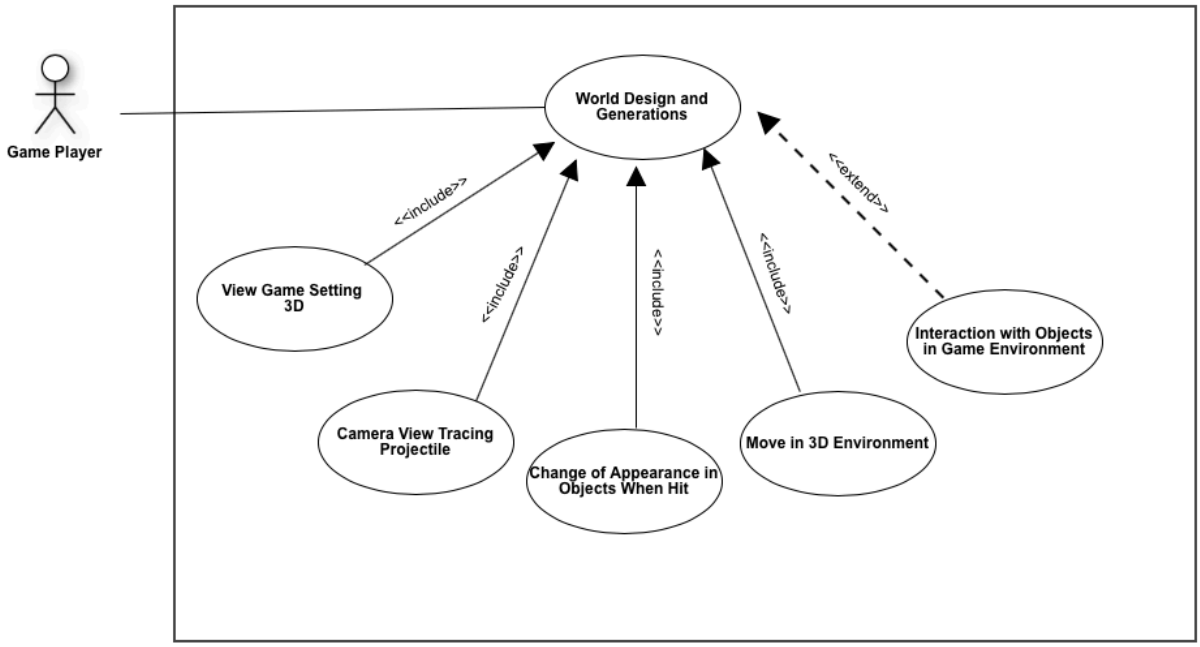
Name___Yingruo Liu_____ Mark _____/50

1. Brief introduction __/3

The feature I will be doing is World Design and Generations. For this task, I will design and implement the physical background and scene of the game, Trajectory, in Unity.

2. Use case diagram with scenario __14

Use Case Diagrams



Scenarios

Name: View Game Setting 3D

Summary: The player could view the game setting in a three-dimensional manner, where the player could see the environment around themselves.

Actors: Game player

Preconditions: The game has been launched.

Basic sequence:

Step 1: Player enters a key on the keyboard. ‘w’ for looking up, ‘a’ for looking left, ‘s’ for looking down and ‘d’ for looking right.

Exceptions:

Step 1: Player hits keys that aren't commands of 'w' or 'a' or 's' or 'd': ignore input.

Post conditions: Screen displays the surrounding scene in accordance to player's control
Priority: 1*
ID: C01
*The priorities are 1 = must have, 2 = essential, 3 = nice to have.

Name: Camera View Tracing Projectile
Summary: A camera view of the game surrounding following a projectile sent by the player.
Actors: Player
Preconditions: One projectile has been sent.
Basic sequence:

Step 1: Player shoots the projectile to a target.

Exceptions:

Step 1: Player hasn't launched a projectile: nothing displayed on the camera

Post conditions: The camera view tracing the projectile is displayed.
Priority: 2*
ID: C02
*The priorities are 1 = must have, 2 = essential, 3 = nice to have.

Name: Change in Appearance in Objects When Hit
Summary: When the player has hit any objects other than the sea (weapons will be placed in an absolute safe box resistant to attacks), there will be a physical change on the object in accordance to the damage.
Actors: Player
Preconditions: Player has caused damage to the objects in the game environment
Basic sequence:

Step 1: Player shoots a projectile

Step 2: Player has caused damage to objects in the game environment

Exceptions:

Step 1: Player doesn't hit any objects in the scene: nothing changes

Step 2: A button other than [calculate] or a number input is pressed: ignore input.

Post conditions: A change of physical appearance of objects in the game scene.
Priority: 3*
ID: C03
*The priorities are 1 = must have, 2 = essential, 3 = nice to have.

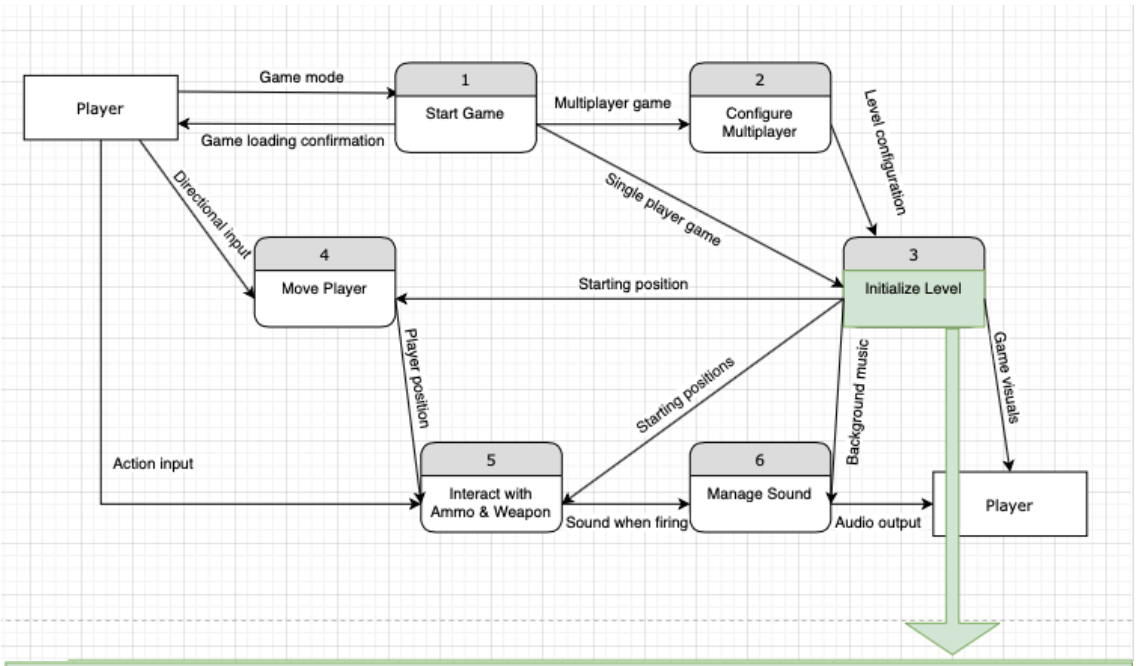
Name: Move in 3D Environment
Summary: The player uses keyboard to change the position of theirs. Press key 'i' for moving forward, 'k' for moving backwards, 'j' for moving left and 'l' for moving right.

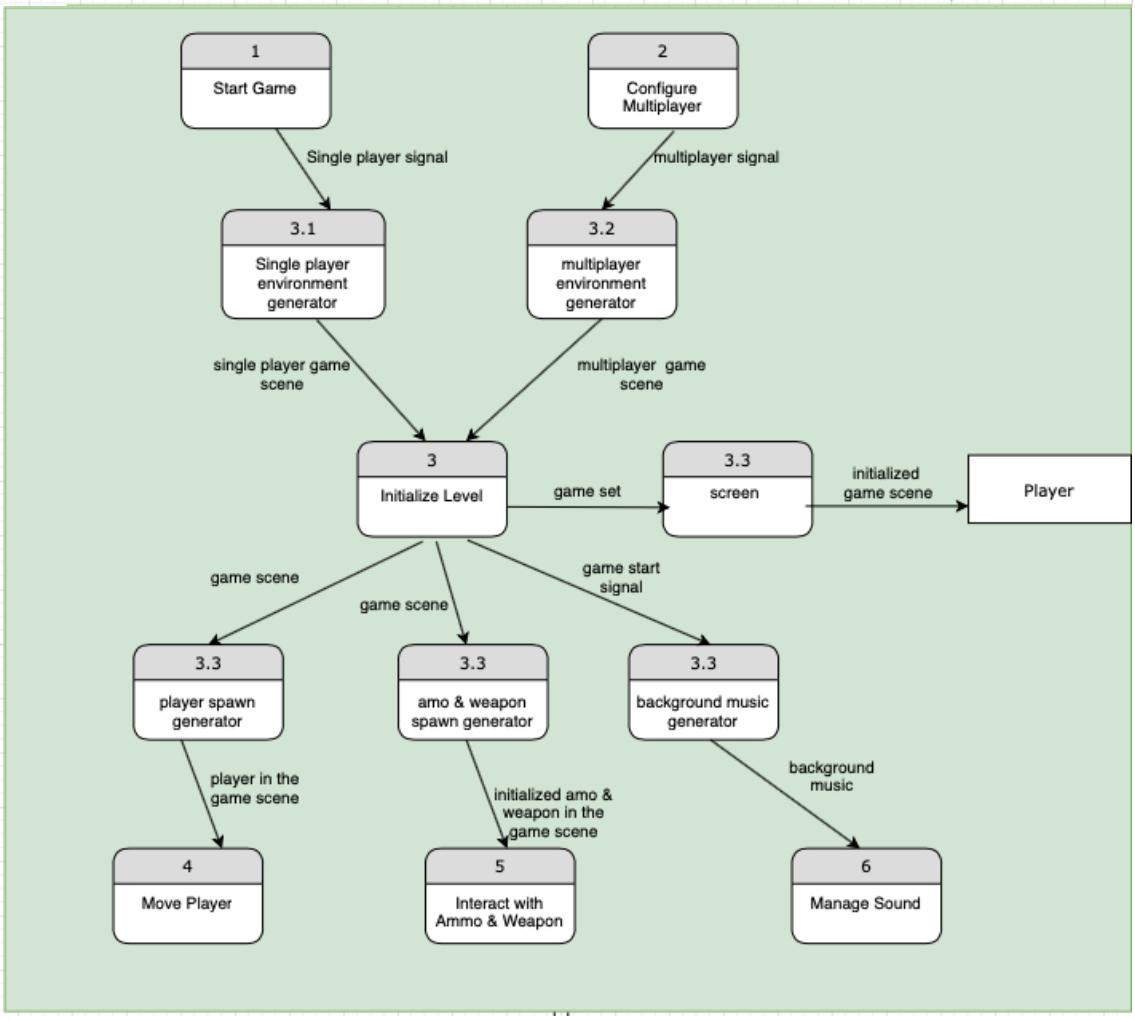
Actors: Player.
Preconditions: The game has started.
Basic sequence:
Step 1: Player entered a key of ‘i’ or ‘j’ or ‘k’ or ‘l’.
Exceptions:
Step 1: Player entered a key not of ‘i’ or ‘j’ or ‘k’ or ‘l’: no movements made.
Step 2: Player reaches a bar, or an object or the edge on the boat: no further movements made in that particular direction.
Post conditions: A movement in one direction of the player is made.
Priority: 2*
ID: C04
*The priorities are 1 = must have, 2 = essential, 3 = nice to have.

Name: Interactions with Objects in Game Environment
Summary: The player has interacted with objects in the game environment within the realm of allowance (i.e. amo & weapons). Player needs to move amo & weapons and load them before they could use them to launch attacks.
Actors: Player
Preconditions: Player has moved an object on the boat in the game scene.
Basic sequence:
Step 1: Player goes to amo & weapons
Step 2: Player picks up amo or weapons
Step 3: Player goes to firing place
Step 4: Player loads amo or weapon
Exceptions:
Step 1: Player tries to pick up things not designed for the player to interact with: ignore, no change made on the game set
Step 2: Player tries to put amo or weapon on places other than the firing place: ignore, no action taken but a change of scene on the amo & weapons storage
Post conditions: A change of amo & weapons on the scene and screen will be made according to the player’s action.
Priority: 3*
ID: C05
*The priorities are 1 = must have, 2 = essential, 3 = nice to have.

3. Data Flow diagram(s) from Level 0 to process description for your feature _____14

Data Flow Diagrams


Player
Game mode
Game loading confirmation
1
Start Game
Multiplayer game
2
Configure Multiplayer
Level configuration
Directional input
Single player game
4
Move Player
Starting position
3
Initialize Level
Player position
Starting positions
Background music
Game visuals
Action input
5
Interact with Ammo & Weapon
6
Manage Sound
Sound when firing
Audio output
Player


1
Start Game
2
Configure Multiplayer
Single player signal
multiplayer signal
3.1
Single player environment generator
3.2
multiplayer environment generator
single player game scene
multiplayer game scene
3
Initialize Level
game set
3.3
screen
initialized game scene
Player
game scene
game scene
game start signal
3.3
player spawn generator
3.3
amo & weapon spawn generator
3.3
background music generator
player in the game scene
initialized amo & weapon in the game scene
background music
4
Move Player
5
Interact with Ammo & Weapon
6
Manage Sound

Process Descriptions

Single Player Environment:

Single Player Environment will set one player up in the game setting while setting the opponent of the player to be controlled by AI. The game environment will be set on the sea with islands and a boat with weapons for one player to use.

Multiplayer Environment:

Multiplayer Environment will set both of the players to be opponents of each other. The game environment will be set on the sea with islands and a boat with weapons for one player to use.

Screen:

This process will render the environment generated by the commands of the user and the algorithm of our game into 3-D and real-time and present it to the user.

Single Player Spawn Generator

This process will generate a spawn base for the player using randomizing algorithm. The coordinates of the player, x and y, will be generated using rand()%range.

Multiplayer Spawn Generator

This process will generate the spawn bases for both players using a randomizing algorithm. The coordinates of the player, x and y, will be generated using rand()%range. However, both players will be kept some distance away. While(abs(x1-x2) < distance or abs(y1-y2) < distance){

Keep generating x and y for both players

}

Background Music Generator

Once the player hits start game, the background music will begin

If user hits start game,

Game_Start = True

If (Game_Start == True)

Music begins

4. Acceptance Tests _____9

Single Player Spawning

Choose single player mode and start the game for 100 times.

The outputs of the system should:

- generate different x, y coordinates of the player of each test
- Successful load of the same game environment setting of each test
- Player's boat and the other programmed boat should be at least some distance apart

• Player's boat should not be generated on an island

Multiplayer Spawning

Choose single player mode and start the game for 100 times.

The outputs of the system should:

• generate different x, y coordinates of both players of each test

• Successful load of the same game environment setting of each test

• Player one's boat and player two's boat should be at least some distance apart

• Player's boat should not be generated on an island

Change of Objects When Hit

Play as a user, launch 100 attacks that hit into the sea, on random objects (such as the islands and the boat) and the absolute safe room the player is in with the weapons).

• When the projectile hits into the sea, all the results should be that nothing in the game environment has changed
• When the projectile hits random objects such as the islands and boat, there will be a consistent physical damage made.
• When the projectile hits the room with weapons and the user, no damage will be made.

Interactions with Objects

Play as a user, try to pick up objects including weapons, random decoration objects and air 100 times.

• When weapons were picked up, player view of the environment and the User Interface info should change according to action taken.

• When random objects other than weapons were being picked up, no change will be made in the environment setting.

• When the player tries to pick up the air (the distance is greater than some set distance), no change in the environment will be made.

View Game in 3D and Movement

Play as a user, enter 200 keys randomly from 'w' 'a' 's' 'd' 'i' 'j' 'k' 'l'.

The immediate response from every key pressed from the player view should correspond with:

- ‘i’ for moving forward,
- ‘k’ for moving backwards
- ‘j’ for moving left
- ‘l’ for moving right.
- ‘w’ for looking up
- ‘a’ for looking left
- ‘s’ for looking down
- ‘d’ for looking right.

5. Timeline _____/10

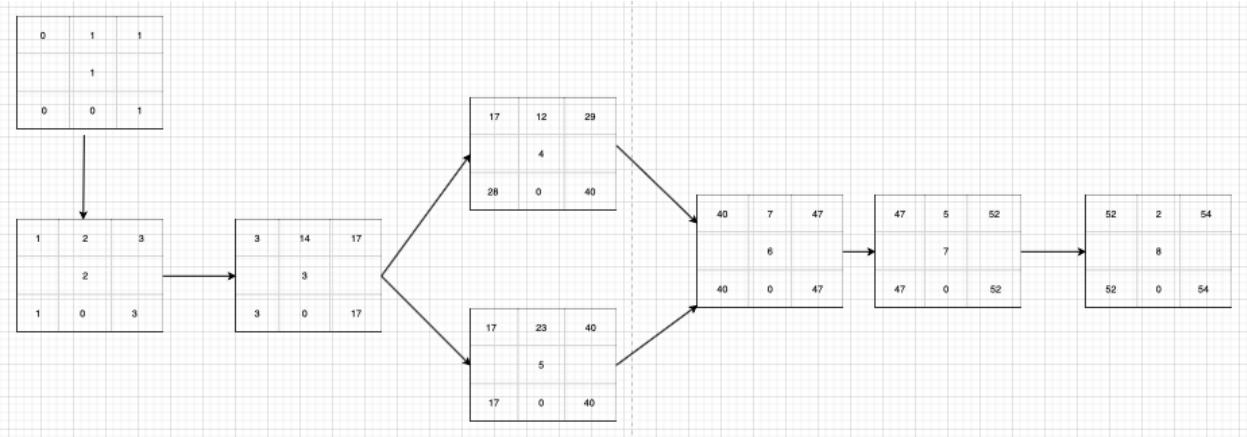
[Figure out the tasks required to complete your feature]

Example:

Work items

Task	Duration (days)	Predecessor Task(s)
1. Requirements Collection	1	-
2. World Design and Finalization	2	1
3. Skeleton/Draft in 3D on Unity with Colorization	14	2
4. Visual Refinement	12	3
5. Programming	23	3
6. Testing	7	4, 5
7. User Documentation	5	6
8. Installation	2	7

Pert diagram



Gantt timeline