Lab 1 Writeup

A computer screen with text and numbers

Description automatically generated

I decided that the easier a terrain type is, the faster it would be.

Point to point:

* Paved roads: Very smooth, made to be the fastest from one point to another
* Footpaths: Like paved roads (fastest from point to point), harder as they aren’t as smooth (rocks, tree roots, etc.)

No clear path:

* Open Land: Can go in any direction and is relatively easy to traverse
* Easy Movement Forest: Like Open Land but with trees in the way
* Rough Meadow: Difficult to traverse, lots of ditches, harder to see through
* Slow Run Forest: Denser forest but still able to move at a descent pace
* Walk Forest: Unable to slow run
* Lake/Swamp/Marsh: Can be traversed but extremely difficult due to thigh high water or the need to swim
* Impassible Vegetation: Not able to pass through (unless you have a machete)
* Out of Bounds: Self explanatory

A screen shot of a computer program

Description automatically generated

I implemented the heuristic function by considering the distance horizontally and vertically between the starting point on the path and the next point on the path as well as the elevation changes. By getting the difference between the 2 points and converting those into meters, it makes the implementation of the equation easier. I am adding the elevation to the difference of the y because they are both affecting the vertical and need to be accounted for.

The function is called multiple times throughout the A\* search which allows it to calculate all the possible points and return the best set of points to reach the final control point. It is also called during the calculation of total distance but only along the points that were added.