**CSCI 6511 Artificial Intelligence**

**Ruocheng Shan**

**Project 1 Report – Uninformed and Informed Search**

**1. User Guide**

**1.1 Environment**

- Have Python 3.5 + installed in your device

- Install dependences by the commend

**pip install -r requirements.txt**

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**1.2 Run single case test on terminal**

- Run program by commend

**python main.py**

- Follow instructions to input

- Get the results in your terminal

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Note:

a. some end node is not reachable from the start node

b. if not specify start and end, a random pair will be generated

**1.2 Run all cases test on terminal**

- Run test script by commend

**python test.py**

- The program will generate 10 pairs of start and end nodes for each graph

- It takes a little while since randomly generated pair sometimes not reachable and will be re-generated

- A **.png** file will be create in the **results** folder

- The .png file is an analysis of comparison in actual runtime of each algorithm

- Logs will be printed in your terminal

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**2. Result Analysis**

**2.1 Time comparision**

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**2.2 Testing Result**

a. Total time cost of a same searching problem using Dijkstra is higher than using A\*

b. All nodes are visited in Dijkstra; a relatively small number of nodes are visited in A\*

**3. Algorithm Choice**

I chose Dijkstra for uninformed search and A\* for informed search. Since A\* has a heuristic function for each node, and we can consider the heuristic function for Dijkstra is all 0. Hence, these two algorithms are comparable.

For the heuristic calculation in A\*, I used Euclidian distance to measure. But for the up-to 8 neighbor nodes of a node, the h values is set to be 0 by definition.

**4. Project Structure**

Find the structure below for the project structure of source code:

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