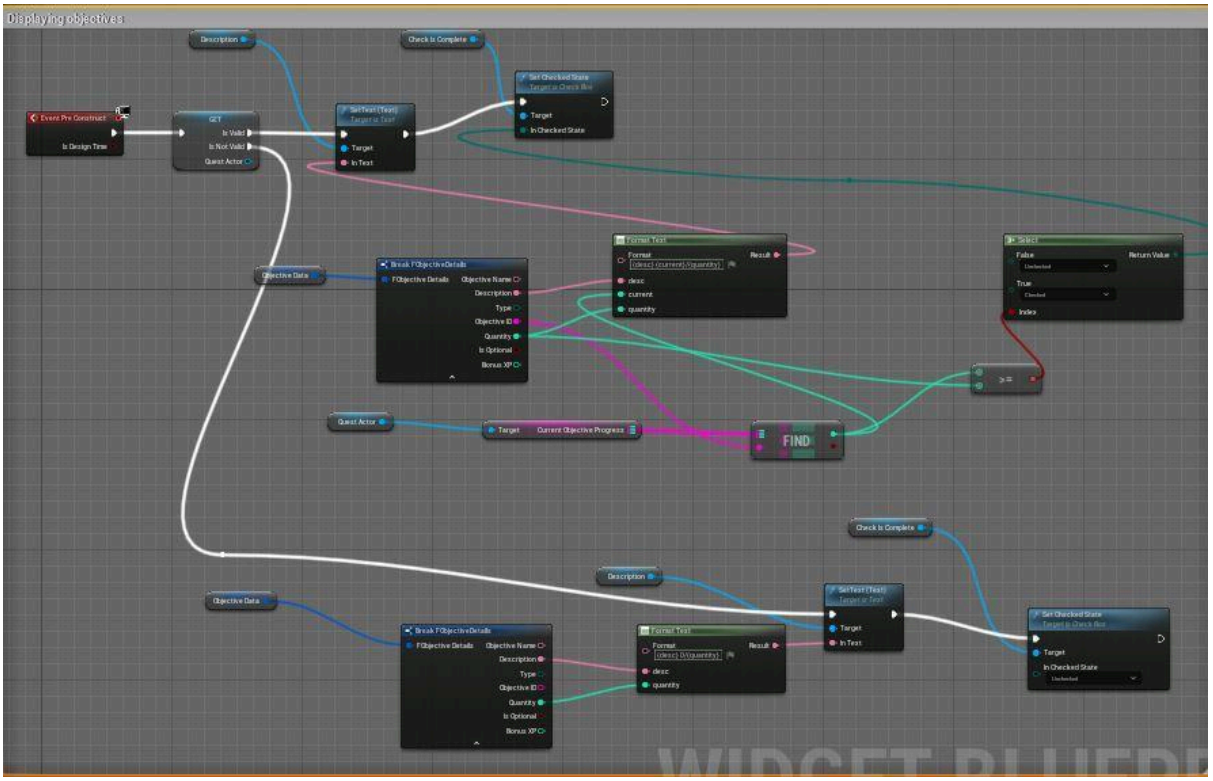
Quest log objectives Widget!

In this post I will be talking about the development process of my quest log objectives which are also used in RPG's like world of warcraft.

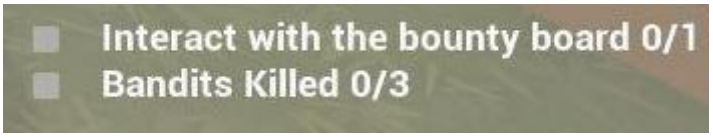


This where I handle displaying the quest objectives like 0/3 bandits killed as an example, from pre construt we get is quest actor valid, if its valid we set text for description to format text ({desc} {current}/{quantity}) which we plug the desc from format text into the description pin in the broken objective details thats breaked from objective data, the quantity needed is plugged into the quantity and the current is plugged into the FIND node which plugs into the objective ID on the breaked objective details and the array is plugged into current objective progress and the quest actor target so we can find the current progress so the quantity and current can be tracked properly in the objectives.

then from the set checked state afterthe set text in checked state we go into a select state and if false its disabled and if true is enabled with the condition going into a >= node where it plugs into ind the current objective progress then if it's >= it will plug into the quantity so if its complete it will mark it as checked. and on the is not valid from the get valid quest actor node, we set the text of the description to format text and then desc into description and quantity into quantity, the set checked state is set as unchecked.



Design and final piece for quest objective widgets. (videos of these working will be posted after these progresses are done so full context of them working is given.

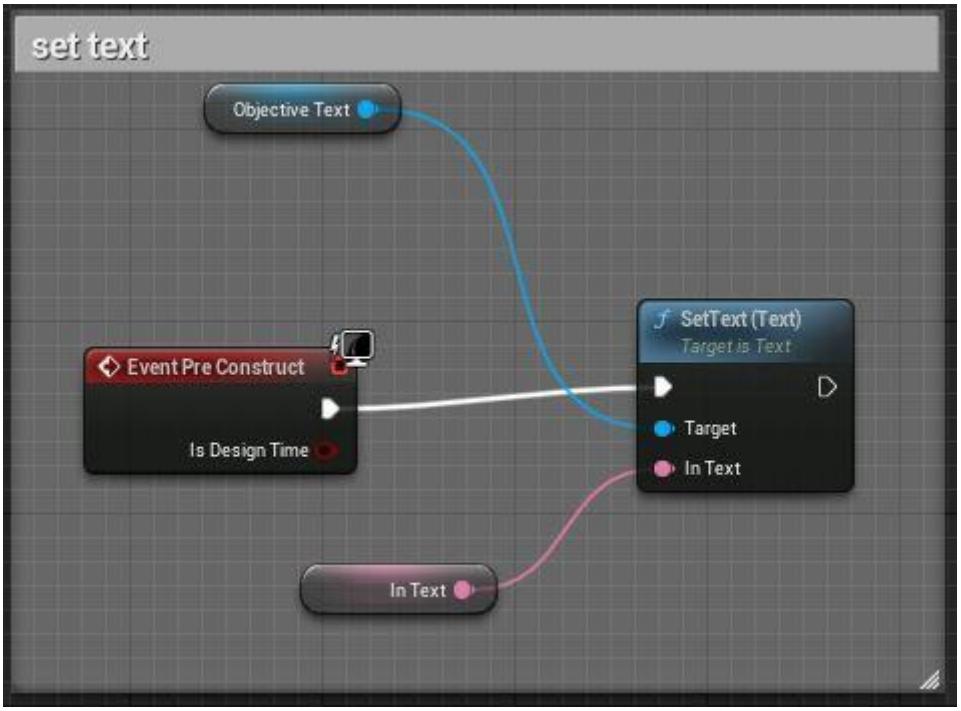


Quest System Development log progress #7.5

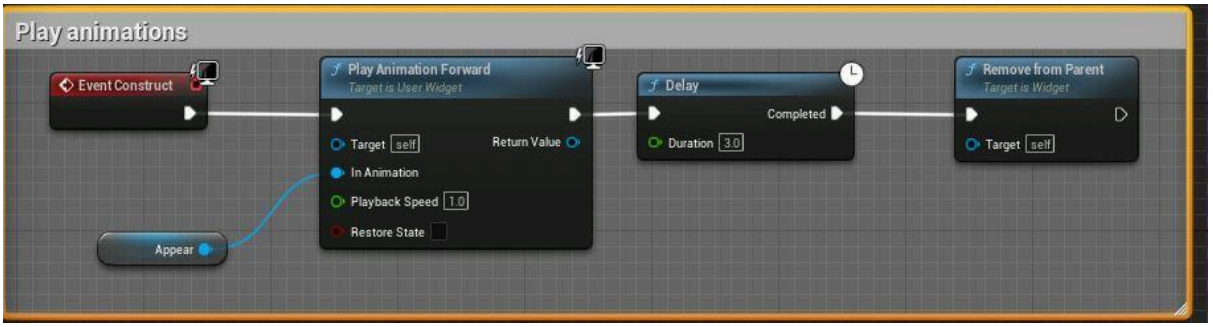
Quest log notifications Widget!

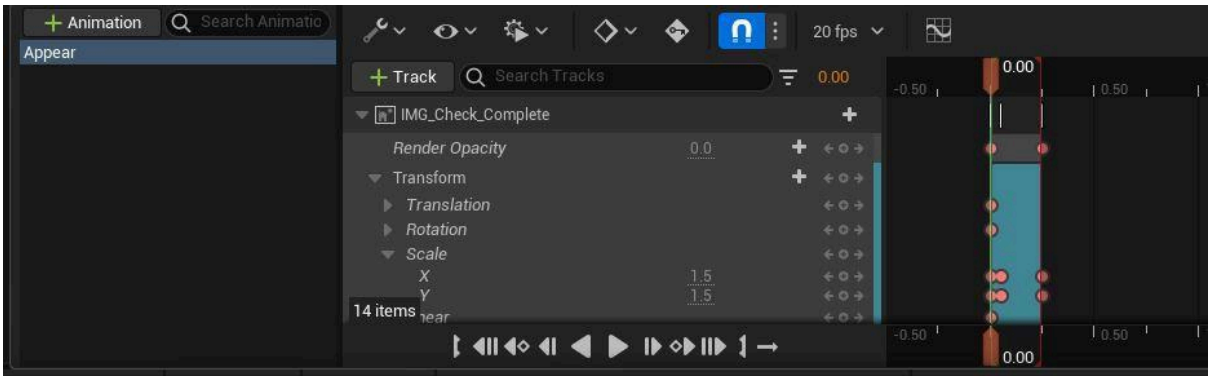
In this post I will be talking about the development process of my quest notifcations

In event preconstruct we set the objective text which sets what the text will show when the notification appears

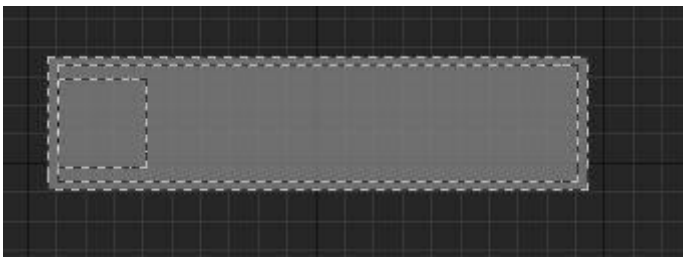


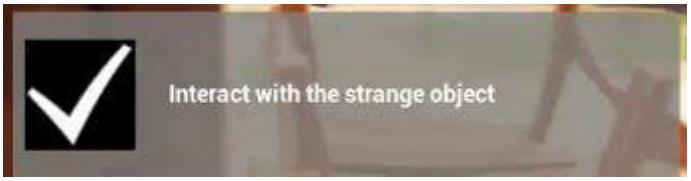
Next on construct we play our animation forward node for the widget which animation is appear reference (which you can see on the timeline below where i change the render opacity and scale) after this it delays for 3 seconds then removes from parent.





Here is the design view of this widget and the final piece



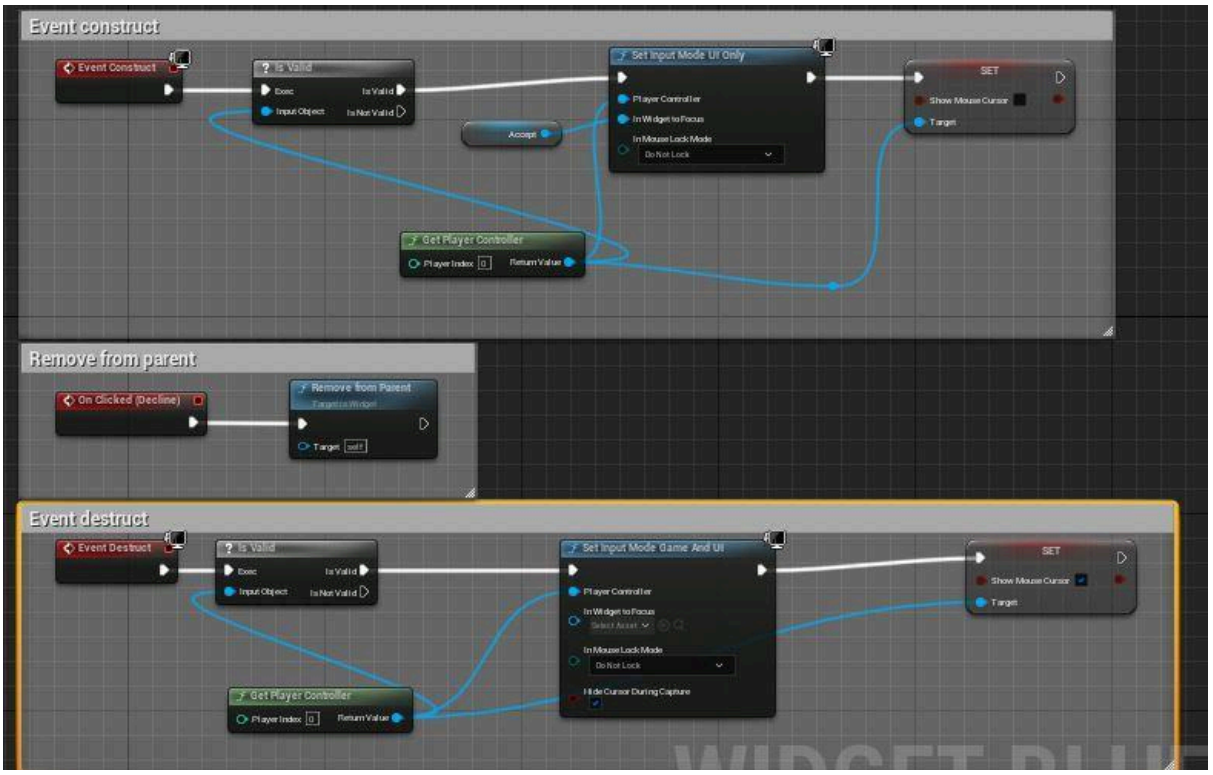


Quest System Development log progress #7.6

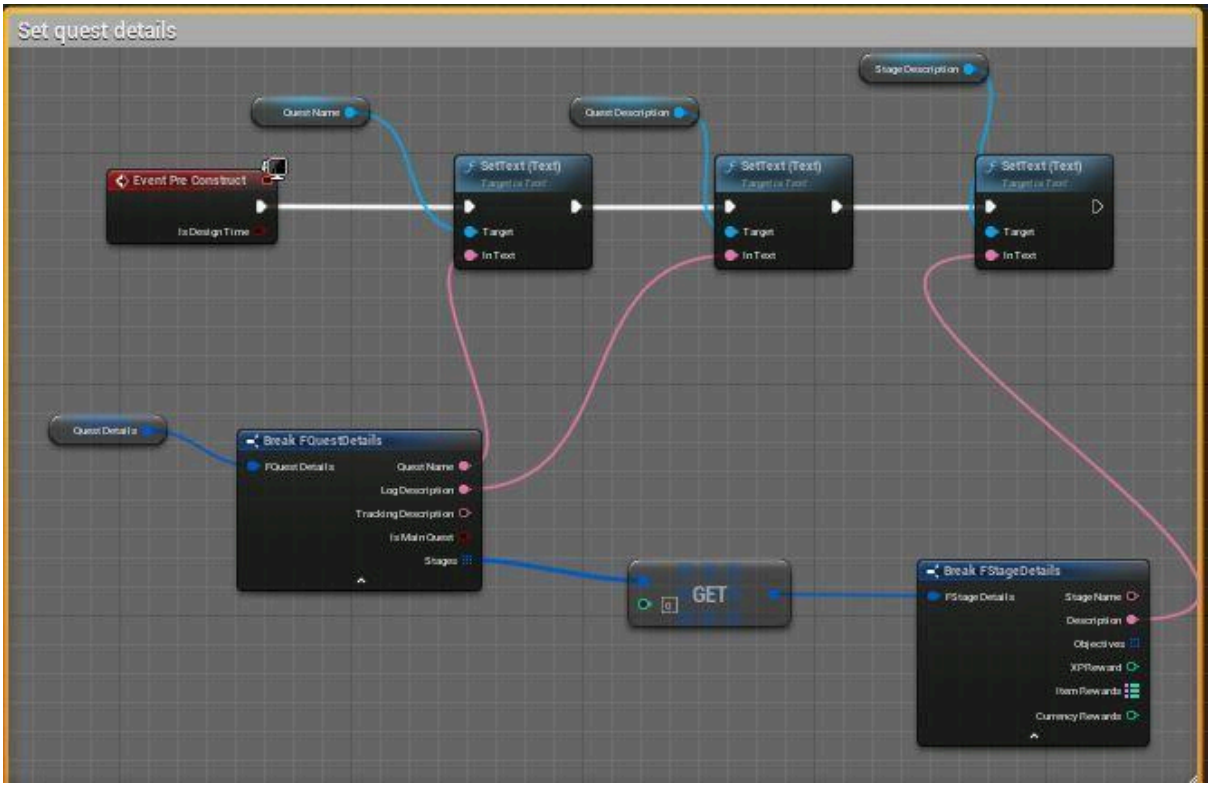
Quest rewards Widget!

In this post I will be talking about the development process of my quest log rewards

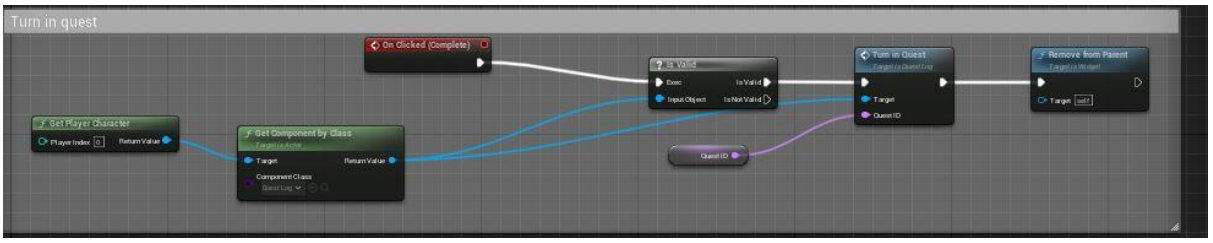
These blueprints remain the same/similar to my quest log and quest giver log so i've just included the images again for context.



#



This blueprint is also the same as accepting quest on the quest giver log widget however instead of adding a new quest it turns in the quest



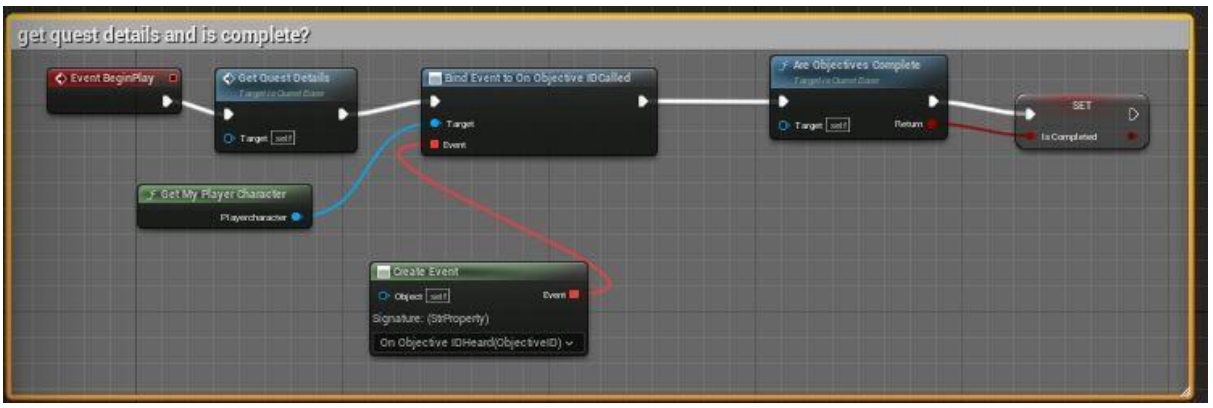
Quest System Development log progress #7.7

Quest base Actor

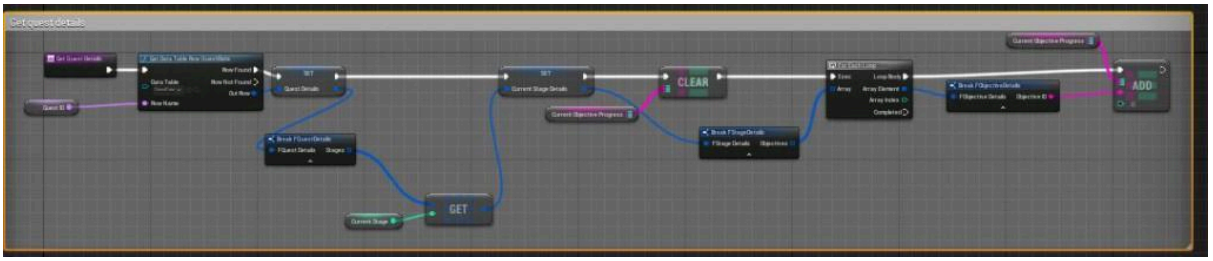
In this post I will be talking about the development process of my Quest base actor.

On event begin play in the event graph it gets the event function called quest details then goes into beind event to an objective ID called and target is my player character and the event pin goes into create event

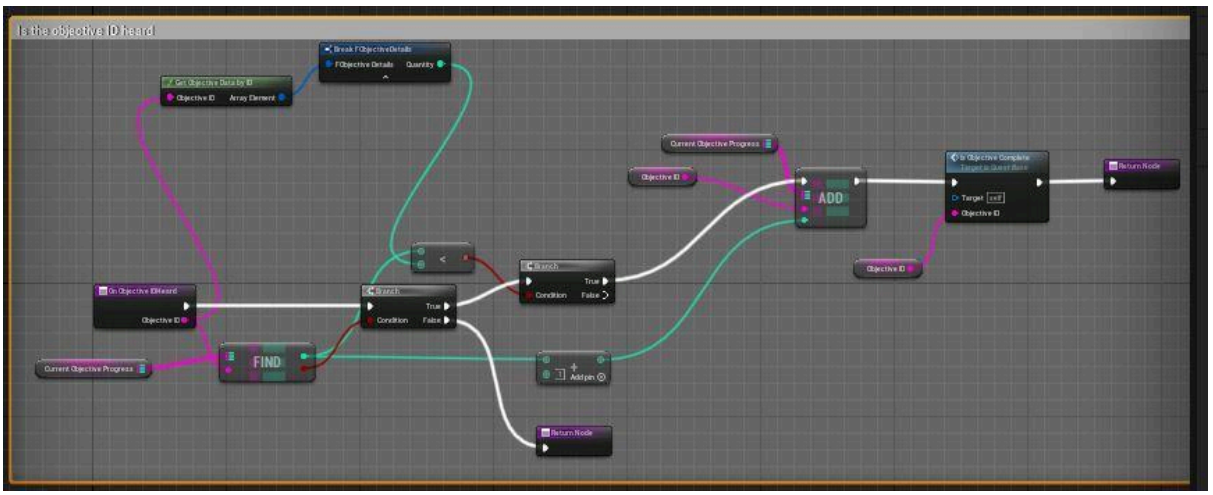
matching function which is on objective ID heard after the bind event we call are objectives complete and we set whether they are on the boolean set.



in the Function Get Quest Details which we call in the begin play, we get the data table row for quest data and plug the quest ID into the row name and after that we set the quest details and break that so we just have stages show and we use the GET node and the current stages and plug it into the set current stages details which is after quest details, so we know the details of the current stages we have on us in the quests. after this we use the CLEAR node and from the array we get current objective progress and go into a for each loop which on the array its plugged into break stage details for objectives which is plugged into set current stage details. after loop body we use the ADD array node to get current objectives progress and objective ID.

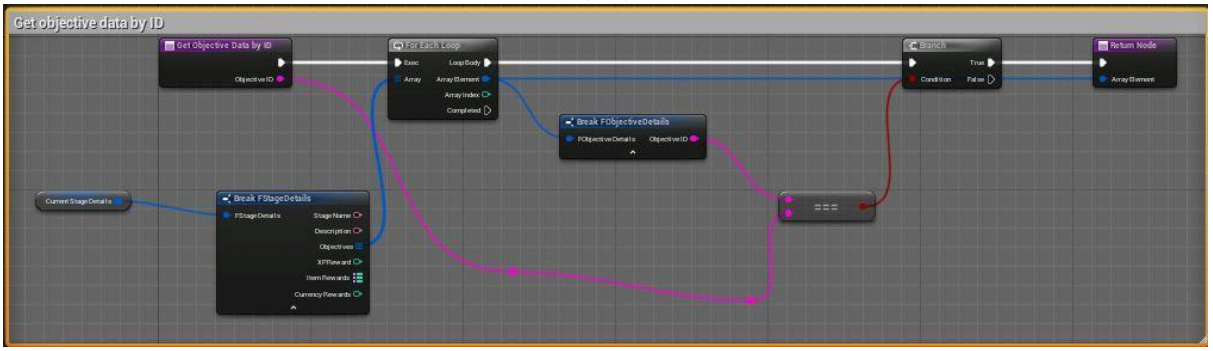


On the is objective ID heard function we have a Objective ID input pin which plugs into get objective data by ID which breaks and only shows quantity and plugs into our < node, while the objective ID also gets the FIND array node which gets our current objective progress and makes that the condition of our first branch and plugs into our < node which is the condion of our next branch, when true this last branch goes into an ADD node (the FIND node also adds (1) into the ADD array) we have the objective ID and current objective progress held in our ADD array too which exectures into is objective complete with objective ID so we make sure we have the right objective node, then plugs into a return node.



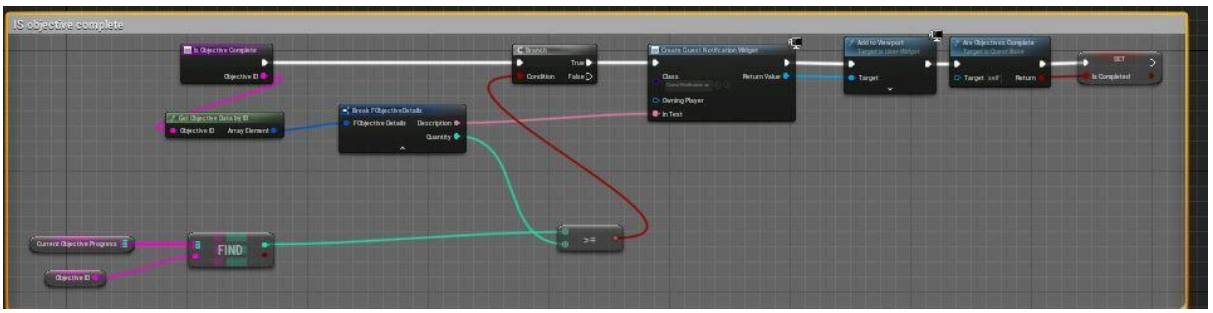
On the function get objective data by ID we go into a or each loop where the array plugs into a break of the stage details (which it's pinned into by reference) and gets the objectives, on loop body we go into a branch where its condition is === which tests if the input strings are equal. which plugs into the start functions objective input ID and the objective ID from the array element break in the for each loop. and then returns when true on branch.

dgsdg

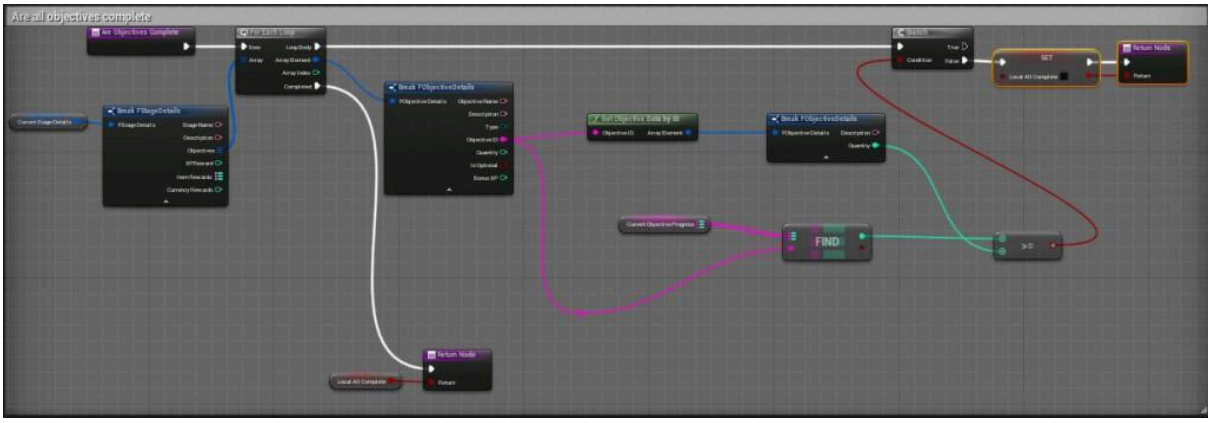


To find out if one of the objective are complete we we the is objective complete function with an input for the objective ID as its important we always have that so we get the right objective ID come through on our quest, we have a branch connected to this function where it's conditon is >= with the bottom pin going into objective details quantity and then the array element get objective data by ID and then plugged into the input of is objective complete. the top pin of the >= goes into a FIND node which on the array gets the current objective progress as it's important we know our current progress otherwise we shouldn;t be able to complete if the current is lower than the required, and the objective ID is also plugged in.

From the true in the branch we create quest notication widget which in text gets the description from objective details, after this we add to view port and set that objective complete.



This final function is where we see if all the objectives are complete rom the is objectives complete we get a for each loop then on the array get the current stage details objectives from the breaked reference of the current stage details, then from completed on the for each loop we return node with the output local all complete (which is a local variable) and then from loop body we get a branch and the condition is again >= (greater than or equal) with that being plugged into the FIND node with current objective progress and objective ID and then quantity in objective details and get objective data by ID, if false we set local complete as false and return.



I didn't run into any issues when creating this quest system blueprint as I used a tutorial to help me learn how to create a quest system with my knowledge and any knowledge I didn't know and wanted to learn, so i could teach myself, I am also able to use it and edit it to the way I wanted to work as a reference point, it was really useful and I learn a lot of more efficient ways to blueprint and use functions as well as arrays and their nodes, most importantly I learnt how to use a function library which was super useful and made my workflow much faster.

Quest System Development log progress #7.8

Working videos and screenshots of final quest system

In this post I will be showing the final development of my quest system. I thoroughly enjoyed creating this quest system and did face a few challenges when creating it even though I used a tutorial to learn and use as a reference point, I ran into a few bugs where the widget wouldn't appear properly when I wanted to hand it in, this turns out I had the wrong array plugged into one of my widget functions which I had to

problem solve myself to figure it out but I learn what I did wrong and it should help me in the future, I had to iterate on the interacting with quest givers and items for the quest system as I'm doing it third person it links into my camera boom, while originally it was a line trace it didn't work for me in third person however I got a sphere channel trace working, while it isn't perfect and I've had a few issues with it, it's far better than what it was before but by no means perfect, i would intend to make this better for GRADX and this isn't as efficient as how World of Warcraft has it with right click NPCs that have a quest to give or hand in, however with more scope or time I would of liked to implement this version how for a verticle slice using E action input to interact does the job. There is a lot I could do with quest system for quests from interact, location to kill and so on with multiple differn't stages for a basic verticle slice, whoever it defiantly isn't comparable to an industry system which has a bigger scope and budget and time to implement more interesting objective types and quest with narrative designers and artists to make the UI widgets look visually appealing.

Level design feedback changes Development log progress #8

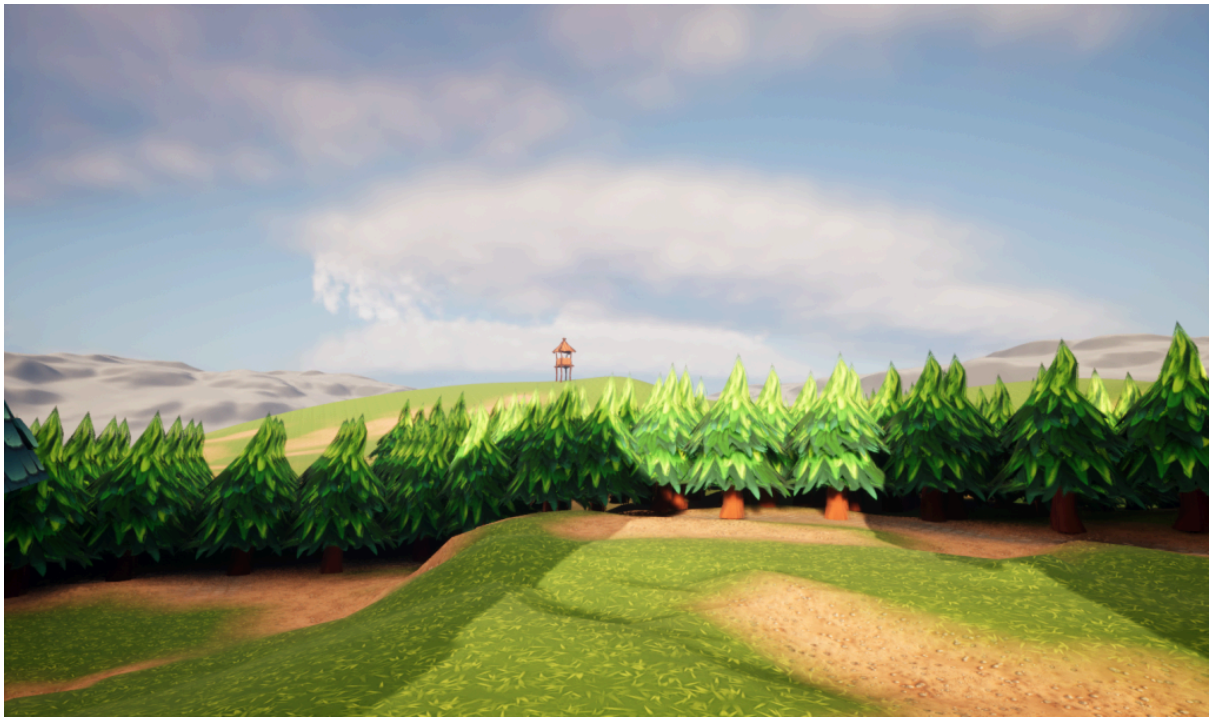
Level design iteration and feedback changes

(I have put feedback and problem solving and iterations through my forums however not all of them have obvious heading like this sorry! will try and make it more concise just to make you aware it does appear more often then this post for feedback)

This is a picture of my old level which was empty apart from a few houses and open space, which when I got valuable feedback from my lecturer about it it felt empty and made it look like there wasn't much there compared to the amount of blueprint there actually was, this was super valuable feedback and made me work on this feedback and make a little enclosed starter zone that wasn't massive but kept you to a small concise area. I also took the feedback and made it a reality of having towers in the distance to give the player the sense of discovery for when they leave the starting zone and a small fenced off exit to the zone which was inspired by world of warcraft wall in the human starting zone of goldshire where the whole starting zone is fenced off apart from one exit you leave once you've completed all the quest stepping into the big wide world. I built the narrative into the environment like how bethesda does their games but onto a smaller scale and and extent, with carts toppled over and food everywhere to show bandits have raided and bounty boards. I am overall happy with my new level design and makes the verticle slice feel more like a verticle slice and not just an empty HUGE world with a lot of underlining gameplay blueprint mechanics which can't be shown off as well due to the lack of level design.

(old level design)

BELOW is all my New level design screenshots compiled for you.



Asset packs and resources used Development log progress #9

Asset packs and resources used

These are a list of asset packs and resources I used for my project which I disclaim I didn't create or make, which I only used to visually complete my project as I'm focused on blueprint and design rather than creating art and assets.

Player character model https://www.mixamo.com/#/?page=1&type=Character - Abe character

Assets and meshes https://www.unrealengine.com/marketplace/en-US/item/be025cd5631141868361885b169e9994

Spell action bar icons https://game-icons.net/

font - https://www.1001freefonts.com/immortal.font

mouse cursor - https://community.custom-cursor.com/t/world-of-warcraft-cursor/6956

Feedback, issues and iterations Development log progress #10

Feedback, issues and iterations

Here I will be talking generally about feedback, issues and iterations I have made, it's important to note that I have included feedback, issues and iterations and problem solving discussion throughout my posts where needed this is just a general post on this.

I had feedback regarding my ability buff and ability debuff which heals the player or damages the enemy from my a fellow student as originally this system unintentionally would let you spam the healing buff on yourself multiple times or on enemies for damaging with the debuff, as explained in my progress post #4.4, I listened to this feedback and implemented a clear dupe function which would ensure that you couldn't spam it on yourself and if you casted it again it would clear it, i got into more detail on this in that post. Therefore I had to problem solve this issue to find a solution and thus iterating on my blueprint. For example World of Warcraft doesn't allow you to spam multiple buff or debuff actors on yourself or the enemy as it would be gamebreaking over powered, so I did look into this as a reason to have a clear dupe after my feedback from a fellow student.

I was also given advice and feedback by a fellow student who I can't name due to the ethics form, about using behaviour trees after showing them my original iteration of my AI blueprint this feedback was really valuable and helped me to push in creating a far better AI using behaviour trees and AI controllers.

I got valuable feedback from my lecturer about it it felt empty and made it look like there wasn't much there compared to the amount of blueprint there actually was, this was super valuable feedback and made me work on this feedback and make a little enclosed starter zone that wasn't massive but kept you to a small concise area. I also took the feedback and made it a reality of having towers in the distance to give the player the sense of discovery for when they leave the starting zone and a small fenced off exit to the zone which was inspired by world of warcraft wall in the human starting zone of goldshire where the whole starting zone is fenced off apart from one exit you leave once you've completed all the quest stepping into the big wide world.

However I did encounter more issues when I tried building my game, this involved my characters UI appearing on my main menu screen on the built version of the game however it didn't appear in the standalone editor launcher, I fixed this by debugging with F9 on all of my blueprint and after extensive research on the UE5 forums(for example https://forums.unrealengine.com/t/i-dont-want-show-characters-hud-on-main-menu/448682) I realised that I needed to create a separate gamemode that the main menu level would use, as if I had gamemode none like this unreal forum said was the solution it would be overridden by the RPG gamemode anyway.

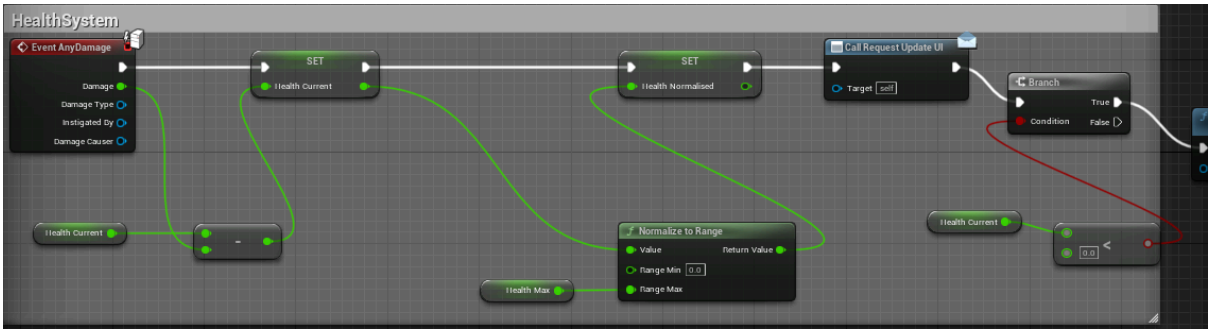
I also had a problem where when I launched the game on the built version my mana widget wouldn't update when using or regening mana, this was a huge issue as it didn't appear in the standalone launcher editor, this took a lot of debugging with print strings at certain points in the event graph of my player character where I init the UI and then the actual widget eventgraph itself this came to no avail, I tried doing get valid for my mana bar and main HUD this came to no avail however the final method i tried to fix this was adding a 0.2 second delay before I initialise the UI in the player character this actually fixed it, which made me realise the issue was that it was loading certain parts of my blueprint up first and because it had no delay it tried launching it up and missed it. Below is a video of the bug happening which is now thankfully fixed.

During the development I had a lot of issues with my animations as I was using a custom mixamo character and custom animations from there, meaning I had to create a a new animation blueprint, having never learnt animation and this is something I wasn't focusing on it was a challenge to get working, and something that half works at best now, if I had the scope or time I would defiantly want to improve on animation blueprint, however I feel that my spell system didn't entirely correlate well with my animations.

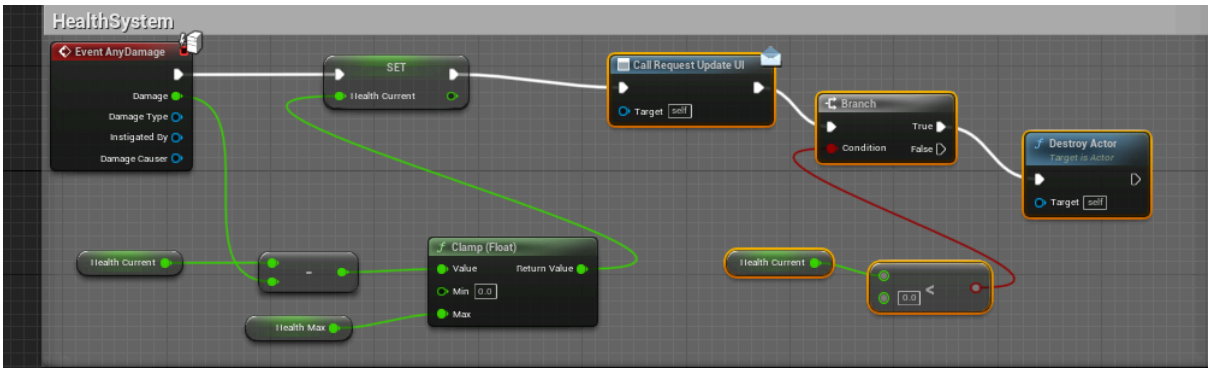
I used the Unreal engine forums to help me figure out my issues but with running out of time and scope, I decided not to move forward with it, but I tried for multiple hours to get it working. https://dev.epicgames.com/community/learning/tutorials/L9wo/unreal-engine-convert-animation-blueprint-to-another-skeletal-mesh-in-ue5

I had issues where my health would go above the max that was set however after debugging and realising what I did wrong, I was using a normalise health float node instead of a clamp float node which after switching fixed my issues so now my healing spells cannot make me go above the max health (e.g. max health is 1500, before clamped node I could heal above it)

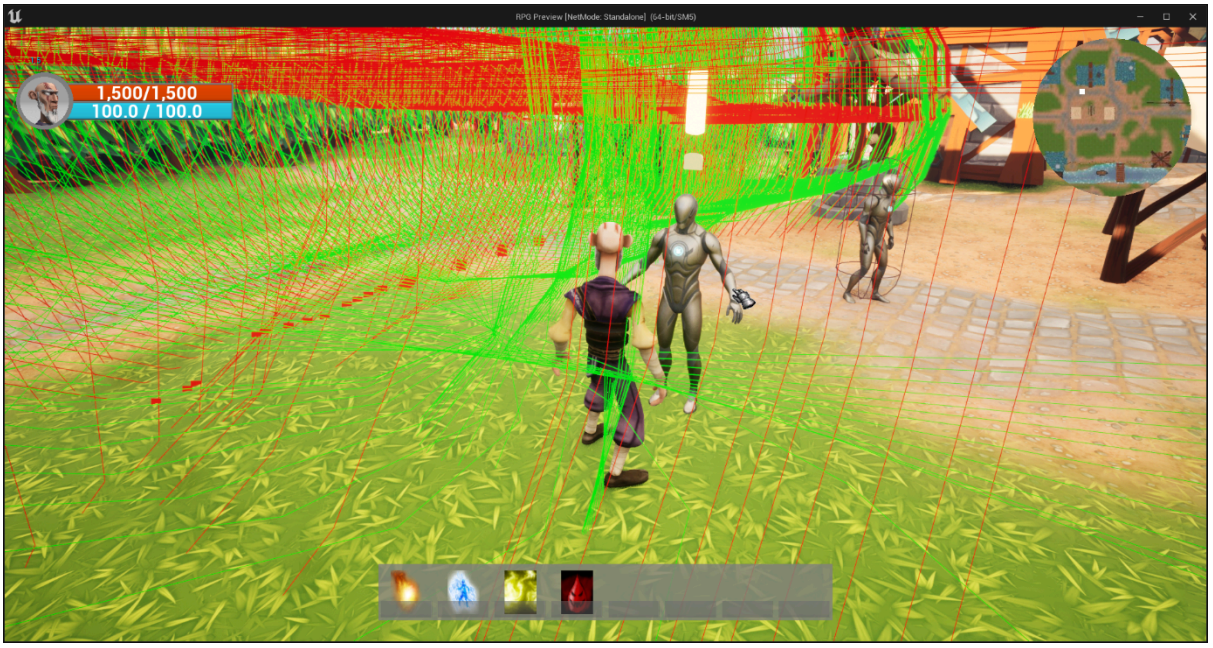
old version is below



new version is below



I was using the sphere trace channel debugging feature to track where my interacts were working and not working, while my interact is still slightly buggy due to my camera boom and movable camera, it works as intended, with more time or for GradX I would aim to fix this, and when critiquing myself against the industry games like World of Warcraft they use a right click on actor to interact, which could be far more efficient than using input action E and using a sphere channel trace.



When I looked at my combat for critiquing myself and to use as feedback to myself, I looked back at at an old combat video I had for world of warcraft with a spell caster which is what my character is (a spellcaster) and played so World of Warcraft so I could compare and critique, while mine is a verticle slice of what this RPG could be and on a bigger budget it could go much further and expansive, I did find that mine defiantly wasn't as fluent as world of Warcrafts however this is expected as a whole team worked on world of warcrafts combat system whereas I worked solo in a timeframe and it would of been out of scope to add a lot of the features World of Warcraft had.

Conclusion Development log progress #10

Conclusion

Overall I think I achieved the goals of what I wanted to create which as a verticle slice of an RPG with fundamental mechanics where I planned to have

- Combat (spell system)
- basic ai
- camera system
- minimap
- Quest system
- Player and enemy bars
- Ability bars
- Levelling up system

Out of all of these the main one I didn't do was the levelling up system where you would level up from level one to say level 5 and each level you got a new spell, this was my intention to create this however I found during development that it was out of scope for me to achieve within the time frame, so I decided to cut it as I didn't want a barebones hardly

working system going in, however I have a remedy for this, I am going to include it ready for GRAD x as I believe I have the time and scope to achieve it within that time frame, however it is a shame I didn't include it as it is one of the fundamental RPG mechanics I am missing in my verticle slice.

I didn't keep to any of my date I had planned to have objectives completed by apart from my camera system, minimap and player and enemy bars, and enemies which were completed on the date due, this was due to issues that arose i had to problem solve, or the priority was moved for a more pressing issue.

Combat

I thought the combat was overall decent and ended up how I wanted it to be however it isn't perfect but shows what it could be in my verticle slice and I learned a whole lot while creating it which was super fun! For example I had issues with spells not working with my mana properly which are mostly resolved and an issue where you can cast even without mana.

Minimap

I am really happy with how my minimap turned out, I achieved this goal and implemented a minimap in the style of how many RPG's like Witcher, skyrim or World of warcraft have it, however due to scope and working solo there were Quality of life features missing like map icons and so on however with more time or scope i could defiantly of added these in.

Enemies

I'm happy with how my enemies were implemented and work how I would like them to, originally i used basic AI blueprint in the enemies event graph however after using unreal 5 documentation, I moved to behaviour trees,blackboards and an AI enemy controller which made my enemies far better, as before they would move to attack player then stop and not follow you again when you moved, now they do.

Animations

While animations were not my focus, it came to my realisation how a spell system would be so animation heavy, this is something I learned from when creating this, I had so many issues during creation of my project with animations as I never really learnt animations before, however with more time and scope I would love to learn animation blueprint properly. I had to scrap certain animations due to the fact that it broke my character and certain spells when used.

Quest system

I am very happy with how my quest system ended out, I used a tutorial to help me learn how to make a quest system so i could use it as a reference but also learn a whole lot more for blueprints which has expanded my skillset in regards to them, as i learn about function library's which is super efficient for storing functions and now know what it takes and is needed to create a quest system, it allows me to efficiently make multiple stage quest of differn't objective types!

Learning Contract				
Aim 1: R&D Process – Resolve all potential issues which I might encounter during the development of my project				
Objectives	**Tasks**	**Resources needed**	**What does successful completion of this task look like?**	**Date Due**
1. Combat	1. Attacking enemies 2. Health & Mana system 3. Floating damage 4. Abilities	1. Unreal Engine 2. Unreal Engine 3. Unreal Engine 4. Unreal Engine	1. Right clicking the enemy auto attacks 2. Make Enemies targetable 3. Working health & mana system for player and enemies 4. Working abilities and floating damage	1. 26/02/2022 2. 28/02/2022 3. 30/02/2022 4. 30/02/2022
2. Basic AI	1. Patrolling AI 2. Attacking AI	1. Unreal Engine 2. Unreal Engine	1. AI should patrol the areas designated 2. Ai should attack and follow player for X distance	1. 05/05/2022 2. 05/05/2022
3. Camera System	**1.** Zoom in and out (locked to X distance) **2.** Rotate around the whole character **3.** Moving with camera buttons	**1.** Unreal Engine **2.** Unreal Engine **3.** Unreal Engine	**1.** You can zoom in and out of the player but locks at a certain distance **2.** You can rotate around the whole character **3.** You can move by holding down both right and left click that would normally control camera	**1.** 07/02/2022 **2.** 07/02/2022 **3.** 07/02/2022 **4.** 07/02/2022
4. Minimap	**1.** Functioning mini map **2.** Player marker on mini map **3.** Map onto minimap **4.** Points of interest	**1.** Unreal Engine **2.** Unreal Engine **3.** Unreal Engine **4.** Unreal Engine	**1.** Make sure mini map is fully functional **2.** A player marker which shows the real location of player **3.** the map area you are in visually on minimap **4.** Points of interest like the quest's objectives or shops	**1.** 10/03/2022 **2.** 15/03/2022 **3.** 10/03/2022 **4.** 16/03/2022
5. Quest System	**1.** Quest tracker **2.** Accept or decline quest (with text)/reward **3.** Working objective **4.** Quest hand in	**1.** Unreal Engine **2.** Unreal Engine **3.** Unreal Engine **4.** Unreal Engine	**1.** Tracks the current quest you are on **2.** Allows you to accept or decline the quest and shows quest text **3.** The quest objective works (e.g. kills 5 mobs) **4.** Can hand in the quest to complete it	**1.** 18/03/2022 **2.** 18/03/2022 **3.** 20/03/2022 **4.** 21/03/2022

Learning Contract				
Aim 2: User interface & experience				
Objectives	Tasks	Resources needed	How is the success fulfilment of the task measured	Date Due
1. Player bars	1. Show health & mana 2. Show player portrait 3. Text. 4. Text.	1. Unreal Engine 2. Unreal Engine 3. Unreal Engine 4. Unreal Engine	1. Show health & mana on a progress bar 2. Show a picture of the character next to health/mana 3. Text. 4. Text.	1. 30/02/2022 2. 30/02/2022 3. Enter a date. 4. Enter a date.
2. Minimap	1. Show minimap 2. Visually easy to read 3. Add to master UI	1. Unreal Engine 2. Unreal Engine 3. Unreal Engine 4. Unreal Engine	1. Show minimap on top right corner of screen 2. Allow users to glance at the minimap with ease to know where they are 3. add the minimap to master ui	**1.** 10/03/2022 **2.** 15/03/2022 **3.** 10/03/2022 **4.** 16/03/2022
3. Quest tracker	1. Display the current quest 2. Easy To read	1. Unreal Engine 2. Unreal Engine	1. Display current quest on a list in right of screen 2. Ensure the font and text size is easy to read 3	1. 18/03/2022 2. 18/03/2022
4. Ability bars	1. Ability bars on player screen 2. tooltips over them 3. ability icons	1. Unreal Engine 2. Unreal Engine 3. Unreal Engine 4. Unreal Engine	1. Display ability bars below player bars 2. Tooltips telling you what ability's do 3. Ability icons to represent what the spell is visually	1. 30/02/2022 2. 30/02/2022 3. 30/02/2022
5. Enemy bars	1. Display health 2. Enemy icon 3. enemy buffs or debuffs	1. Unreal Engine 2. Unreal Engine 3. Unreal Engine	1. Show the enemies health above them with spatial ui 2. Enemies portrait next to their spatial ui 3. debuffs and buffs icons/tooltips below their healthbar	1. 30/02/2022 2. 30/02/2022 3. 30/02/2022

Learning Contract

Aim 3: Play test & fix bugs

Objectives	Tasks	Resources needed	How is the success fulfilment of the task measured	Date Due
1. Play test the main menu & fix if needed	1. Try starting the game 2. Exit the game 3. The main menu is functional and visually looks fine without errors	1. Unreal engine 5 2. Unreal engine 5 3. Unreal engine 5	1. It spawns you into the game 2. It closes down the game to desktop 3. There will be no visual or technical issues with the main menu	1. 05/05/2022 2. 05/05/2022 3. 05/05/2022
2. Play test and fix Combat & stats	1. Test to see if Player can attack and use spells without issues 2. Test to see if Health and mana updates properly 3. see if tooltips display right	1. Unreal engine 5 2. Unreal engine 5 3. Unreal Engine 5	1. If bugs are found then I would proceed to fix them if successful then I will leave be 2. Health and mana should update properly and if no mana then you can't cast spells or if you reach 0 health you die, if bugs occur, I will fix them 3. if tooltips don't display correctly, I will fix this	1. 05/05/2022 2. 05/05/2022 3. 05/05/2022 4. 05/05/2022
3. Play test and fix Minimap	1. Test to see if the minimap is displaying properly 2. Test to see if the mini displays the player properly 3. test to see if the point of interests display properly	1. Unreal engine 5 2. Unreal engine 5 3. Unreal engine 5	1. The minimap should show on the players viewport correctly if not I will fix this in the blueprints/widgets 2. The player icon should appear on minimap if not I will fix this so it does 3. the point of interests should display properly if not I will fix any bugs I encounter	1. 05/05/2022 2. 05/05/2022 3. 05/05/2022 4. 05/05/2022
4. Play test quest tracker	1. Test to see if players can talk to the NPC or bounty board for the quest 2. Test to see if you can decline and accept the quest 3. Test to see if you can complete the objective of the quest (e.g. 5 boars) 4. Test to see if the hand in for the quest works	1. Unreal engine 5 2. Unreal engine 5 3. Unreal engine 5 4. Unreal engine 5	1. The player should be able to talk to the NPC/bounty board for quests if not I will need to fix the blueprint bugs for this. 2. The player should be able to accept or decline the quest, I will test both scenarios to see if any issues arise then fix it. 3. You should be able to kill for example 5 boars and the quest be complete and then can be handed into the quest giver, if any bugs arrive I will fix these. 4. You should be able to hand in the quest and receive the reward, if not I will find the issues and fix this	1. 05/05/2022 2. 05/05/2022 3. 05/05/2022 4. 05/05/2022
5. Play test against AI	1. Test to see if the AI patrols a set area 2. The AI should be attackable and attack back 3. The AI should be able to die and give you XP	1. Unreal engine 5 2. Unreal engine 5 3. Unreal engine 5	1. The AI should patrol the area if successful if not I will fix this depending on the bug that arises, I could see it be potentially being collision that affects their path 2. The ai should attack the player and be attackable, if not I will fix this, however I could see it happening if theres an error in what the AI should target/player. 3. The AI should die and perhaps respawn after X time and give the player XP, if not I will work to fix this.	1. 05/05/2022 2. 05/05/2022 3. 05/05/2022

- Very basic AI (patrolling /attack) which will be the enemies the player character will kill for XP or quests.
- Basic level up system which is core to the RPG system (3 levels 1 ability per level)
- Minimap which will display player location and points of interests
- 1 or 2 basic quests which will have the player kill mobs or collect items to hand in.
- Basic combat/abilities (one class for scope as it could get very complex which I will investigate into further down the R&D)
- Health and mana bars/ability bars which will display the players resources at hand.
- Main menu which will allow the user to exit and start the game.

I used github to store all of my work on so I could push builds and and pull them from various machines easily and efficiently like how they do in industry, also it allowed me to have an easy way to have backups of my projects.