Assignment One

SOFE 3720/CSCI 4610: Introduction to Artificial Intelligence/Artificial Intelligence

Winter 2019
Dr. Sukhwant Kaur Sagar
Submission Deadline: Friday, February 15, 2019, 11:59 PM

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Github repository link : https://github.com/12mtc/AI-assignment-1

A* Search

For this assignment, the A* Search algorithm was used. The A* search algorithm is a tree search algorithm that is used for finding a path between two nodes. The nodes were taken from an OpenStreetMap XML file for a particular location in the city of Oshawa and the algorithm was used to find the shortest walking distance between two nodes. Elevation was also taken in account using HGT file which has elevations stored as simple binary integer data.

Nodes

```
<node id="904868031" visible="true" version="2" changeset="56453878" timestamp="2018-02-18T03:26:49Z" user="Matthew Darwin" uid="5633991"
 <tag k="addr:city" v="Oshawa"/>
 <tag k="addr:housenumber" v="289"/>
 <tag k="addr:street" v="Park Road South"/>
 <tag k="source" v="CanVec 6.0 - NRCan"/>
</node>
```

Ways

```
<way id="164604791" visible="true" version="2" changeset="35108854" timestamp="2015-11-05T18:47:43Z" user="brandoncote" uid="51600">
 <nd ref="1136740959"/>
 <nd ref="1136728515"/>
 <tag k="access" v="no"/>
 <tag k="highway" v="service"/>
 <tag k="oneway" v="no"/>
 <tag k="psv" v="yes"/>
</way>
```

Each point in the map is considered a node and from each node multiple ways are generated to the destination. Some roads also have restrictions to them (oneway, no access, etc.).

File Handling

The osm data files were parsed using xml.etree.ElementTree package that is included in the python interpreter.