# **CSC3232 Assignment**

# Gameplay

This game features 3 levels in total. The main idea is controlling the player fox through the challenges and collecting different types of items for gaining scores in each level. Once the player has successfully cleared all levels, the game will end in victory. However, when the player gets hit by enemy AI, the game is over. The gameplay of this project is a reference to Super Mario Bro.

Menu: Mouse click.

Player movement: W, S, A, D, SPACE or UP, DOWN, LEFT, RIGHT, SPACE

### **Screenshots**

1. Menu system + game UI (Usage of Unity SceneManager)

It allows players to switch between levels at any time. During game play, the player can restart the level if the game is over. It also shows the in-game scores and item quantities etc.





## 2. Graphic

All the levels were designed and painted through Tilemap enderer in Unity. The rain and other graphical effects were created by the particle system.



## 3. Physics and collision

All the game objects in the world contained different shapes of collider and rigidbody. Some of the characters were given a certain amount of force to maintain their movement.

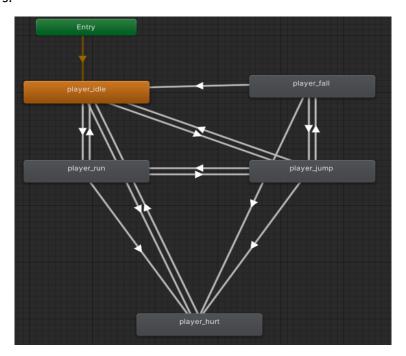






### 4. Animation

All the in-game items and characters, such as enemy AI, used the finite-state machine (FSM). FSM can change from one state to another in order to smooth the animation of the characters.



## 5. AI

There are two types of AI in this game. One is to use the A-Star algorithm to achieve simple pathfinding, and the other is to use the flocking algorithm to control a group of enemy AIs.

For A-Star pathfinding, when the player approaches the attacking range, enemy AI will calculate the nearest route to hunt player.



For flocking algorithm, AI and AI will neither interfere nor overlap with each other. They moved like a team with three basic behaviors: Alignment, Avoidance and Cohesion. In Alignment behavior, enemy AI can keep distance between itself and any nearby AI. In Avoidance behavior, enemy AI can prevent bumping into each other. In Cohesion behavior, enemy AI can move as a group without interrupting.

