Skateboarding Simulator Game Programming Task

1. System

   The developed skateboarding simulator includes basic movement and jumping mechanics, represented with corresponding animations, and a scoring system. The movement mechanic is powered by Unreal's "Character Movement Component". Once movement input is detected, the character's state machine is modified and a corresponding "speed up" animation is played. Using an animation notifier at a specific time during the animation's playback, the character's velocity is set to a hard-coded vector value and consequently is decreased by delta time in the "Tick" function to simulate friction. Similarly, when jumping input is detected, the state machine is again modified, and a jumping animation is played. Again, using an animation notifier, the actual jumping function is executed at a particular time during the animation and the skateboard mesh is attached to one of the bones of the character's skeleton. When the character lands, the skateboard is attached to an empty component whose transform is set to position the skateboard under the character as aesthetically as possible. The obstacles around the level are simple blueprints which are derived from a specially designed class that contains a box collider. When a collision between it and the character is detected, the total score (a float variable located in the game mode class) is increased by a particular value that can be set manually from the editor for each obstacle blueprint. The score value is printed on the UI canvas using Unreal's UMG module.

2. Controls
- **WASD keys – Move**
- **Space – Jump**
- **Mouse – Look**
- **Escape – Pause**

3. Critical reflection

The task was extremely appealing and thought-provoking. The time spent for the development of the movement functionality was around 6 hours, and the animations were done for 3. The UI features also took 3 hours to develop, and level design took 4 hours. The animations do not look as responsible as they were intended to and there are some offsets in the mesh during their execution. Nevertheless, the game turned out to be looking quite decent in the end.