Reference #	Feature Name	Top Level Description	Priority	Risk	Comments
F001	Character Selection System	Players choose characters with different starting weapons.	High	Balancing characters' initial capabilities.	

Design Brief:

The Character Selection System enables players to choose from a diverse roster of characters, each equipped with unique starting weapons and attributes. This feature directly impacts the player's initial gameplay strategy, fostering a sense of agency and personalization. By tailoring the early game experience to their preferred playstyle, players are encouraged to explore different characters and their abilities, ensuring replayability and engagement.

Design Specification:

When the player clicks play from the main interface of the game to enter the character selection interface, there will be the name and thumbnail of the character on the left side of the interface. When the mouse selects one of the characters, the character will appear in the middle of the screen with his corresponding appearance animation. At the same time, the right side of the screen will appear from top to bottom with the character's name, occupation, health and other information and introductions of the character. At the same time, at the bottom of the information bar, there will be the character's weapon. When the mouse hovers over the weapon thumbnail, the weapon-related information will appear, and ensure that each character can equip the starting weapon immediately after entering the game. When selecting a character, visual and audio confirmation is required, such as the highlighting of the selection box and the sound of the click. At the same time, there is a button to jump to the memory shard below the character model in the middle.

F002	Combat System	Melee and Ranged combat system, with unique initial weapons.	High	Requires extensive balancing and animation.	Core combat system.
F002a	Melee combat system	One original weapon belong to this system with unique attack animation set	High		
F002b	Ranged combat system	One original weapon belong to this system with unique attack animation set	High		

Feature F002: Combat System

Design Brief:

The combat system of this game is quite simple. Overall, the system is roughly divided into two parts. One is melee attack, and the other is ranged attack. At the same time, the types of attacks can be divided into heavy attack and light attack. Heavy attack sacrifices attack speed to obtain higher damage, while light attack uses a faster battle rhythm to make up for the disadvantage of low damage. Players need to combine these two different combat styles according to different maps and different enemies to win the battle. In the combat system, we

need to constantly balance the values between each combat type and combat style, so that each weapon has its own combat combo and suitable combat style. Players can freely customize the buttons in the setting options according to their preferences.

Design Specification:

Attack Types (Base Damage):

- **Melee Attacks:**
  - Light melee attack:
    - **Damage**: 10–20 points.
    - **Attack Speed**: ~1.5 attacks per second.
    - **Combo Limit**: Up to 3 hits in a sequence.
  - Heavy melee attack:
    - **Damage**: 25–50 points.
    - **Attack Speed**: ~1 attack per second.
    - **Combo Limit**: Limited to 1 hit before reset.
- **Ranged Attacks:**
  - Light ranged attack:
    - **Damage**: 5–15 points.
    - **Projectile Speed**: Fast.
    - **Ammo Consumption**: 1 unit per attack.
  - Heavy ranged attack:
    - **Damage**: 20–40 points.
    - **Projectile Speed**: Slower.
    - **Ammo Consumption**: 3 units per attack.
    - **Charge Time**: 1.5 seconds before release.

Combos reset if: There is no input within 1 second after the last attack.

The combat system needs to pay attention to the animation transition between each attack action. At the same time, if you click on a light attack immediately after some characters move, or if you move the character immediately after a light attack, you can cancel the animation backswing. However, the heavy attack animation cannot be canceled once it is initiated. At the same time, there needs to be damage feedback. Visually, the enemy will retreat after being hit, and there needs to be a special sound effect to represent that the attack hits the enemy.

10	F003	Item System	Includes boss skill buffs, memory shard, and skill subsystems	High	Designing the subsystem and rewards for progression.	
11	F003a	Boss skill buffs system	Breakdown boss skill system to swicth it to buff character's weapons	High	Need balancing the exact buff value, and need extra animaion	
12	F003b	Memory Shard system	When character unlock more story about them, they will unlock the memory shard	High		
13	F003c	Skill System	Players unlock skills by discovering memory shards.	Med	Implementing skill trees based on shards may be complex.	

Sub-Feature F003a: Boss Skill Buff System

Design Brief:

This system provides in-game buffs for your skills or weapons after defeating a boss, and these buffs can be stacked. Buffs include enhanced attack damage, attack speed or some other special effects. Players should clearly see the effect of the buff in the user interface, both visually and numerically. This system increases the player's combat ability, reduces the difficulty of subsequent levels and maps, and increases the player's strategic depth, allowing players to develop more genres.

Design Specification:

1. **Buff Acquisition:**
    - Players receive a buff immediately upon defeating a boss.
    - The buff is tied to the boss's theme or skill set and persists permanently.
2. **Buff Types:**
    - **Stat Buffs:**
        - **Damage Increase:**
            - Value**:** +10% damage for all weapons.
            - Example: Base weapon damage = 30 → Buffed damage = 30 × 1.1 = 33.
        - **Health Increase:**
            - Value**:** +20 max health.
            - Example: Base health = 100 → Buffed health = 100 + 20 = 120.
        - **Speed Boost:**
            - Value**:** +10% movement speed.
            - Example: Base speed = 5 units/second → Buffed speed = 5 × 1.1 = 5.5 units/second.
    - **Elemental Buffs:**
        - Adds elemental damage to weapons:
            - **Fire Buff:** +5 burn damage per second for 3 seconds after each hit.
            - **Ice Buff:** Slows enemies by 30% for 5 seconds.
            - **Poison Buff:** Deals 10% of the enemy’s max health as damage over 5 seconds.
    - **Passive Abilities:**
        - **Critical Hit Chance:** +5% chance for critical hits dealing 2× damage.
        - **Stamina Regen:** Stamina regenerates 20% faster.
3. **Stacking Buffs:**
    - Buffs stack additively or independently depending on type:
        - Example: Two bosses each grant +10% damage → Final buff = 30 × 1.1 × 1.1 = 36.3.
    - Elemental buffs are additive across all weapons but do not stack the same effect on the same target.

After the player defeats the boss, the reward animation and sound effects will be triggered. Three different glowing icons representing the boss's buff effects will pop up on the screen, and each icon has a detailed description of the effect. Clicking one of them represents the player's choice. After the selection is made, a prompt window will pop up on the screen to remind the player what effect has been buffed, and the buff will be added to the main menu.

Sub-Feature F003b: Memory Shard System

Design Brief:

The Memory Shard system is a mechanism for accumulating progress and character stories, designed to allow players to learn the background stories of specific characters while unlocking character skills. Each character has five memory shards, and unlocking them will reveal everyone's backstory. These fragments are related to tasks such as defeating enemies, completing the game, or performing specific game operations. We believe that the existence of this system can encourage players to explore the background stories of different characters while providing character skills that are helpful for game progress.

Design Specification:

1. Each character has 5 unique missions, each tied to a memory shard.
2. Examples of missions include:
    - **Mission 1:** Complete the game once using the character.
    - **Mission 2:** Kill 200 enemies with the character.
    - **Mission 3:** Die 30 times while playing as the character.
    - **Mission 4:** Use the character’s special ability 50 times.
    - **Mission 5:** Deal a total of 10,000 damage in battles.
3. Once a mission is completed, the corresponding memory shard is unlocked.

Shard Presentation:

- Locked shards are shown as dimmed or grayed-out icons with a hint about the mission required to unlock them.
- Unlocked shards are fully visible, accompanied by text or animations revealing the memory fragment.

Rewards for Unlocking Shards:

- Narrative Reward: Each shard reveals a piece of the character’s backstory.
- Gameplay Reward: Unlocking shard for a character grants a unique cosmetic or passive bonus.

Progress Tracking:

- Players can track their progress towards each mission in the "Memory Shards" menu.
- Progress bars or counters indicate how close the player is to completing a mission.

Shard Unlock Notification:

- Upon completing a mission, a notification pops up on the right up corner:
- The memory shard icon lights up, and the shard's content becomes accessible in the menu.

Sub-Feature F003c: Skill System

Design Brief:

The skill system is a system that is linked to the discovery and unlocking of the memory shard system. Each character has 2-3 active skills and 2-3 passive skills. Each skill is unlocked by acquiring the associated memory fragment. These skills cannot be upgraded or modified through the game and remain in their original state throughout the game. The skill system emphasizes the specific abilities of the characters, which are related to memory fragments and story narration. Active skills provide tactical advantages in combat, while passive skills strengthen a character's initial performance.

Design Specification:

1. **Skill Types:**
    - **Active Skills:**
        - These skills are triggered by the player during combat and have cooldowns.
        - Each character has 2-3 unique active skills, unlocked by specific memory shards.
        - Examples:
            - **Fireball:** A ranged attack dealing AoE fire damage.
                - **Damage:** 100 base damage + burn effect (5 damage/second for 3 seconds).
                - **Cooldown:** 10 seconds.
            - **Defensive Shield:** Blocks all damage for 3 seconds.
                - **Cooldown:** 15 seconds.
    - **Passive Skills:**
        - These skills automatically enhance the character's stats or provide special effects.
        - Each character has 2-3 unique passive skills, unlocked by specific memory shards.
        - Examples:
            - **Resilience:** Reduces all incoming damage by 10%.
            - **Quick Reflexes:** Increases movement speed by 5%.
2. **Skill Unlock Mechanism:**
    - Each skill is tied to a specific memory shard.
    - Unlocking a memory shard immediately unlocks the corresponding skill.
3. **Skill Limitations:**

- Skills cannot be upgraded or modified after being unlocked.

4. **UI Integration:**
   - A "Skills" tab in the character menu displays all available skills, including locked ones.
   - Locked skills are dimmed with a description of the memory shard required to unlock them.
   - Active skills have clear cooldown timers displayed during combat.
   - Passive skills are listed with their effects in the "Skills" tab.
5. **Combat Integration:**
   - Active skills are mapped to specific buttons.
   - Cooldown timers are visually displayed on the UI, either near the skill icon or as an overlay.

F004	Boss Battle System	Includes general AI and NPC AI, checkpoints and death system, with rest zones.	High	Requires tuning boss encounters and balancing difficulty levels.	
F004a	Checkpoints	Layer-based checkpoint system with autosaves. Checkpoints are activated only after defeating the boss at the end of each level	Med	Technical implementation for ensuring smooth checkpoints.	
F004b	Death system	Upon character death during combat, players lose all acquired buffs and items.	Med		

Feature F004: Boss Battle System

Design Brief:

The boss battle system includes dynamically adaptive bosses. The boss will use AI to analyze the current player's abilities, equipment, and skills, and adjust its attack sequence and combat behavior patterns to provide players with a unique and challenging experience. This system focuses on making boss battles a dynamic test of player skills, while ensuring that players will not kill the boss instantly due to the accumulation of late-stage values, making the game too simple. It also ensures that every time a player fights a boss, there is a sense of freshness.

Design Specification:

Dynamic Boss AI:

- **Player Analysis:**
  - Bosses evaluate the player’s equipped active/passive skills, weapons, and buffs upon entering the boss room.
- **Adaptive Strategies:**
  - The boss counters the player’s strengths based on their loadout:
    - Example:
      - If the player uses ranged weapons, the boss deploys long-range denial zones.
      - If the player relies on defensive skills, the boss prioritizes shield-breaking or AoE attacks.

- **Phased Combat:**
    - Boss fights are divided into multiple phases, each with unique abilities:
        - Phase 1: Standard attacks to test the player's approach.
        - Phase 2: Counters based on player reliance on specific skills or patterns.
        - Phase 3: High-difficulty mechanics, such as an enrage state or ultimate moves.

Transition to Next Map:

- After leaving the rest room, players transition to a new map with distinct challenges and objectives.
- Each map introduces new enemy types, environmental hazards, or puzzles that require strategic planning.

Feature F004a: Checkpoint System

Design Brief:

The Checkpoint system is activated when the player enters the Lounge after defeating a boss. The system automatically saves the player's progress and prepares them for the next map. Checkpoints ensure a smooth transition between levels and provide a reliable save point to prevent players from losing progress after a boss fight. In the Lounge, players can recover health, restock consumables, and prepare for the next level.

Design Specification:

1. **Checkpoint Activation:**
    - The checkpoint is automatically triggered when the player steps into the restroom.
    - Upon activation, the game autosaves:
        - Current health.
        - Inventory.
        - Progress.
    - A visual/audio notification confirms the save.
2. **Rest Room Integration:**
    - Checkpoints are only accessible in rest rooms, which are unlocked after defeating a boss.
    - Rest rooms function as a combination of checkpoint and preparation zones:
        - Heal to full health.
        - Swap or adjust loadouts.
3. **Save and Load Functionality:**
    - **Autosave:**
        - Activates when entering the restroom.
        - Saves automatically without requiring manual input.
    - **Load System:**

        - Upon exit the game, the player respawns in the most recent rest room with all progress intact.
4. **Visual and Audio Feedback:**
    - **Visual:**
        - A glowing save icon or animation activates when the checkpoint is triggered.
    - **Audio:**
        - A short chime or tone plays to confirm the save.
5. **Checkpoint Consistency:**
    - Checkpoints must ensure:
        - The boss remains defeated.
        - All collected loot is retained.
        - All unlocked progress in the map is preserved.

Feature F004b: Death System

Design Brief:

The introduction of the Death System shows the consequences of a character's death in combat. Upon death, the player loses all acquired buffs and temporary items, adding to the challenge and strategy. The player respawns at the starting point of the entire game, retaining only permanent progress, such as unlocked skills, memory fragments, and background stories. The Death System emphasizes the importance of survival and decision-making by imposing a penalty on the player's death. The system encourages careful resource management and planning.

Design Specification:
Death Penalties:

- **Temporary Buff Loss:**
    - All active buffs are removed upon death.
- **Item Loss:**
    - Non-permanent consumables or dropped items collected are lost.
- **Progress Reset:**
    - All progress within the current map resets to its state at the start.

Retained Progress:

- **Permanent Progress:**
    - Players retain:
        - Memory shards.
        - Unlocked skills and weapons.

    - Story-related achievements.

Respawn Mechanism:

- Players respawn at the start of all maps.
- The boss's health resets to full if the player dies during a boss battle.

Visual and Audio Feedback:

- **Death Animation:**
    - A unique character death animation plays.
- **Game Over Screen:**
    - A screen displays the message “You Died” or similar, with options to respawn or return to the main menu.
- **Respawn Notification:**
    - Upon respawning, a notification confirms, “Respawned at The Start.”

F005	Hidden System	To hide some common sense part that would appear in the normal game	High		
F005a	Health System	Hidden health bars, dynamic responses based on health.	Med	Hidden information may frustrate players if not balanced well.	
F005b	UI System	Minimal UI to reflect hidden health, inventory, and status. Subtle indicators for key in-game states.	Med		
F005c	Audio System	Use of ambient sound and music to build tension.	Low		
F005d	AI System	Enemy behaviors react dynamically to proximity and health status.	Med	Complex AI reactions might affect performance.	
F005e	NPC System	NPC will only show in key part, will avoid too much NPC to destroy the tension.	Low		

Sub-Feature F005a: Health System

Design Brief:

The health system hides the player and enemy health bars in the UI. Health is communicated through visual and audio cues, encouraging players to rely on observation and situational awareness. The system provides a more immersive and challenging experience, similar to Monster Hunter or zombie survival games. Players must monitor subtle signs such as animations, visual changes, and sound effects to judge their own health and the status of their enemies. This is designed to increase immersion and challenge while rewarding players who pay attention to situational clues.

Design Specification:
Hidden Player Health:

- The player’s health bar is not displayed on the UI.
- **Indicators of Low Health:**
    - Screen effects:

        - Gradual red vignette intensifies as health decreases.
        - Blurring or fading effects for critical health.
    - Audio cues:
        - Heavy breathing or heartbeats as health becomes critical.
    - Animation changes:
        - Slower movement or staggered animations when critically injured.

Hidden Enemy Health:

- Enemies' health bars are hidden from the player.
- **Indicators of Enemy Health:**
    - Visual:
        - Wounds, blood splatters, or broken armor appear as damage accumulates.
        - Changes in posture or movement patterns.
    - Audio:
        - Groans, screams, or weakened roars for enemies.
        - Increased aggression or desperation in their attacks at low health.
    - Behavior:
        - Some enemies may flee, stagger, or enter an enraged state when critically wounded.

Death Feedback:

- **For Player:**
    - A fade-to-black effect with a sound cue indicates death.
- **For Enemies:**
    - Enemies collapse, explode, or dissolve based on their type, with matching sound effects.

Immersion-Focused Indicators:

- No explicit numbers or UI overlays display health.
- All feedback must come from in-game visuals, sounds, and animations.

Player Health States:

- Healthy: No visual/audio effects.
- Moderate Damage:
    - Red vignette at 50% health.
    - Heavy breathing audio cue starts at 40%.
- Critical Health:
    - Intense red vignette at <25%.
    - Heartbeat audio starts at 20%.
    - Blurred vision and staggered animations at <15%.

Enemy Health States:

- Healthy: Normal appearance and behavior.
- Moderate Damage:
    - Visible wounds and slight staggering at 50% health.
    - Increased frequency of audio cues.
- Critical Health:
    - Severe wounds and limping/staggering at <25%.
    - Enraged behavior at <20% .

Indicators Timing:

- **Visual Changes:** Gradual progression every 10% health drop.
- **Audio Cues:** Triggered at specific thresholds.

Sub-Feature F005b&c: UI System & Audio System

Design Brief:

The system combines a minimalist UI with an immersive audio system to create a pure, non-intrusive gaming environment. The UI is stripped down to display only key elements, such as active skills and weapon information, while the audio system uses dynamic soundscapes and environmental cues to convey key game information and enhance the player's immersion in the game world. The goal of the minimalist UI and immersive audio system is to reduce visual clutter and maximize environmental immersion. The UI only provides minimal information, such as equipped weapons and active skills, leaving players to rely on environmental cues and their own awareness to survive and progress. At the same time, the audio system plays a core role in conveying key game states, enhancing tension, and creating a dynamic immersive experience through ambient sounds and situational audio feedback.

Design Specification:

1. **Minimalist UI:**
    - **Core Display Elements:**
        - **Weapon Indicator:** Shows the currently equipped weapon.
        - **Active Skills:** Displays active skills with cooldown indicators when triggered.
    - **Hidden Elements:**
        - Health, stamina, and enemy health bars are hidden to encourage reliance on visual and audio cues.
    - **Dynamic UI:**
        - UI elements only appear contextually.
    - **Design Style:**

        - Minimalist and subtle, using small, unobtrusive icons and translucent overlays.
2. **Immersive Audio System:**
    - **Environmental Feedback:**
        - Ambient sounds dynamically shift based on the player's location and situation:
            - Examples:
                - Forest areas have rustling leaves and distant animal sounds.
                - Caverns echo with dripping water and distant growls.
        - Footstep sounds change based on surface type.
    - **Dynamic Tension Building:**
        - Audio changes based on player proximity to threats or important events:
            - Subtle music shifts or ambient distortions signal approaching danger.
            - Louder, more frantic sound cues emerge during combat or boss encounters.
    - **Narrative Enhancement:**
        - Use soundscapes to reflect the story's tone:
            - Example: A desolate battlefield has faint echoes of past battles, while a calm sanctuary features serene, melodic tones.
3. **Situational Cues through Sound:**
    - **Player Feedback:**
        - Damage taken triggers specific sounds.
        - Stamina depletion is indicated through heavier breathing.
    - **Enemy Behavior:**
        - Enemy sounds provide clues to their state:
            - Growls or footsteps indicate their proximity.
            - Roars or screeches signal aggression or readiness to attack.
    - **Combat Audio:**
        - Impact sounds differentiate light and heavy attacks.
        - Weapon-specific effects.
4. **Integration with Hidden UI:**
    - Audio compensates for the hidden UI elements:
        - Player health is indirectly communicated through audio cues like heavy breathing or heartbeats at low health.
        - Enemy health or state is conveyed through their groans, roars, or weakening sounds.

UI Visibility:

- Weapon icon size: ~40x40 pixels.
- Active skill icons: ~50x50 pixels with a translucent cooldown overlay.
- Display duration for UI elements: 3 seconds after activation, then fade out.

Audio Dynamics:

- Environmental sound intensity:
    - Calm areas: ~30% base volume.
    - Combat zones: ~70% base volume with layered effects.
- Health-based player audio:
    - Normal health: No breathing sounds.
    - Below 50% health: Faint breathing begins.
    - Below 25% health: Heavy breathing and heartbeat sounds.

Combat Sound Effects:

- Weapon-specific sounds:
    - Light attacks: ~0.5-second sound with moderate volume.
    - Heavy attacks: ~1-second sound with higher volume.
- Enemy roars:
    - Normal state: ~70% volume.
    - Enraged state: ~100% volume with added distortion.

Sub-Feature F005d&e: AI System & NPC System

Design Brief:

Integrated AI and NPC system extends advanced AI capabilities beyond boss battles, applying them to common enemies and limited NPC appearances. Enemy AI reacts dynamically to player distance, health, and movement, creating immersive and challenging encounters. NPCs are used sparingly, primarily appearing in the break room to provide key interactions without ruining the game's tension.

Design Specification:

1. **AI for Normal Enemies:**
    - **Behavioral Adaptation:**
        - Enemies dynamically adjust their actions based on:
            - **Proximity:** Enemies become more aggressive as the player approaches.
            - **Player Health:** Enemies exploit weaknesses, such as rushing or overwhelming a critically injured player.
            - **Combat Patterns:** Enemies adapt to repetitive player strategies.
    - **Attack Variety:**
        - Normal enemies have a range of light and heavy attacks or special abilities tied to their archetype.
    - **Group Tactics:**

        - Enemy groups cooperate, such as surrounding the player or staggering their attacks to maintain pressure.
2. **NPC System:**
    - **Limited Presence:**
        - NPCs are intentionally sparse in the game world to preserve tension and isolation.
        - NPCs primarily appear in rest rooms for:
            - Story progression.
            - Providing consumables or upgrades.
    - **Passive Behavior:**
        - NPCs do not actively interfere in combat or exploration, maintaining the focus on the player's experience.
    - **Visual and Narrative Integration:**
        - NPC designs reflect the game's theme, such as mysterious healers or blacksmiths, contributing to the world's atmosphere.
3. **AI Integration for NPCs:**
    - **Dialogue Interaction:**
        - NPCs react to the player's current state.
    - **Utility Functions:**
        - NPCs offer key services:
            - Healing.
            - Resource replenishment.
            - Skill or weapon management.
4. **Dynamic AI Optimization:**
    - AI behavior is optimized to balance complexity and performance:
        - Limit the number of active AI calculations to ensure smooth gameplay.
        - Prioritize nearby or engaged enemies for complex behaviors.

Enemy AI Parameters:

- **Proximity Reaction:**
    - Aggression Threshold: Within 10 meters.
    - Attack Readiness: 2 seconds after detection.
- **Health-Based Behavior:**
    - Player health <50%: Enemies use more aggressive attacks.
    - Player health <25%: Enemies attempt to overwhelm the player with group tactics.
- **Adaptation Timing:**
    - AI updates its behavior every 5 seconds during combat.

NPC Appearance:

- Restroom Frequency: One NPC per restroom.
- Hidden World NPCs: Maximum of 1-2 per map for optional lore or rewards.

Dynamic AI Optimization:

- Maximum Active Enemies with Full AI: 5.
- Simplified AI for Background Enemies: Enemies not directly engaged with the player have limited behaviors.