**CS671 Artificial Intelligence**

**Programming 1**

Shuowen Wei

Math Department, [weis11@wfu.edu](mailto:weis11@wfu.edu)

The map file, saved as **map.txt**

Oradea Zerind 71

Zerind Arad 75

Arad Sibiu 140

Oradea Sibiu 151

Arad Timisoara 118

Timisoara Lugoj 111

Lugoj Mehadia 70

Mehadia Dobreta 75

Dobreta Craiova 120

Craiova Rimnicu 146

Rimnicu Sibiu 80

Sibiu Fagaras 99

Fagaras Bucharest 211

Craiova Pitesti 138

Pitesti Rimnicu 97

Pitesti Bucharest 101

Bucharest Giurgiu 90

Bucharest Urziceni 85

Urziceni Hirsova 98

Hirsova Eforie 86

Urziceni Vaslui 142

Vaslui Lasi 92

Lasi Neamt 87

* **Sample output 1:**

**Input:**

map, initial city=’Arad’, destination city=’Bucharest’

* **Algorithm 1: breadth-first Search**

clc;clear

initial='Arad';

dstn\_city='Bucharest';

map=importdata('map.txt');

[total\_cost] = bfs(map,initial,dstn\_city)

Output:

'Arad'

'Sibiu'

'Fagaras'

'Bucharest'

total\_cost =

450

* **Algorithm 2: depth-first Search**

clc;clear

initial='Arad';

dstn\_city='Bucharest';

map=importdata('map.txt');

[total\_cost] = dfs(map,initial,dstn\_city)

Output:

'Arad'

'Timisoara'

'Lugoj'

'Mehadia'

'Dobreta'

'Craiova'

'Pitesti'

'Rimnicu'

'Sibiu'

'Fagaras'

'Bucharest'

total\_cost =

1119

* **Algorithm 3: iterative deepening depth-first Search**

clc;clear

initial='Arad';

dstn\_city='Bucharest';

map=importdata('map.txt');

[total\_cost] = iterative\_dfs(map,initial,dstn\_city)

Output:

'Arad'

'Sibiu'

'Fagaras'

'Bucharest'

total\_cost =

450

* **Sample output 2:**

**Input:**

map, initial city=’Sibiu’, destination city=’Eforie’

* **Algorithm 1: breadth-first Search**

clc;clear

initial='Sibiu';

dstn\_city='Eforie';

map=importdata('map.txt');

[total\_cost] = bfs(map,initial,dstn\_city)

Output:

'Sibiu'

'Fagaras'

'Bucharest'

'Urziceni'

'Hirsova'

'Eforie'

total\_cost =

579

* **Algorithm 2: depth-first Search**

clc;clear

initial='Sibiu';

dstn\_city='Eforie';

map=importdata('map.txt');

[total\_cost] = dfs(map,initial,dstn\_city)

Output:

'Sibiu'

'Arad'

'Timisoara'

'Lugoj'

'Mehadia'

'Dobreta'

'Craiova'

'Rimnicu'

'Pitesti'

'Bucharest'

'Urziceni'

'Hirsova'

'Eforie'

total\_cost =

1247

* **Algorithm 3: iterative deepening depth-first Search**

clc;clear

initial='Sibiu';

dstn\_city='Eforie';

map=importdata('map.txt');

[total\_cost] = iterative\_dfs(map,initial,dstn\_city)

Output:

'Sibiu'

'Fagaras'

'Bucharest'

'Urziceni'

'Hirsova'

'Eforie'

total\_cost =

579

* **Sample output 3:**

**Input:**

map, initial city=’Dobreta’, destination city=’ Fagaras’

* **Algorithm 1: breadth-first Search**

clc;clear

initial='Dobreta';

dstn\_city='Fagaras';

map=importdata('map.txt');

[total\_cost] = bfs(map,initial,dstn\_city)

Output:

'Dobreta'

'Craiova'

'Rimnicu'

'Sibiu'

'Fagaras'

total\_cost =

445

* **Algorithm 2: depth-first Search**

clc;clear

initial='Dobreta';

dstn\_city='Fagaras';

map=importdata('map.txt');

[total\_cost] = dfs(map,initial,dstn\_city)

Output:

'Dobreta'

'Mehadia'

'Lugoj'

'Timisoara'

'Arad'

'Sibiu'

'Rimnicu'

'Craiova'

'Pitesti'

'Bucharest'

'Fagaras'

total\_cost =

1190

* **Algorithm 3: iterative deepening depth-first Search**

clc;clear

initial='Dobreta';

dstn\_city='Fagaras';

map=importdata('map.txt');

[total\_cost] = iterative\_dfs(map,initial,dstn\_city)

Output:

'Dobreta'

'Craiova'

'Rimnicu'

'Sibiu'

'Fagaras'

total\_cost =

445