

Homework Assignment 2: An Doan

Implements Dijkstra's algorithm, a graph ADT, a priority queue ADT, and a Monte Carlo simulation that calculates the average shortest path in a graph.

Screenshot 1: List of all the files in the zip file given.

```
an@ai1:~/cpp/hw2$ ls -la
total 32
drwxrwxr-x 2 an an 4096 Oct 21 19:30 .
drwxrwxr-x 4 an an 4096 Oct 20 19:48 ..
-rw-rw-r-- 1 an an 3424 Oct 21 18:22 graph.h
-rw-rw-r-- 1 an an 1388 Oct 21 18:53 main.cpp
-rw-rw-r-- 1 an an 357 Oct 21 16:38 makefile
-rw-rw-r-- 1 an an 2776 Oct 21 18:11 priority_queue.h
-rw-rw-r-- 1 an an 1252 Oct 21 19:16 README.txt
-rw-rw-r-- 1 an an 3010 Oct 21 18:10 shortest_path.h
an@ai1:~/cpp/hw2$ |
```

Screenshot 2: Output given when you run ./dijkstra

```
an@ai1:~/cpp/hw2$ make
g++ -Wall -c -g -std=c++11 main.cpp
g++ -Wall -g -std=c++11 main.o -o dijkstra
an@ai1:~/cpp/hw2$ ./dijkstra
Average shortest path for node 0 and Density .20: 6.81124
Average shortest path for node 0 and Density .40: 4.85883

Average shortest path for node 10 and Density .20: 8.31172
Average shortest path for node 10 and Density .40: 5.55771

Average shortest path for node 20 and Density .20: 9.0847
Average shortest path for node 20 and Density .40: 5.91613

Average shortest path for node 30 and Density .20: 8.57604
Average shortest path for node 30 and Density .40: 5.51464

Average shortest path for node 40 and Density .20: 6.88272
Average shortest path for node 40 and Density .40: 4.18558
```

How To Run Program On Linux:

1. Unzip the zip file: `unzip dijkstra.zip`
2. Use makefile to compile code: `make`
3. Run dijkstra: `./dijkstra`

```
an@ail:~/cpp/hw2/test$ ls -la
total 16
drwxrwxr-x 2 an an 4096 Oct 21 19:32 .
drwxrwxr-x 3 an an 4096 Oct 21 19:32 ..
-rw-rw-r-- 1 an an 5059 Oct 21 19:32 dijkstra.zip
an@ail:~/cpp/hw2/test$ unzip dijkstra.zip
Archive:  dijkstra.zip
  inflating: graph.h
  inflating: priority_queue.h
  inflating: shortest_path.h
  inflating: main.cpp
  inflating: makefile
an@ail:~/cpp/hw2/test$ ls -la
total 36
drwxrwxr-x 2 an an 4096 Oct 21 19:33 .
drwxrwxr-x 3 an an 4096 Oct 21 19:32 ..
-rw-rw-r-- 1 an an 5059 Oct 21 19:32 dijkstra.zip
-rw-rw-r-- 1 an an 3424 Oct 21 18:22 graph.h
-rw-rw-r-- 1 an an 1388 Oct 21 18:53 main.cpp
-rw-rw-r-- 1 an an 357 Oct 21 16:38 makefile
-rw-rw-r-- 1 an an 2776 Oct 21 18:11 priority_queue.h
-rw-rw-r-- 1 an an 3010 Oct 21 18:10 shortest_path.h
an@ail:~/cpp/hw2/test$ make
g++ -Wall -c -g -std=c++11 main.cpp
g++ -Wall -g -std=c++11 main.o -o dijkstra
an@ail:~/cpp/hw2/test$ ls -la
total 352
drwxrwxr-x 2 an an 4096 Oct 21 19:33 .
drwxrwxr-x 3 an an 4096 Oct 21 19:32 ..
-rwxrwxr-x 1 an an 115680 Oct 21 19:33 dijkstra
-rw-rw-r-- 1 an an 5059 Oct 21 19:32 dijkstra.zip
-rw-rw-r-- 1 an an 3424 Oct 21 18:22 graph.h
-rw-rw-r-- 1 an an 1388 Oct 21 18:53 main.cpp
-rw-rw-r-- 1 an an 203672 Oct 21 19:33 main.o
-rw-rw-r-- 1 an an 357 Oct 21 16:38 makefile
-rw-rw-r-- 1 an an 2776 Oct 21 18:11 priority_queue.h
-rw-rw-r-- 1 an an 3010 Oct 21 18:10 shortest_path.h
an@ail:~/cpp/hw2/test$ ./dijkstra
Average shortest path for node 0 and Density .20: 6.23905
Average shortest path for node 0 and Density .40: 4.85585

Average shortest path for node 10 and Density .20: 6.49223
Average shortest path for node 10 and Density .40: 5.018

Average shortest path for node 20 and Density .20: 6.48073
Average shortest path for node 20 and Density .40: 4.90865

Average shortest path for node 30 and Density .20: 6.43263
Average shortest path for node 30 and Density .40: 4.45144

Average shortest path for node 40 and Density .20: 6.43263
Average shortest path for node 40 and Density .40: 4.45144
```