Mob Rush

Mob Rush is a hyper causal game designed for players willing to spend few minutes for each play section. The game mechanic is very simple, player need to move left or right to switch between different lanes, jump or dive to avoid obstacles on the run. Subway Surfer and Temple Run are great successful example.

Control and Movement

The control of the character is very easy and stright forward. Left arrow to switch to the lane on your left, right arrow to switch toward right, up arrow to jump and down arrow to dive underground. All movement of the character is controlled by translate.Translate modifying position and coroutine methods within Player.cs. I don't really want Physic to involve in here as this is designed as a very simple game and don't want to over complicated it. The only excpetion is the collision detection between player and blockage. (Will mention later below). An interuption prevent is also implemented so player cannot perform another action while already mid-action (e.g. switching lane in mid-air).

Map and Blockage

The map (or the road/field) is procedurally gerenated so they are endless and technically different in every playthrough. When player reaches checkpoints in the map (Checked by invisible collider), a new part of map with blockages randomly filled is gererate and placed into the game, while the old part of the map player just went pass is getting deleted from scene. Not only giving player a better experience, but also greatly increase performance and optimatzation as they will always be only 2 parts of the map in the scene (Maximum of 3 parts when entering checkpoint and awaiting deletion for a second). I initally thought about simply using a timer to control map generation (e.g. Every 10 second new map is gerenated and old one deleted) However, when I implemented the difficulty system(Will be explained below),I realized an time-based map generation could possibly cause problem if the player movement speed changes(Which also cause time required to complete each part of the map to change).

There are three type of blockage in the game:

Big rock(Full blockage): Block all movement, switching lane is the only option.
Small rock(Jumpable): Can be jumped over.
Overhead trap(Divable): Can dive underneath to dodge it.

Each type of blockage also has different variants so player doesn't have to look at the same rock everytime. Blockage collision is simply detected by collider, when player switch lane/jump/dive, the collider of the player naturally move along with the character to avoid hitting the blockages. But if the player reacted too slow (e.g. Trying to switch lane in front of the blockage but it's already too late), the collision will still happen and game over.

Each part of the map has multiple blockage points when blockage can spawn, at each blockage point, calculation will take part three spots, one on each lane. Firstly, it rolls a dice if any blockage will be spawn on this spot, if not, simply move on to the next spot. If yes, dice will be rolled again to choose which kind of blockage will be spawn(Full blockage, jumpable blockage or divable blockage?). Lastly just randomly choose one of the variants and instantiate it onto the map. Each blockage point also has a "Unpassable Prevention", which means it will prevent the rare case where the dice rolled 3 full blockages in a row (otherwise game will be broken as player is not possible to get pass here at all)

Score and difficulty

Currently the only way to gain score is time-based. Each second player will grant 2 points of score, so they are more like a "How long did you survive indicator ". Other ways such as pick up/power up would be great ways to gain score as well if they are impetemented.

I believe every game need some sort of progression system, which is why there is a difficulty mechanic already implemented into the game. Every 100 Score will raise the game difficulty sightly by increasing the movement speed of the character, making the player has less time to react. (Around 10% base movement speed increase per 100 score). However, the only issue here is while the speed can be greatly increased after certain play time, the lane switching speed, jump speed and dive speed donot change which could cause problems (Player runs very fast but dodge blockage with very slow reaction). Althernative way to achieve this is to impletement an acceleration factor that affect all action speed rather than a flat increase in movement. As this is just a simple game for testing I decided just to keep this simple for now.

Animation and Effect

The character model I used is imported from asset store and it came with animations. I created an animator for it and connected it with the functions within Player.cs, allowing it to play the correct animations based on player actions. An particle effect is also implemented when player performs the dive action to display the player is digging underground (I really wanted to find a better ground effect here but not able to find one so I used a modified fire effect).

Sound effects are also implemented to play when player jump, dive and hit a blockage. There is two different soundtrack which play in the start screen and in game. They are taken from one of my favourite indie roguelike games “Risk of Rain".

Assets used

StoneWalls Normal Maps https://assetstore.unity.com/packages/3d/stonewalls-normal-maps-64841
Low Poly Rock Pack https://assetstore.unity.com/packages/3d/environments/low-poly-rock-pack-57874
Meshtint Free Boximon Fiery Mega Toon Series https://assetstore.unity.com/packages/3d/characters/meshtint-free-boximon-fiery-mega-toon-series-153958
Free Pixel Font - Thaleah https://assetstore.unity.com/packages/2d/fonts/free-pixel-font-thaleah-140059
TrollNest Free UI Buttons https://assetstore.unity.com/packages/2d/gui/icons/trollnest-free-ui-buttons-140934
Dungeon Traps https://assetstore.unity.com/packages/3d/environments/dungeons/dungeon-traps-50655
Fantasy Arcade RPG Freedom World Sounds - Free Package https://assetstore.unity.com/packages/audio/music/fantasy-arcade-rpg-freedom-world-sounds-free-package-123530
videogame jump.wav https://freesound.org/people/kwahmah_02/sounds/262893/
Soundtrack of the game "Risk of Rain" https://store.steampowered.com/app/323410/Risk_of_Rain_Soundtrack/