CS7056 – Lab 2 – Terrain Representation

The purpose of this lab is to add geography to the West World code base from Lab 1 with a view to adding A* pathfinding later on.

You will probably want to add the code you will develop from now on to the code you have from Lab 1, so you don't have to merge the code bases later on.

As you solve the tasks, take notes about the decisions you made. You will need them for documenting your AI toolkit at the end of the semester.

Task 1: Add Geography to West World

See 'Representing the Search Space' course notes.

First, you need to decide on a game world representation. I suggest a simple 2D tiled map (i.e., a map consisting of squares) because that will allow you to (1) generate the navigation graph automatically; and (2) put the tiles on the screen quickly. You are also welcome to implement a 3D representation with free Unity assets if you prefer.

Each tile should have a type associated with it (e.g., plains or mountains) and an associated movement cost.

Task 2: Add the West World Locations

Decide how to represent the West World locations (mine, shack, etc.) in your game world. Depending on your representation, you may need code to map the locations from logical identifiers (that agents refer to in their FSMs) to grid cell identifiers (that tell where the locations are).

Task 3: And a Pinch of Randomness…

Add code that can generate the game world map randomly, i.e., place the West World locations in different places on the grid every time the game is started. You could start with a map of plain squares, add a suitable sprinkle of mountains and then place the West World locations (mine, shack, etc.) at random.

Task 4: Drawing West World

Add code to draw West World on the screen. I suggest drawing it as a simple top-down map, but this depends. You can use placeholders for the graphics or free Unity assets.

You may also want to include code that can change the shade of any given tile, such that you can visualise pathfinding results easily later on.

Task 5: Watch Your Agents Teleport

Hook up the map to your FSM and watch your agents teleport between locations. In the next lab, we will make them walk around the map proper.