

# Homework 5

The following are the compilation and execution instructions to be executed on a terminal at the level of the project folder.

## Compilation:

For compilation, execute the following instructions in the terminal. This will automatically generate the executables for all three games:

```
~~~  
make clean  
make all  
~~~
```

## 1) Execution of Game1:(SpaceJump)

Start the game server using the following command:

```
~~~  
./SpaceJumpServer  
~~~
```

Start the game clients using the following command:

```
~~~  
./SpaceJump  
~~~
```

If execution is not permitted then you may have to change execution permissions:

```
~~~  
chmod +x ./SpaceJumpServer  
chmod +x ./SpaceJump  
~~~
```

## Game Controls:

Key	Action
Up Arrow	Player Jumps.
Left Arrow	Player moves to the left.
Right Arrow	Player moves to the right.
P	Toggles Pause/Play Mode.
R	Increases Client Game Speed.

E	Decreases Client Game Speed.
W	Window mode changes.
Q	Start/Stop Recording.
S	Execute editing script.
Up/Down/Left/Right + S	Chord Sequence to increase health.

## Game Rules:

- Every character has a score that is constantly displayed on its terminal.
- A character must always keep moving in both X and Y directions in order to avoid being penalized on the score. Hence a character must always keep jumping.
- When a character hits moving platforms its score will be decreased.
- A character can increase their health by the input chord sequence “Up/Down/Right/Left Arrows + S”. If S is pressed earlier then the scale of the character increases which increases its probability of hitting the moving platforms.
- ‘S’ will run the editing script by reloading it, hence any changes to editing script will be visible in real-time. Same applies to animation which do not take inputs.

## 2) Execution of Game2:(TreasureHunt)

Start the game server using the following command:

~~~

```
./TreasureHuntServer
```

~~~

Start the game clients using the following command:

~~~

```
./TreasureHunt
```

~~~

If execution is not permitted then you may have to change execution permissions:

~~~

```
chmod +x ./TreasureHuntServer
```

```
chmod +x ./TreasureHunt
```

~~~

## Game Controls:

Key	Action
Up Arrow	Player traverses in the upper direction.
Left Arrow	Player moves to the left.
Right Arrow	Player moves to the right.
Down Arrow	Player traverses in the bottom direction.
P	Toggles Pause/Play Mode.
R	Increases Client Game Speed.
E	Decreases Client Game Speed.
W	Window mode changes.
Q	Start/Stop Recording.
S	Execute editing script.
Up/Down/Left/Right + S	Chord Sequence to increase health.

## Game Rules:

- The character is an adventurer who wants to collect as many coins as possible.
- The coins are in the cave and the cave is guarded by thunderbolts and sharp disks.
- When the character collides with the coin it's score is increased. A character can collect a coin only once.
- When the character is hit by a thunderbolt, its health is reduced.
- When the character is hit by sharp disks, it results in death and respawn.
- The score is always displayed on the client's terminal.
- Runtime editing can be done by changing the thunderbolt/ sharp disk speeds or the expanse or pattern of their movement.

### 3) Execution of Game3:(GrandMotoTorque)

Start the game server using the following command:

~~~

```
./GrandMotoTorqueServer
```

~~~

Start the game clients using the following command:

~~~

```
./GrandMotoTorque
```

~~~

If execution is not permitted then you may have to change execution permissions:

~~~

```
chmod +x ./GrandMotoTorqueServer
```

```
chmod +x ./GrandMotoTorque
```

~~~

### Game Controls:

Key	Action
Up Arrow	Car races in the upper direction.
Left Arrow	Car races in the left direction.
Right Arrow	Car races in the right direction.
Down Arrow	Car races in the downward direction.
P	Toggles Pause/Play Mode.
R	Increases Client Game Speed.
E	Decreases Client Game Speed.
W	Window mode changes.
Q	Start/Stop Recording.
S	Execute editing script.
Up/Down/Left/Right + S	Chord Sequence to increase health.

## Game Rules:

- The race car starts from the beginning and must complete the entire lap to go to the finish line.
- There are two mystery boxes in the race track. One box will put the car forward in the race whereas the other will take you behind.
- When a race car reaches the finish line it hits the win condition.(Not handled across servers due to consistency).

## Structure:

- All header files are placed in the include subdirectory.
- All the Game Entities are placed in the Entities subdirectory under the World subdirectory.
- All Components are placed in the World subdirectory.
- All engine subsystems are placed in separate subdirectories.
- The Games Entry Codes are placed in the Multiplayer subdirectory.
- All subsystems such as World, are decoupled and are ported together as recipes on the Game entry points.
- All the networking logic is implemented in the Networking subdirectory.
- Scripting system consists of a **ScriptManager**.
- **All the Games are placed in the GameProjects folder. Each game has a folder associated with it and named after it. The scripts for each game are placed in these folders.**

## Credits:

- Directory structure and code guidelines are inspired from several open source game engines like Hazel and ezEngine.
- The textures were made using Google Slides.
- The diagrams in the writeup are drawn using Excalidraw.