

**Cloud Imperium** System Design Test for Junior AI Designer  
Position by **Daniel Mercer** [danielmercer.wixsite.com/mysite](http://danielmercer.wixsite.com/mysite)

Email: [danielmercer99@hotmail.co.uk](mailto:danielmercer99@hotmail.co.uk)

## Contents

Task 1: Replace one of the existing systems in a game (e.g. Pac-man) with a completely different system. Describe that system and how/why it makes the game better.....	1
Solution: .....	1
Reasoning: .....	2
Task 2: Design an additional system that would make a multiplayer game (e.g. Quake) more tactical.....	4
Solution: .....	4
Reasoning: .....	6
Task 3: Consider Quake and Counterstrike. Pick your favourite of the two and explain what makes it a superior game from a systems perspective.....	7
Response:.....	7
Reasoning: .....	8
Task 4: Consider Minecraft and DayZ. Explain why in one game people kill, torture, grief, abuse each other while in the other everyone is working together and being very friendly to one another. What is the difference between the two games that generates this different behaviour?.....	9
Response:.....	9
TLDR:.....	11
Task 5: Name 5 ways of relaying important story elements to the player without interrupting his gameplay experience or taking control over his character. Explain the strengths and weaknesses of each of them.....	12
Response:.....	12
Task 6: Choose a mood or emotion. Name 5 ways to bring that mood/emotion to a character in game.....	14
Response:.....	14

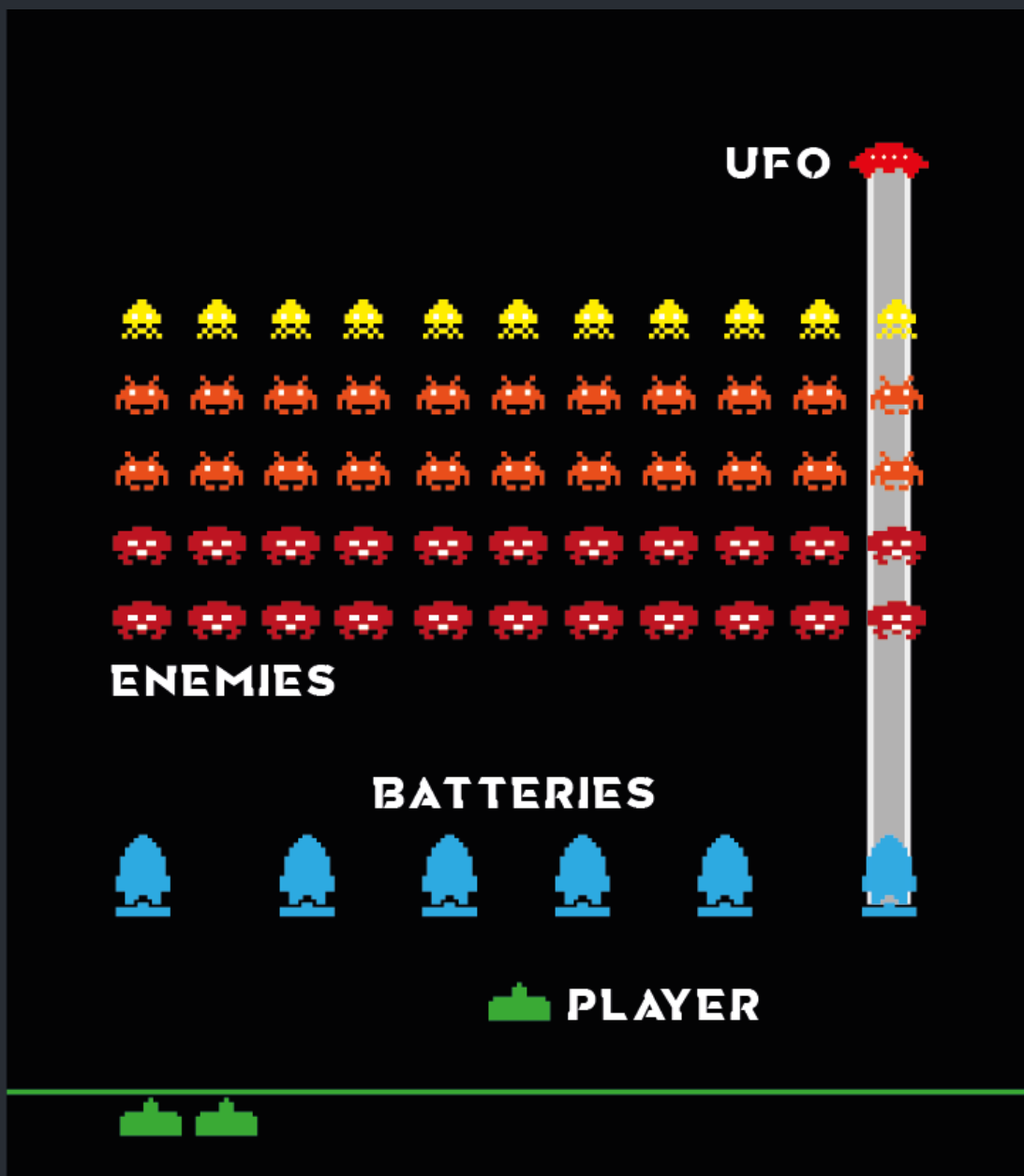
Task 1: Replace one of the existing systems in a game (e.g. Pac-man) with a completely different system. Describe that system and how/why it makes the game better.

Solution:

Game Chosen: **Space Invaders**

Removed System: **Bunkers & UFO bonus scoring system**

Created System: **Batteries & Bonus Scoring**










Bunkers have no real function in Space Invaders, but by giving them some purpose, the game can be made more exciting and dynamic!

The battery system completely changes the pacing of the game. It is made to provide players a reason to destroy enemies quickly & rewards them for doing so.



A battery is made from a shell & and a power core underneath, when the power core is hit, the battery is destroyed and disappears, no longer giving bonuses to the player as well as providing less cover for the player.

Just like Bunkers in Space Invaders, batteries can be damaged by both enemies & players, however because the Power Core is on the bottom of the battery, players are at risk of instantly destroying a battery.

-  **6 Batteries to start**
-  **Batteries provide bonuses to the player**
-  **All 6: +20% points from enemies killed**
-  **>4: Increased fire rate**
-  **>2: Increased movement speed**

Similar to bunkers, when enemies reach the level of the batteries, the shell is gradually destroyed as they pass through the battery, when an enemy makes physical contact with a power core, the battery is fully destroyed.

In addition to the batteries, the system also includes a revamped UFO. Traditionally the UFO flies over head, and when destroyed, provides the player with bonus points (extra points if the player hits it after shooting a specific amount of bullets).

In the new system, the UFO passes overhead and stays on screen, moving side to side for a few seconds before selecting a random battery and launching a laser attack that instantly destroys the battery it chooses. The UFO can be destroyed and if destroyed before it stops, the player is awarded more points than when it is stopped. More interaction, more varied gameplay, more incentives to play fast and strategically.

---

### Reasoning:

The bunkers in the original Space Invaders are designed to block shots from enemies, however experienced players commonly destroy these bunkers to provide better shots at enemies & the UFO, which provides more points. This makes bunkers in the original game mostly useless.

It is also a common tactic to let enemies come as close to the bottom of the screen as possible to make it easier to hit shots on them.

The original game creates difficulty by having enemies move more quickly the less enemies there are. The battery system creates difficulty by making the player weaker instead of having the enemies get stronger as the game gets considerably harder the longer the game goes on, which is an improvement on the original game.

As well as the bunkers, having the UFO as a flat bonus seems out of place (it is an "enemy" and it makes sense for it to attack and have some functionality). There is little risk in the



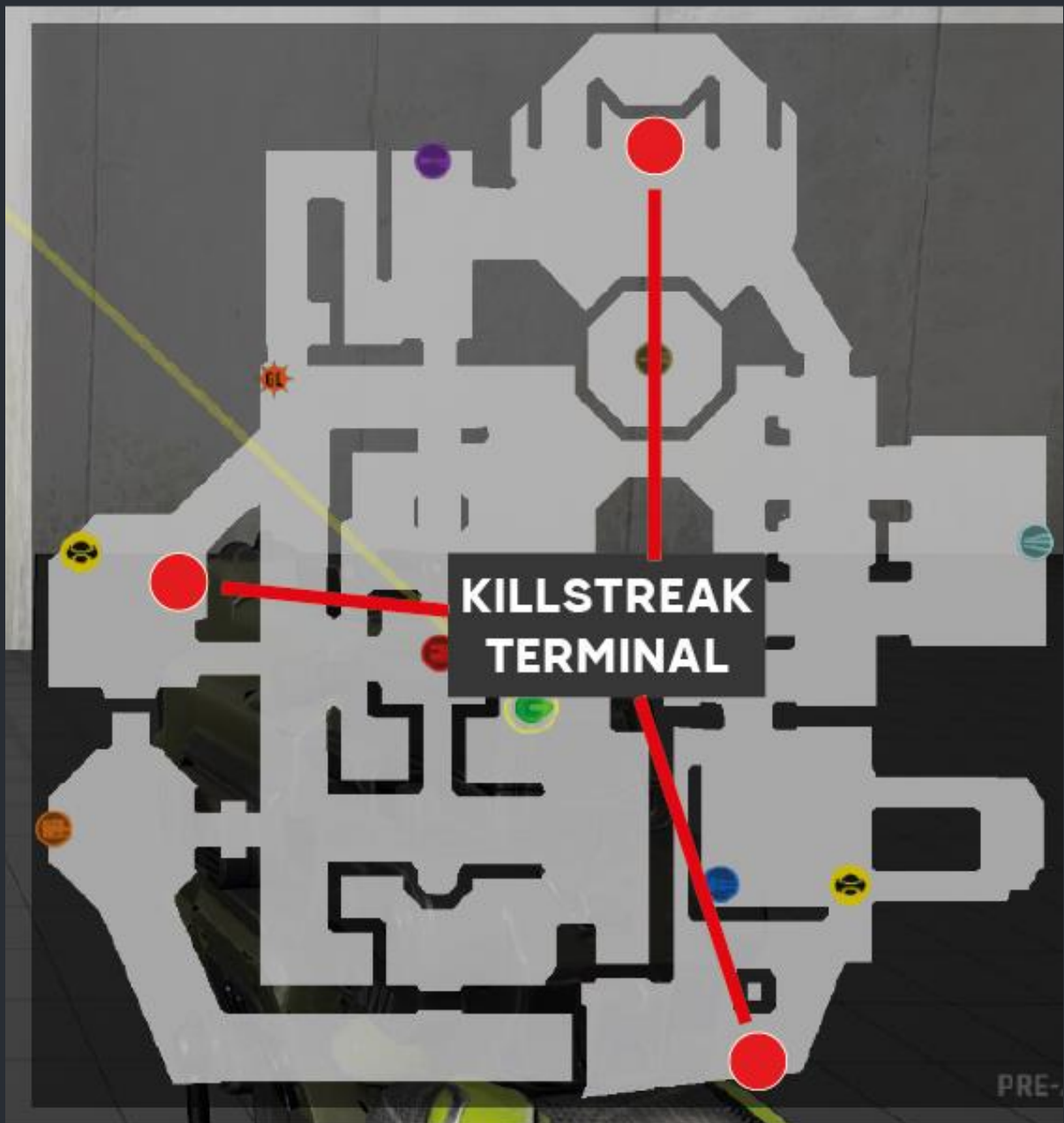
Task 2: Design an additional system that would make a multiplayer game (e.g. Quake) more tactical.

Solution:

Game Chosen: **Doom (2016)**

Designed System: **Killstreaks!**

The killstreaks system aims to build on the foundations of Doom's Run & Gun gameplay. Killstreaks differ from standard "abilities" as every player has access to the same killstreaks & the streaks tokens can be lost upon death.



**The System:**

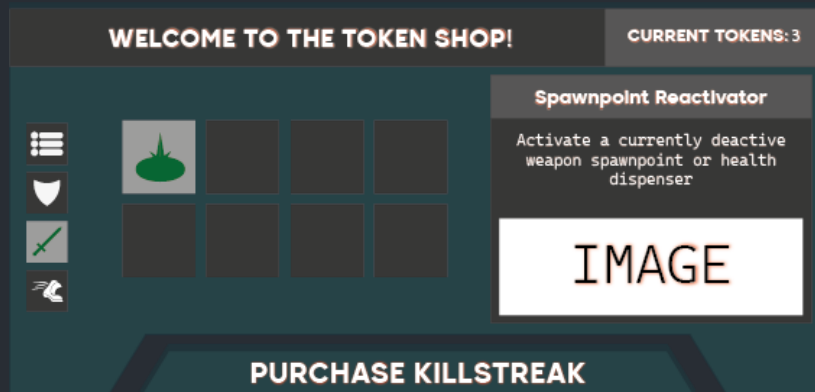
Upon **killing an enemy**, the player **receives a token**; when collecting enough tokens from killing consecutive enemies without dying, the player must then **travel to a "killstreak terminal"** to cash-in their tokens to **receive a single use item**.

The initial token collection makes the player **more careful** in order to not lose their tokens, the terminals are a secondary objective created to provide a **risk/reward scenario** to the player to make them **think tactically** about what their next move will be.

Killstreak rewards will consist of useful boosts to player's stats or single use abilities (i.e. over shields, stun grenades, short invisibility, AI companions, demon killer).

The more tokens a player has the better the killstreak they can buy.

The main problem with this system is the time it would take to buy items, meaning the player will be vulnerable to attack whilst in the shop. This is the main reason for multiple shops. The system also includes a pre-game quick-buy menu that the player can set up so they can interact with the shop more quickly.



Kill (Get Token) >	> Activate Token > Shop	> Purchase > Killstreak	> Use Killstreak
+1 token per kill If the player dies, all their tokens are lost	To speed up purchasing items, the shop only shows items that the player can afford. Players can create a "killstreak quick buy menu" outside of the game for quicker interactions  Killstreak have different costs (more powerful = more expensive)	Required token are spent & purchase is instantly transferred to player when bought  Purchased killstreaks can NOT be sold and are NOT lost on death  If player holding >1 killstreak the newest items must be used first in order of newest >> oldest, Can NOT scroll through purchased killstreak.  Cooldown to avoid excessive buying from the same shop, CAN use a different shop if not on cooldown	Killstreaks destroyed when used  No cooldown between killstreak uses, only on purchasing from same shop

---

## Reasoning:

Common features / aspects in existing “tactical multiplayer shooters” (Counterstrike: GO, Valorant, Rainbow Six Siege, PUBG, Escape from Tarkov):

- **Death is final!** – Other than some single use “resurrection” abilities death is essentially permanent in all “tactical shooters”, this forces players to take precaution when approaching a situation and encourages safer playstyles as it is less likely to be killed when not taking risks.
- **Slower movement!** – Tactical games generally use slower movement with hardly any notable movement mechanics or level mechanics (i.e. dashing any direction, Strafing whilst airborne, jump pads). Less overall movement in the game encourage the players to think more about their decisions as they are less likely to escape by running away.
- **Slow Healing!** – This feature is mainly seen in PUBG & escape from Tarkov & other battle royale-esque titles. When healing the player must either wait through a relatively lengthy animation (i.e. wrapping bandage, drinking / eating) or the healing item gives health over time.

To make a game more tactical, the game must be **slowed down** and the player must be directed to a **slower & more self-preservationist playstyle** rather than the usual run & gun experience that *Doom* players are used to. The idea is to **promote tactical decision making**, the slower gameplay aims to give the player **more time to think of solutions to their current problems**.

**The designed system must add to the game**, it should not aim to change the “identity” of the overall product. Therefore quick movement & the run & gun feel must be maintained as to **not change the fundamental design of the game**.

**Doom features that CAN'T be changed:** NO CLASSES, NO ADDITIONAL ABILITIES (OTHER THAN “EQUIPMENT”), NO PERMA DEATH, NO SLOWING MOVEMENT SPEED, NO REDUCING HEALTH, EVERY PLAYER MUST HAVE EQUAL EQUIPMENT & EQUAL OPPORTUNITY.

*A consideration for the killstreak system would be how impactful the killstreaks would be in regards to score difference between teams/players. Time limits & score limits would have to be altered to accommodate the change in playstyles. Either killstreaks have high impact causing matches to end much quicker due to leading teams “snowballing” or they have low impact and the slower playstyles decrease engagements between players.*

**Task 3: Consider Quake and Counterstrike. Pick your favourite of the two and explain what makes it a superior game from a systems perspective.**

Response:

Chosen Games: **Quake Champions (2017) [vs] CS: GO (2012)**

QUAKE SYSTEMS	COUNTERSTRIKE SYSTEMS
<b>Movement:</b> Fast-paced, small jump commonly used when running to move quicker, jump pads for verticality, portals for moving across the map, constantly moving.	<b>Movement:</b> Slow-paced, small jump to reach ledges/crates, commonly used whilst running for quicker movement.
<b>Equipment:</b> Weapons spawn around the map, players have character abilities with cooldowns.	<b>Equipment:</b> Weapons & items bought at the start of the round, no special abilities.
<b>Health/Defence:</b> Respawn after death, high health pool, enemies drop instant-use health packs on death, health packs spawn around map, armour spawns around the map.	<b>Health/Defence:</b> Permanent death, low health pool, can buy armour at the start of the round, no healing.
<b>Objective:</b> Most played mode is TDM/FFA, most kills = win. <b>Symmetrical goals.</b>	<b>Objective:</b> Most common mode is competitive ("plant the bomb" / "hostage rescue") mode, two ways of winning – kill whole enemy team or plant/defuse bomb / Rescue the hostage. <b>Asymmetrical goals.</b>
<b>Accuracy:</b> No recoil, some weapons have splash damage making damaging enemies easier.	<b>Accuracy:</b> Have to control recoil and steady scopes making aiming harder especially when moving.
<b>Weapon Variety:</b> Features various weapon types (beam weapons, explosive launchers, projectiles etc.).	<b>Weapon Variety:</b> Features projectile weapons and grenades.
<b>Evolving Gameplay:</b> Run out of ammo forcing the player to use another weapon they have.	<b>Evolving Gameplay:</b> Objectives are activated, forcing players to react, changes the games pace. Weapons can run out of ammo & can be thrown. Weapons can be changed by picking up a weapon from a killed teammate or enemy.

Superior Systems: **Counter Strike: Global Offensive**



---

## Reasoning:

Both games are fundamentally “fair” with each providing player’s equal opportunity during play. Although I enjoy the faster playstyle of Quake, counterstrike from systems perspective is slightly better due to the way the **systems serve the flow of the game at each step during the game.**

I prefer to think the quality of a system is shown by its **versatility & its impact on the state of the game.** Quakes balancing is based around symmetrical goals, everyone must have equal chances. Counterstrike uses asymmetrical goals and must provide balancing in other areas.

Counterstrike’s game state is constantly evolving throughout the match, not only do players have to manage their money to buy weapons, but different weapons reward different amounts. From person to person, gameplay can vary wildly depending on their playstyle. On death enemies drop their weapons, which can then be picked up by anyone still alive. Planting the bomb also adds tension & urgency to a match causing remaining players to move quickly to achieve victory, this pacing is balanced out with their health system as health does not regenerate and players are forced to act cautiously if lower on health.

Compare this to Quake’s constant run & gun style where you will typically find every player using a similar playstyle. A typical Quake match stays at the same pace throughout the match, ending when somebody hits the point limit or time runs out. Opportunistic play is rewarded in Quake as they may be first to a weapon spawn or may be first to jump pad to surprise an enemy etc.

Counterstrike has players decide on weaponry before the round starts & makes them have to deal with problems with choices they have made previously, the systems allow constant learning & improvement from a players perspective.

**The systems in Quake are there to facilitate a much more focused playstyle than counterstrike is.** The more versatile and varied playstyles that Counterstrike allows is why I think their systems are better.

Task 4: Consider Minecraft and DayZ. Explain why in one game people kill, torture, grief, abuse each other while in the other everyone is working together and being very friendly to one another. What is the difference between the two games that generates this different behaviour?

Response:

*Although Minecraft is mainly played by people in their private worlds, for the purposes of this argument, both games will be considered relating to a populated server with random people.*

Minecraft focuses on retaining players for multiple sessions in which they tend to build towards a singular overarching goal each time they play. DayZ is designed to give a player shorter sessions of enjoyment, where they can jump into a lobby, kill players, get good loot and log off satisfied.

Griefing can happen in both games however Minecraft has a much easier time promoting cooperative play over DayZ for many reasons:

- **Resource gathering - Endless vs Limited Resources**
  - Acquisition
    - In Minecraft, resources are abundant and can be easily found by an experienced player, there is little need for combat against other players unless players want to test their fighting skills against one another.
    - In DayZ, in order to obtain loot camping outside of a dangerous yet resource-full are and killing unaware players is easier than attacking a base full of enemy AI.
- **Management & loss – Small Set-back vs Game Ending**
  - Attributes & character health
    - In Minecraft, the player must look after their health & hunger. A player combats this by killing animals to get meat or by creating a farm to grow food. Hunger isn't a major concern to an experienced player as they can collect enough food to feed a lot of people consistently relatively quickly.
    - In DayZ, players must manage not only their health & hunger, but they must keep their temperature in check and collect water as well. Combined with the fact that resources are limited, players sometimes prefer to kill other players in hopes they have resources to deal with their illnesses or hunger etc.
  - Regaining lost items or retaining the lead
    - In Minecraft, when the player dies (unless they have the option turned off) they drop their items and they have a small amount of time to go back and collect them. The player can also craft a bed to respawn in upon death, making dying not as much of a problem.

Even if the player is not able to collect their items they were carrying, the availability of resources available in a Minecraft world is so large that they **do not take much time to replace**.

- In DayZ, when a player is killed they will be looted and their loot will be stolen, there are no beds to spawn closer to a fight. **When you die, you start from scratch and replacing lost items is hard as there is no guarantee a player will find the same items in the same places.**
- **Progress & endgame – Common Goals vs Personal Goals**
  - The main threat
    - In Minecraft, **the main threat/enemies are AI enemies**, whether that be basic mobs, stronghold guardians or bosses.
    - In DayZ, other than strongholds defended by AI soldiers and a small amount of zombies, the AI doesn't pose much of a threat to an experienced player and because the **main loot a player finds lying about is weaponry**, the only **logical target for people looking to test their combat skills is other players**. Add this to the possibility of finding better loot on slain enemies, **killing and grieving is potentially very profitable**.
  - Endgame bosses & endgame loot
    - In Minecraft, **player's progression is not commonly tied to killing other players**. Players generally have goals relating to building a large base, killing bosses and exploring strongholds all of which can be achieved through PvE means, there is not benefit to killing other players & may cause unnecessary conflict that could descend into players destroying each other's bases.
    - In DayZ, **there is no definitive endgame**. Even though there is base building in DayZ, this feature is not the main focus for most players, they just use their bases as a place to store loot. Most players would agree that the **endgame for them would be obtaining the best loot that they can & then engaging other players in PvP**. Once a player reaches a certain level of equipment, they will be **concerned with keeping it safe and this mind-set further feeds into the PvP aspect as they will more likely to "Kill on Site" to avoid risking their amassed wealth**.
- **Environment & setting – Medieval fiction vs Apocalyptic realism**
  - Surroundings
    - In Minecraft, a player is dropped into a **cartoony, colourful world** with very little guidance on what to do other than explore the world, where they may discover peaceful villages, or dangerous mobs that they can't attack due to **having no weaponry**, this prompts the players to **start gathering resources to start building & they are introduced to mining and crafting rather than crafting weapons to slay enemies**.
    - In DayZ, players are dropped into an **apocalyptic deserted world**. After looking around players **are likely to find weapons**, there is very **little indication shown about other playstyles other than violence**. During their exploration, the players may find their resources are dropping (food, water etc.) and they haven't found many items to help, as looting is the only way to combat these problems, **players are compelled to take things from other players**.

---

### TLDR:

Minecraft makes it easier to recover from losing gear due to its wide availability of resources & how easy it is to gain endgame items. Whereas dying in DayZ can be devastating as the lack of available resources & spawns ensures killing players is the easiest way to regain lost loot.

The inclusion of dangerous AI enemies & bosses in Minecraft ensures there is enough excitement when fighting AI so players don't feel a need to attack each other, also Minecraft has very little weaponry (swords, bows and crossbows) the limited weapon pool communicates to the player that combat is not necessary for the experience. Whereas DayZ includes multiple weapons and weapon types and the main threats you will come across is other players as there is little to do in terms of "endgame content", players are forced to create their own experience and with the large availability of weaponry found when looting, combat is a clear choice for most.

These circumstances naturally cause rifts amongst players and some players enjoy the feeling of destroying other player's sessions, which DayZ facilitates much more than Minecraft does.

Task 5: Name 5 ways of relaying important story elements to the player without interrupting his gameplay experience or taking control over his character. Explain the strengths and weaknesses of each of them.

Response:

1. Environment

a. Strengths

Environmental storytelling is a key feature in most games and if done correctly can provide a player with information about what happening around them, both physically and in the story.

Environmental storytelling also has the benefit of fitting into a game world easily, a well-made environment provides information to the player in a way that furthers immersion, but does not distract the player.

b. Weaknesses

For all the benefits environmental storytelling has, smaller details can be missed by a player that runs through the game quickly, for an environment to work at communicating story elements, the players has to care about the story so that they take the time to look around.

From a developer's perspective, environments that are highly detailed and are key for communicating information, may take a longer time to be developed and if the player does end up missing these features, the development time may seem wasted.

2. Sounds / Music / Dialogue

a. Strengths

Sound effects can be used many times without them being repetitive, employing sound is also a great way to get attention and an instant emotion from the player, especially if a song is played consistently at certain points in the story (e.g. a sad song only plays during sad moments). Sound effects also have the benefit of being easily customised for any situation and are not too difficult to implement.

b. Weaknesses

The problems with using sound is when the sound does not fit the overall experience, bad sound can be detected much more easily than a bad visual can. Also when multiple sounds are playing at once, a bad sound design sticks out like a sore thumb and can ruin player's immersion.

3. Weapons / Abilities

a. Strengths

Abilities are the main tool a player uses throughout a game, therefore a change to a players abilities (either they lose a weapon in a fight or

they gain a new power from a power up) is always sure to get the players attention and communicate to them that a key story element is being played out. It is much easier to focus a player on a story element if it tied to the gameplay.

**b. Weaknesses**

However, not all games have weapons and abilities that they can just take or give to the player, a walking sim for example cannot take away players abilities as their probably isn't any to begin with. A large problem also arises when you take into account the players reaction to such events. Some players may feel angered by losing a weapon / power and may have their playing experience ruined.

4. Interactions / Triggers

**a. Strengths**

Interactions & triggers can be great for focused parts of a game, they can often be used to replace the need for weapons & abilities instead providing the player with other key ways of interacting with the environment albeit in a more literal way, interactions like picking up notes can be used throughout a game and like dialogue brings the players focus to specific point.

**b. Weaknesses**

Interactions are heavily situational, all different interactions need their different circumstances and unique interaction. A generic press button interaction will not be as powerful as a gameplay segment where they sneak into a castle. Interactions with environmental items also run the risk of slowing down the pacing of the game, so that the player may lose interest.

5. Objectives / Loot

**a. Strengths**

Objectives can change the pacing of a game for the better, so the player is kept engaged. An objective to gather some loot to proceed through the next stage can be exciting and can provide the player with context to what is happening within the story.

**b. Weaknesses**

Objectives & side quests that may influence the main story may contain too much uninteresting content for a player to be satisfied with. The game risks boring the player if too many objectives are too similar. They also run the risk of being too distracting to the player.

## Task 6: Choose a mood or emotion. Name 5 ways to bring that mood/emotion to a character in game.

Response:

Chosen emotion: **Prideful-ness / Over-Confidence**

Video game characters that show "pride" (even if it is too much!):

- Duke Nukem
- Sett (LoL)
- Deadpool
- Dio (JJBA)

How to bring pride to a character:

### 1. Aesthetics (clothing / armour / colour palette)

An overly confident character will typically dress in **bright / vibrant clothing**, they **want to be noticed**. *Dio from Jojo's Bizarre Adventure* is an excellent example of this, **his bright yellow clothes echo his confidence in himself and his power**.

### 2. Speech / lack of speech

*Duke Nukem* is infamous for his over-the-top arrogant action-hero voice lines. **"It's time to kick ass and chew bubble gum...and I'm all outta gum"** being one of his most popular. His speech shows how confident he is in himself. A prideful character would have a couple lines of dialogue exclaiming how amazing they are.

### 3. Abilities / weapon choice

Prideful characters are **typically very sure of their ability with their (chosen/given) weapon / powers**. *Sett from League of Legends* uses bare fists and is known (from lore) **to get into fights**, even when he is as powerful as he is, he chooses not to hold a weapon, instead preferring to stick with his bare-knuckle style. By having characters reject more advanced weaponry in favour of more stylish ways of combat, they usually are very cocky or are very stupid.

### 4. Stance / animations

As well as his weapons, *Sett from League of Legends* has a **very confident stance & set of animations**. His stance has his **chest puffed out and he constantly rubs his fist**, indicating he is always ready for a fight. Confident stances where they are clear they are not hiding is a clear indicator of someone with too much confidence.

### 5. Company / lore / other characters views

Arrogant, overconfident people are **not generally the most well-liked people** in any universe. Characters that have a prideful streak normally are **surrounded with like-minded individuals or have no-one around them to annoy**. A character could be easily represented as being prideful by having **no friends & being disliked by a lot of people**.