Intro to IS Lab 1 : Year-round Orienteering

Venkata Karteek Paladugu

Cost function:
Googled for average human speed in normal terrain and found to be approximately 1.4m/sec so i choose my speed accordingly for different terrains as follows

Open land   (248, 148, 18): 1.4 m/sec
Rough meadow   (255, 192, 0): 1.25 m/sec
Easy movement forest (255, 255, 255): 1.33 m/sec
Slow run forest   (2, 208, 60): 1.15 m/sec
Walk forest   (2, 136, 40): 1.05 m/sec
Impassible vegetation   (5, 73, 24): 0.15 m/sec
Lake/Swamp/Marsh   (0, 0, 255): 0.1 m/sec
Paved road   (71, 51, 3): 1.55 m/sec
Footpath   (0, 0, 0): 1.45 m/sec
Out of bounds   (205, 0, 101): 0.001 m/sec
On ice during winter   (63, 208, 212): 0.9 m/sec
On mud during spring   (139, 69, 19): 0.95 m/sec
Easy movement forest during fall   (255, 255, 255): 1.10m/sec

And when elevations are there since speed should decrease with elevation i calculated angle of elevation through cos of the angle and then increasing cost when there is positive slope(upper steep) and decreasing cost when there is negative slope(down streep) accordingly.

For calculating distance between two nodes calculated euclidean distance between two nodes.
.

Heuristic Function:
For Heuristic function calculated euclidean distance between a node and the goal destination.

Seasonal Algorithms:
During Fall changed the Easy Movement Forest speed because the path is not clear.

During winter while forming graph of all nodes initially kept track of all nodes which are borders of lake/pond and performed bfs on those nodes upto depth of 7 and made nodes which are water in the visited set to ice.

For spring while forming graph of all nodes initially kept track of all nodes which are borders of lake/pond and performed bfs on those nodes upto depth of 15 and made nodes which are not water in the visited to mud.
Total Distance:

Between two nodes which are horizontally adjacent difference in distance will be 10.29 m and nodes which are vertically adjacent difference in distance will be 7.55m and nodes diagonal ly adjacent distance will be 12.76 math.sqrt(7.55**2 + 10.29**2)

Total Time:
This is the total cost to reach the destination it is calculated based on the formulae
t = distance/speed between every two nodes, distance is determined by the above and speed is based on the terrain which are given initially in this document.