The Tower of CATastrophy

Or *Jordon Grahmsay's kitten nightmares*

Oh no ! The cat cannon has gone rogue, and kitties are falling from the sky!
Let's put them on the balance tree over there, but watch out, they can't touch the ground and cause mayhem in the room!

Pitch

The *Tower of CATastrophy* is a physics-based puzzle game where you have to manage falling cats on both parts of a scale while scoring as many points as possible. To help with that, you unlock new cats that have special abilities as you gain score.
Each game would last 1 to 15 minutes, depending on player performance.

The game is composed of a short gameplay loop. The player has to sort falling cats from the sky in the 2 plates of a scale. If the cats fall, they lose the game.

The goal is to gain as many points as possible.

Inspirations : Tricky Towers, Suika Game, Battle Cats, Cook Serve Delicious!

Target Audience

The game would be targeted toward a casual audience that has a short amount of time to play games. The game would be best suited for children starting at 6 to 14 years old, and for young adults from 19-30 years old.

The game would fit web platforms like Itch, Windows platforms like Steam, mobile platforms such as Google Play and the IOS App Store, and portable consoles like the Switch.

Game loop

The game loops around in a short 60 second round.
The cat cannon launches kittens in the sky that fall down faster as time goes on.
The player has to pick the falling cats and put them on one side of the scale.

Most cats have a special effect that applies either when colliding with other cats, when being picked up, or when a round ends.
If a cat falls at the bottom of the screen, the scratch-o-meter fills up.
When the timer runs out : all cat's end of round effects activate, then there is a small score recap and the ga-chat-pon activates, then the player chooses which cat will spawn on the next round. The scratch-o-meter will be lowered by 80%.

The game ends when the scratch-o-meter is full.

Each cat that falls off screen after the end of the round will not increase the scratch-o-meter !
Starting at round 15, the game becomes exponentially harder, in order to stop the player for playing for too long

Time increment

The game gets harder after every round and after a short period of time.

The time increment is a variable that will increase the difficulty of the game. It will affect the cat cannon spawn rate and falling speed.

Its starting value is 1.
Every 15 seconds survived in a round, the time increment will increase by an increment of 0.25.
Every round survived adds a base
The scratch-o-meter has a small impact on the time increment, making it so the game is easier when the scratch-o-meter is nearly full, and harder when it is empty.

Formulas :
catOMeterVariance = 0.25
catOMeterValue is a value from 0 to 1 according to the amount of cats in the scratch-o-meter.
incrementRate = 0.25
BaseTimeIncrement = 1 + floor(RoundTimer/15) * ((roundsSurvived+1) * incrementRate)
FinalTimeIncrement = BaseTimeIncrement * lerp(1+catOMeterVariance,1-catOMeterVariance, catOMeterValue)
Example : At the start, the timeIncrement value is equal to 1. After 65 seconds, the value would be equal to 1 + 4*0.25 = 2. After 5 rounds, and at 80 seconds, this value would be 1+ 5*(5*0.25) = 7.25.

Values are subject to be tweaked, but should stay modular through a ScriptableObject.

The cat cannon

It's raining cats !

The cat cannon is at the core of the great scale tree. It will fire cat spheres at the top of the screen, at about 3 screens of height.
The cat spheres have an ever increasing velocity, and break :
- When the player interact with them
- When they touch the scale or the other cats (not other bubbles)

Their velocity is randomized when shot, between a range increasing after each 15 seconds of a round.

The formula is :
baseVelocity = baseValue + timeIncrement * roundIncrementValue,
velocity = random(baseVelocity, baseVelocity + spread)

The cat spawn rate starts at 5 seconds for the first round, and then is reduced by the timeIncrement.

minimumSpawnTimer = 0.5
CatSpawnRate = minimumSpawnTimer + (baseSpawnRate-minimumSpawnTimer) / FinalTimeIncrement
Values are subject to be tweaked, but should stay modular through a ScriptableObject.

The design is inspired by DIY flipper mechanism to launch balls.
The Cat cannon shoots at the speed of the music, matching it's ever increasing BPM.

Fall indicator

Cats fall down from about 3 screens of height. As they fall down, an indicator at the top of the screen increases in scale as the cat bubble gets closer.

The great scale tree

It's just a cat tree, right?
The scale tree is composed of 2 platforms,and the cat cannon in the middle.
The two platforms are located on the left and on the right of the screen, and are linked together like a classic scale.

Figure 1. A justice scale

As the game goes on, cats will fall down on either platform, which will be lowered according to the cat weight.

Cats have a base weight, and have a specific weight multiplier depending on each cat's shapes and abilities.

The cannon loading phase

After the end of a round, new cats will be rolled. The amount of cats rolled will increase after 2,5,8,12,15 rounds, starting at 4 different cats and ending at 9.

These cats will spawn on the next round, until another set of cats is rolled.

Rare rolls

As the rounds increase, the chance of rolling rare cats increases. At the start of round 6, fancy cats are able to spawn.

Score

While progressing in rounds, the player will gain score. All score gained will make the player progress through levels. The goal of the game is to get as much score as possible.

The player can increase their score by placing cats on the scale.

At the end of the round, the player gains score for each cat still on the screen, then the cat's end of round effect applies.

Score formula

RoundScore += CatPlacedScore

*EndOfRoundScore = catsOnPlatform * catMultiplierSum*

TotalRoundScore = (RoundScore + EndOfRoundScore)

GameScore += TotalRoundScore

Leaderboards

At the end of the game, a leaderboard will be displayed with three pages for top daily scores, all time scores and an accessibility mode score. (see Accessibility section later)

The leaderboard is also available in the main menu after having played one game.

Cat galore

Common cats :

Common cats do not have specific powers. Minimum of 1 per round !

The Cat: Square cat.
Ball of fluff: Round cat with a flat bottom, very fluffy !
Flatty : very flat.
The Hisser: has a bridge shape

Rare cats :

The red & white demons : Hate each other ! Will meow aggressively and cause mayhem if they are on the same side as one cat of the opposite color.

Icy cat : is slippery, will fall easily if left unattended!

Trouble Maker : will move a little bit to the left and the right, which will make the tower unstable

Angry kitty : Cannot be picked up for too long before it starts biting your fingers!

Huge Chonk : Is big. Very big.and very heavy. (3x the size and 2x the weight of other cats)

Lil kitty : is so tiny and light you could miss it!
The Slowpoke : Such a lazy cat, they sleep all the time…

EPIC CATS ? :

Box cat : When dropped down the first time summon a huge box that entraps nearby kittens
Sticky cat : will stick to every other cats, and on the scale
Catsploder : At the end of the round, trigger a catsplosion, propelling nearby cats.
Merging cat : Will merge with the first cat it touches.
Ghost cat : Will disappear at the end of the round

FANCY CATS ????!!!!? *(fancy cats just a suggestion)*

Fancy cats have a very powerful effect, changing the flow of gameplay drastically. Maximum of 1.

The buccaneer : increase the spawn rate of cats by 200%
Cat king : Magnet effect around nearby cats
Small void : Will absorb 10 cats before disappearing
The Cat wall : very tall (6 times the size of a normal cat), and can't move after being placed.
The bouncer : when on the scale, every cat that falls down will bounce once.
The chef: Cat food will fall from the screen, and you can pick it up and feed it to cats. Cats fed that way will increase in size and add bonus score.

Interface

Camera

The camera has a puzzle game side view, as in arcade classics such as Tetris, Puyo-Puyo, Peggle.

Figure 2. Capture of the original Tetris Game

Controls

In rounds

The player has the ability to do 4 actions in rounds :
- Pick up a cat
- Move the picked-up cat
- Rotate the cat
- Drop the cat

Their control scheme and platform may vary, but these actions will stay the same.

Control Scheme	Targeted platform	Action name	
GamePad	PC, Consoles		
		Pick up	East button press while above a cat
		Move	Left Joystick, D-Pad
		Drop	East button press with a cat selected
		Rotate Counter Clockwise	Left bumper 1 (while holding a cat)
		Rotate Clockwise	Right Bumper 1 (while holding a cat)
Mouse	PC		
		Pick up	Left mouse click(hold) while above a cat
		Move	Mouse (move)
		Drop	Left mouse click(release) with a cat selected
		Rotate	Right click (while holding a cat)
Keyboard	PC		
		Pick up	E key, Space key, Enter key press
		Move	Arrow keys, WASD

		Drop	E key, Space key, Enter key press
		Rotate	A key, 0 key
Touch screen	Mobile Devices		
		Pick up	Finger hold near a cat
		Move	With a cat : Drag across the screen
		Drop	Finger release with a cat selected
		Rotate	Touch anywhere on the screen while holding a cat

Table 1. Control schemes for the round s

Additional note: for Gamepad and keyboard, the move action should be fast and be able to traverse from the bottom to the top of the screen in 3 seconds.

In menus

The more input intensive menu is the end of the round cat selection screen. The player can input different actions :

- Skip dialogue prompt / Start next round / Select a cat (*Interact*)
- Menu navigation (For keyboard and consoles)
- Pause menu (For keyboard and consoles)
- Switch leaderboard : Swipe the leaderboard tables left or right for the different rankings

Control Scheme	Targeted platform	Action name
GamePad	PC, Consoles	

		Interact	East button
		Menu navigation	Left Joystick, D-Pad
		Pause	Start button
		Switch Leaderboard	Right & Left bumpers
Mouse	PC		
		Interact	Left click
Keyboard	PC		
		Interact	E key, Space key, Enter key press
		Menu navigation	Arrow keys, WASD
		Pause	Escape key
		Switch Leaderboard	Arrow keys, WASD
Touch screen	Mobile Devices		
		Interact	Tap
		Switch Leaderboard	Swipe or touch arrows

Table 6. Control scheme for menus

Additional notes:

For the keyboard and gamepad control scheme, in menus, the cursor is locked on interactive elements.

Sound

Sound list :

Sound name	Use
Ui accept	When clicking on a button or pressing the accept action(selecting a cat in menus, starting game, …)
Ui move	When moving between different buttons in the menus, or when selecting a button with the mouse
Ui invalid	When doing an invalid action, like putting an invalid cat type in the cat cannon selection
Dialogue speech	Short sound when a letter or short syllabus are spoken by the cat professor
Level up	Jingle when the Level bar is full
Score increment	Slider sound when the score is added to the Level bar
Score pop up	At the end of the round, small score popup will appear at each cat's location
Cat approaching	Pop up sound when the cat bubble indicator is appearing
Cat picked up	Sound when a cat is selected (specific to each cat)
Cat colliding	Sound when a cat is colliding on the platform or other cats (should not be very intrusive, soft)
Game over (Win)	Played at the end of the 5 rounds.
Game over (Lose)	Played when the scratch-o-meter is full

Table 11. List of sound effects and their use in the game

Ui navigation sounds must be satisfying to hear and sound natural. Wooden sounds, metal sounds,

Cat noises are important to gauge each cat's personality, but must be short (0.5-1 seconds) because they will be heard often by the player. Some randomness could be added with a small variation of pitch.

Sound effects inspiration : Wildfrost, cats

Music

The music is composed of 2 loops (2 / 3 minutes) :
- One upbeat, energetic music, meant to provide a sense of urgency to the player.
- One with slower tempo and tranquil vibes, with a more melodic use of a leitmotiv, with softer (guitar/piano) instruments used for background loop used for menus

The loops would blend between each other and keep the bass between each other.
The music would become more hectic as time in the round goes on, then abruptly stop once the timer runs out, then go back on a background loop on the menus.

The tempo of the music should fit the TimeIncrementValue, and go faster after time goes on. The cat cannon fires at a set interval, which means that it could be linked to a bass kick in the music in order to add a more rhythmic and pleasant feel. This could be the same with the animations.

Music Inspiration :
Pizza Tower, A Hat in time (Collapsing Time Rift :
https://www.youtube.com/watch?v=fAOn6xZy3FE)
 Cook serve delicious 3 : https://www.youtube.com/watch?v=6nlsdu6N5d8 (calm loops example: 41:00, 58:00, , fast/ stressful moments example:12:40, 1:04:30
Also see how In Wildfrost the music transitions from a very calm loop into a faster paced combat one, that have 3 states (calm, battle, boss) :
https://youtu.be/oqwrZS8qmIg?si=b5wH6e8XKqFGN0T2&t=219 from 3:39 to 6:12
https://www.youtube.com/watch?v=6Q-FbLviSu4 : The music in microworks increases in speed after each round

Screens and menus

The game is divided into 2 principal menus and 7 sub interfaces. Wireframes are available in the addendum section of this document.

Principal menus

Main Menu:

Contains the Start Game, Collection, Options, Leaderboard and Credits button.
To familiarize the player with the controls, a playground is available at the right of the screen. Common cats fall like in a real round at a slow pace, and the player can interact with them and the scale.

Inspirations : Backpack battles Main menu

Game scene:

The game scene contains everything related to the real time core game loop.

Sub interfaces:

- Leaderboard
- Pause Menu
- Settings menu
- Collection
- End game Screen
- Cannon rolling phase
- Credits

Tutorial : The Cat Purr-fessor

I will be your guide in these trying times
The cat purr-fessor's goal is to guide players through their first games. They act as the tutorial and teach the player how to move cats, how to navigate the game interface, and load cats in the cannon.
For the first game, the cat would introduce :
- The two sides of the scale
- A falling common cat that the player has to pick up put on a side of a scale
- The fact that the scale now moves towards the heavy side
- The round timer

After the first round :
- The cannon roll system

After the start of the second round :
- The scratch-o-meter and the lose condition

The game would pause between the professor's dialogue, until the player press the accept action.

When hovering on a cat in the cat selection screen, a small gif will be played in a bubble above the professor's head.

Accessibility Settings

These settings are meant to make the game slower paced or faster paced depending on the player's liking. Modifying some of these settings will put the player's score on a different Accessibility leaderboard.
Options marked with a **!** will move the player's ranking to Accessibility mode.
- Unlock all cats : Unlock all catalogue stickers.
- No death mode **!** : when the scratch-o-meter is full, the board explodes but the game does not end.
- Sticky cats **!** : All cats are sticky (like the epic sticky cat), and keep their original powers as well. Meant to make building huge towers easier
- Common cats only **!** : No cat selection, but all the common cats are loaded in the cat cannon.
- Round timer **! :** Increase or decrease the duration of a round.
- Cannon Speed **!** : Increase or decrease the speed at which the cannon shoots and the cats fall(Time Increment Value).

- Immovable scale **!** : Makes it so the two platforms stay in the middle despite weight constraints.

Game Art: Intended style

The game is meant to have a cute, 2D art style, with a pastel toned background, and outlines around cats and platforms.

For the menus, a journal style, or a more abstract style could be used.
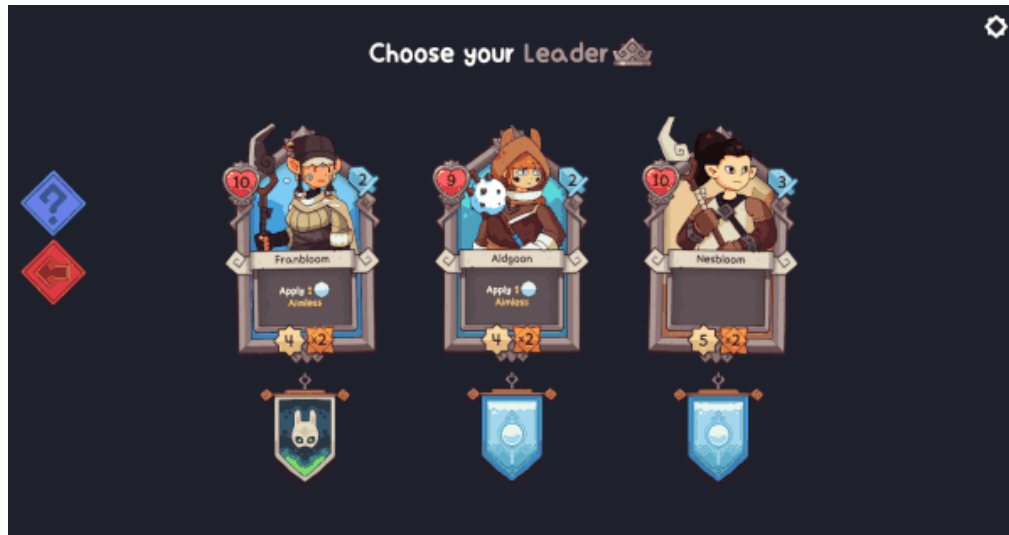
Inspirations :

https://play.google.com/store/apps/details?id=com.pank0.usagishima

Figure 5. Leader selection and character animation in wildfrost

Risks and challenges:

The Tower of CATastrophy is meant to be a laid back casual puzzle game with some strategic elements and variety. However, there are some risks to be taken into account:

- *The physics is jittery, and it is not fun to stack cats as it is too precise or too unstable* : Some ways to solve this would be either to reduce the cat amount on the screen at once, or increasing physics parameters in unity at the cost of some performance. The physics may also behave differently on some platforms like web or mobile.

- *The scale mechanic makes the game too hard:* Having the playground moving while placing objects either bounce everything too unpredictably, or is too unforgivable.

- *There is not enough cat choices, and not enough variety between rounds :*
  This could either be solved by reducing the number of rounds, or by removing the round systems and putting all the cats at once. The issue with that would be that it would be harder for the player to react to new cat types
- *Some cats are harder to use than others, or break the balance of the game :*
- *The cats are too unpredictable :* It is too hard for a player to understand what a cat does before playing, which leads to unpredictable and frustrating outcomes for their cat towers. The tutorial system and video preview system is meant to solve this issue, but if the game is viewed as too confusing it may be required to make a bigger tutorial introducing each cat slowly, or tone down the craziness and uniqueness of cats abilities.
- *The game is too hard to use on controllers :* Moving the cursor feels too slow and is frustrating to use. A slider for cursor speed in the options could help with that issue, or having more lenient hitboxes for the cats in bubbles.
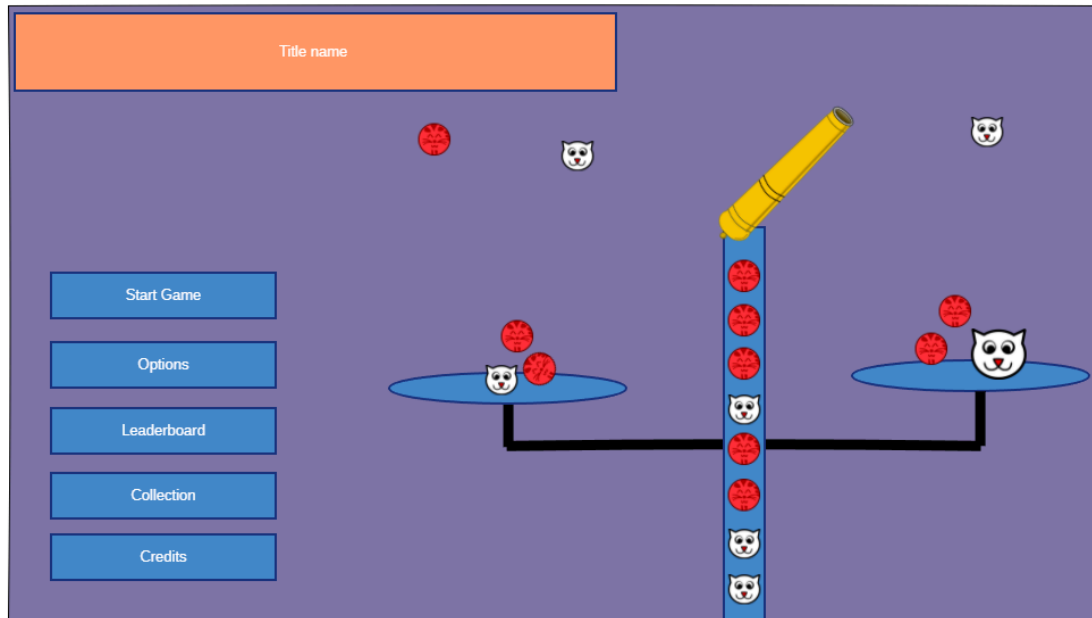
Challenges :

- The main challenge is to make a game that remains fun, but with a medium to high skill ceiling. A beginner should be able to play until round 7 to 8 after one or two games. At later rounds, the game must not feel to rng dependant with the cat rolling system.
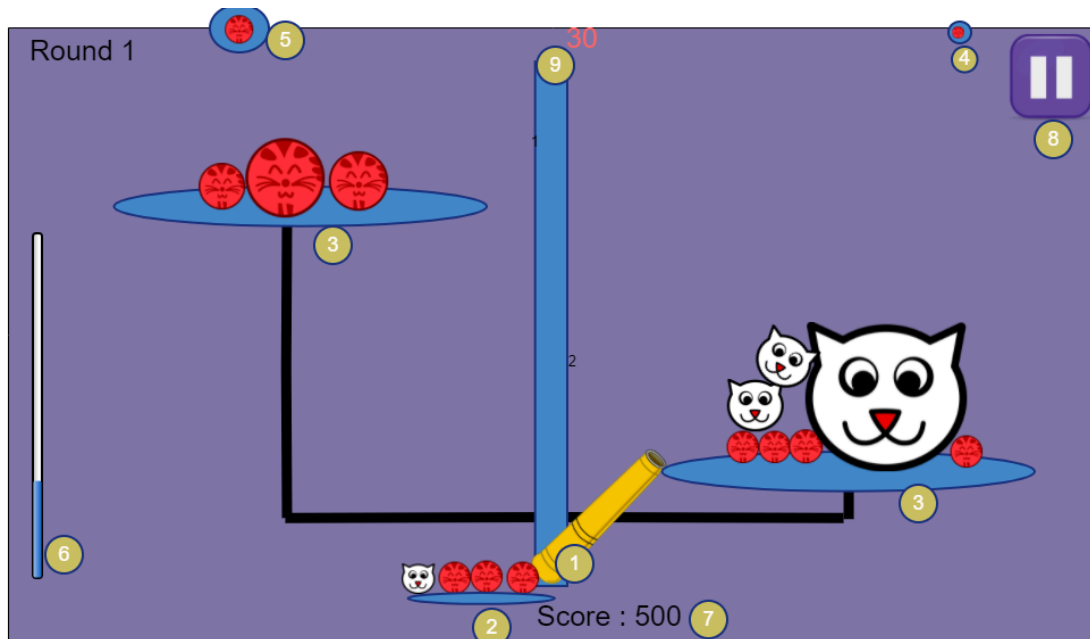
Addendum

Interfaces

Main Menu

Game Scene

1 : The Cat Cannon. Rotate Left or Right randomly and shoot a cat
2. The Cat Launcher. Here are shown the next cat that will be launch. Works like a pinball launcher
3. The cat scales. Moves upwards or downwards depending on the weight on them
4. The cat bubble indicator. Every cat launched from the cannon take time offscreen to fall down.
5. Cat bubble indicator V2. The closer the cat bubble is from the board, the bigger it gets.
6. The Cat-o-Meter : Increases when a cat fall down. When it is full the game ends on a loss.
7. Score meter : Increases after each score update (placing a cat, or end of round effects and bonuses)
8. Pause menu
9. Round Timer

Pause Menu

Paused...

Resume

Options

Collection

Exit
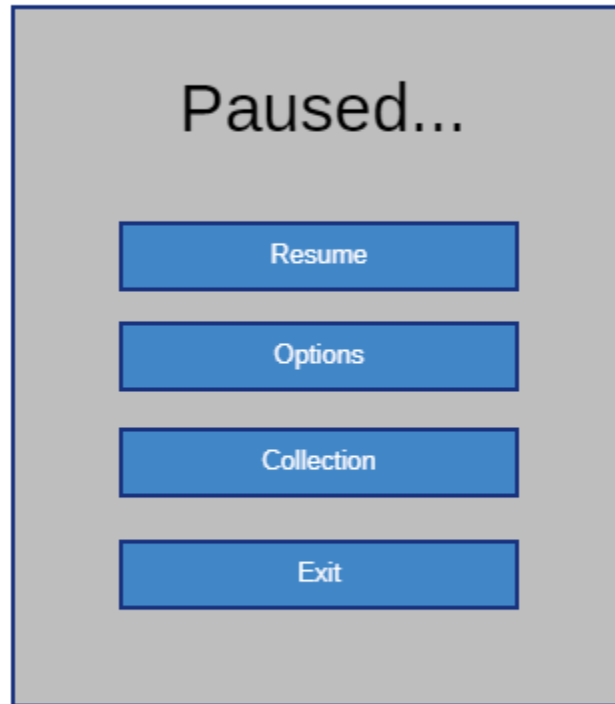
End game Screen

Victory / Defeat !

You survived a total of x Rounds

1	Player Name	999999
2	Player Name	999999
3	Anonymous	999999
4	Player Name	999999

3562 Enter name here....	123456

Statistics

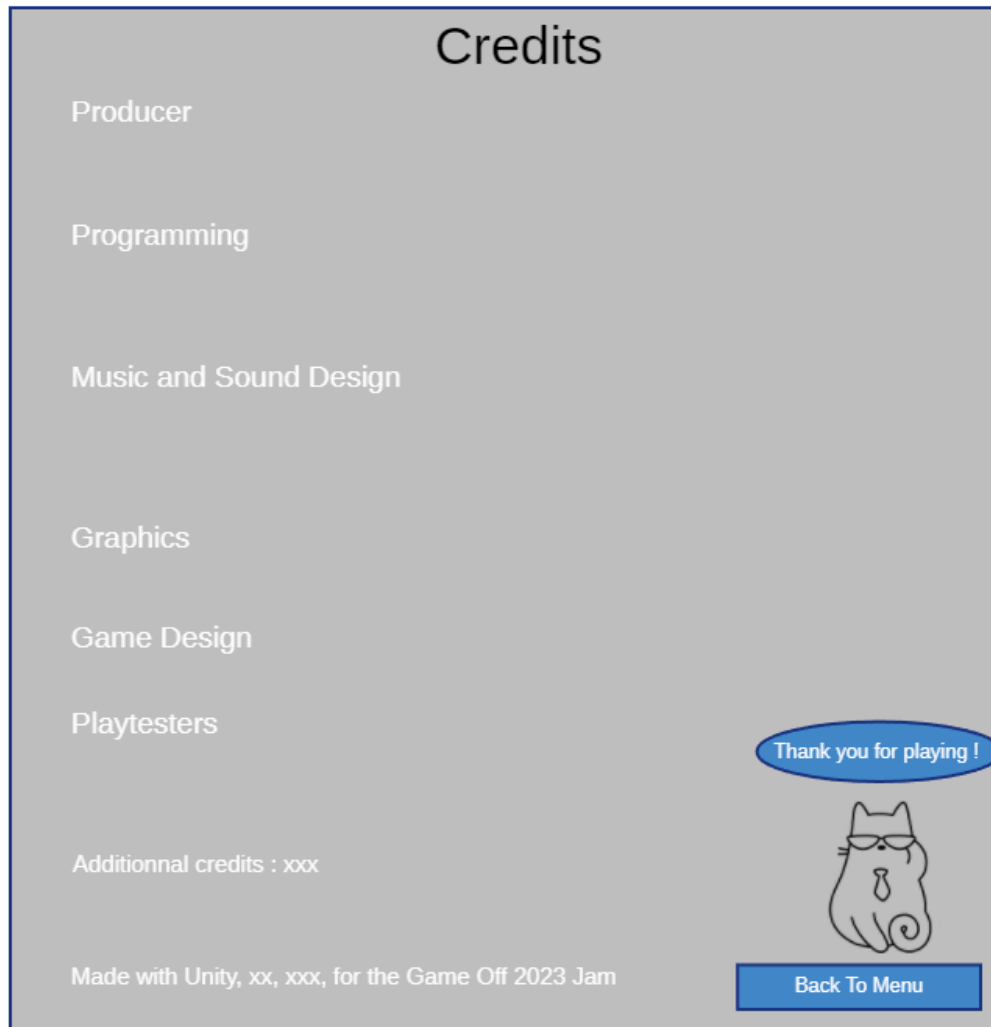|	
Cats placed	300
Cats Fallen	5
Cats unlocked	10/20

Thank you for playing !

Credits	Back to menu

Credits Screen

Credits

Producer

Programming

Music and Sound Design

Graphics

Game Design

Playtesters

Thank you for playing !

Additionnal credits : xxx

Made with Unity, xx, xxx, for the Game Off 2023 Jam

Back To Menu

Settings Menu*

Settings

Audio

☐ Mute all Sound

Accessibility (Will disable Daily and All time ranking !)   Reset

☐ Unlock all cats   ☐ Common cats only

☐ Brighter indicators   Round Timer (90 seconds) ▾

☐ No Death mode   Cannon Speed (x1) ▾

☐ Sticky cats   ☐ Always Randomize cats

General

☑ Tutorial prompts

Reset Tutorial

Delete progress

Back

* Ideally we should aim to have further accessibility available in the settings, such as the option to edit the font size, or a toggle for high-contrast -- note from Charlie

Leaderboard Screen

Leaderboard

	Daily Ranking	
←		→

1	Player Name	999999
2	Player Name	999999
3	Anonymous	999999
4	Player Name	999999
5	Player Name	999999
6	Player Name	999999
7	Player Name	999999
8	Player Name	999999
9	Player Name	999999
10	Player Name	999999

3562 Enter name here....	123456

Back to menu

Cat rolling phase

Load the cannon...

Current selected cat description

New!   New!

Go !

1. The cat professor : cute moral support and tutorial
2. The Cat Collection: contains all the locked and unlocked cats information.
3. Cat rolling animation
4. Cats that will spawn on the next round
5. Current hovered cat video
6. Current hovered cat description
7. Start round button (could be cannon shaped)
8. Pause menu