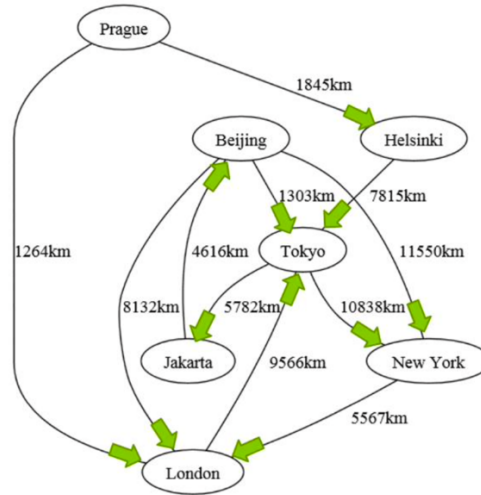


EHB 208E – Data Structures and Programming 2nd Homework Project Report

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This report explains how terminal part of the given project works. Since code itself has explained in the comment section of the code this report will mainly focus on terminal part.

When program has executed program asks user to enter the number of cities the compare. Since 7 cities are given in our homework 7 cities are entered. After that, program asks user to enter adjacency matrix. In graph theory, an adjacency matrix is a square matrix used to represent a finite graph. The elements of the matrix indicate whether pairs of vertices are adjacent or not in the graph. Our graph is given below:



Graph representation of our problem

If we want to represent this problem with adjacency matrix it looks like this:

	Prague	Helsinki	Beijing	Tokyo	New York	Jakarta	London
Prague	0	1845	0	0	0	0	1264
Helsinki	1845	0	0	7815	0	0	0
Beijing	0	0	0	1303	11550	4616	8132
Tokyo	0	7815	1303	0	10838	5782	9566
New York	0	0	11550	10838	0	0	5567
Jakarta	0	0	4616	5782	0	0	0
London	1264	0	8132	9566	5567	0	0

Adjacency matrix is given in the comment section of the code for user's convenience. In addition, program does not accept any input other than 7 for number of cities because in our problem 7 cities are given.

```
burakerdilbicer@Burak-MacBook-Pro EHB 208E HW2 % gcc datahw2.1.c
burakerdilbicer@Burak-MacBook-Pro EHB 208E HW2 % ./a.out

Enter the number of cities: 7

Enter the adjacency matrix:
0 1845 0 0 0 0 1264
1845 0 0 7815 0 0 0
0 0 0 1303 11550 4616 8132
0 7815 1303 0 10838 5782 9566
0 0 11550 10838 0 0 5567
0 0 4616 5782 0 0 0
1264 0 8132 9566 5567 0 0
```

User input for number of cities and adjacency matrix

After this, program asks user a starting city. This selected city is where the path begins. User can press 0 through 6 to select one of the cities given in the problem. In addition, program does not accept any input other than these options.

```
Enter the starting city:
Press 0 for Prague
Press 1 for Helsinki
Press 2 for Beijing
Press 3 for Tokyo
Press 4 for New York
Press 5 for Jakarta
Press 6 for London
```

User's selection part for starting city

Let's say user picked Jakarta, Indonesia. Program shows minimum distances from Jakarta to any other city and path needed for minimum distance. For example, if we want to get to Prague from Jakarta, minimum distance is found as 14012 km and pass from Beijing and London to get to Prague.

Other possible routes for other cities are shown below as well.

```
5
Closest distance between Jakarta ---- Prague :14012 km
Closest path: Prague <- London <- Beijing <- Jakarta

Closest distance between Jakarta ---- Helsinki :13597 km
Closest path: Helsinki <- Tokyo <- Jakarta

Closest distance between Jakarta ---- Beijing :4616 km
Closest path: Beijing <- Jakarta

Closest distance between Jakarta ---- Tokyo :5782 km
Closest path: Tokyo <- Jakarta

Closest distance between Jakarta ---- New York :16166 km
Closest path: New York <- Beijing <- Jakarta

Closest distance between Jakarta ---- London :12748 km
Closest path: London <- Beijing <- Jakarta
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```

All possible routes from Jakarta, Indonesia

```

6

Closest distance between London ---- Prague      :1264 km
Closest path: Prague  <- London

Closest distance between London ---- Helsinki :3109 km
Closest path: Helsinki <- Prague      <- London

Closest distance between London ---- Beijing :8132 km
Closest path: Beijing <- London

Closest distance between London ---- Tokyo      :9435 km
Closest path: Tokyo   <- Beijing   <- London

Closest distance between London ---- New York :5567 km
Closest path: New York <- London

Closest distance between London ---- Jakarta :12748 km
Closest path: Jakarta <- Beijing   <- London
burakerdilbicer@Burak-MacBook-Pro EHB 208E HW2 %

```

All possible routes from London, UK

```

4

Closest distance between New York ---- Prague :6831 km
Closest path: Prague  <- London      <- New York

Closest distance between New York ---- Helsinki :8676 km
Closest path: Helsinki <- Prague      <- London      <- New York

Closest distance between New York ---- Beijing :11550 km
Closest path: Beijing <- New York

Closest distance between New York ---- Tokyo :10838 km
Closest path: Tokyo   <- New York

Closest distance between New York ---- Jakarta :16166 km
Closest path: Jakarta <- Beijing   <- New York

Closest distance between New York ---- London :5567 km
Closest path: London  <- New York
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```

All possible routes from New York, US

```

3

Closest distance between Tokyo ---- Prague :9660 km
Closest path: Prague  <- Helsinki   <- Tokyo

Closest distance between Tokyo ---- Helsinki :7815 km
Closest path: Helsinki <- Tokyo

Closest distance between Tokyo ---- Beijing :1303 km
Closest path: Beijing <- Tokyo

Closest distance between Tokyo ---- New York :10838 km
Closest path: New York <- Tokyo

Closest distance between Tokyo ---- Jakarta :5782 km
Closest path: Jakarta <- Tokyo

Closest distance between Tokyo ---- London :9435 km
Closest path: London  <- Beijing   <- Tokyo
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```

All possible routes from Tokyo, Japan

2

```
Closest distance between Beijing ---- Prague :9396 km
Closest path: Prague <- London <- Beijing

Closest distance between Beijing ---- Helsinki :9118 km
Closest path: Helsinki <- Tokyo <- Beijing

Closest distance between Beijing ---- Tokyo :1303 km
Closest path: Tokyo <- Beijing

Closest distance between Beijing ---- New York :11550 km
Closest path: New York <- Beijing

Closest distance between Beijing ---- Jakarta :4616 km
Closest path: Jakarta <- Beijing

Closest distance between Beijing ---- London :8132 km
Closest path: London <- Beijing
burakerdilbicer@Burak-MacBook-Pro EHB 208E HW2 %
```

All possible routes from Beijing, China

1

```
Closest distance between Helsinki ---- Prague :1845 km
Closest path: Prague <- Helsinki

Closest distance between Helsinki ---- Beijing :9118 km
Closest path: Beijing <- Tokyo<- Helsinki

Closest distance between Helsinki ---- Tokyo :7815 km
Closest path: Tokyo <- Helsinki

Closest distance between Helsinki ---- New York :8676 km
Closest path: New York <- London <- Prague <- Helsinki

Closest distance between Helsinki ---- Jakarta :13597 km
Closest path: Jakarta <- Tokyo<- Helsinki

Closest distance between Helsinki ---- London :3109 km
Closest path: London <- Prague <- Helsinki
burakerdilbicer@Burak-MacBook-Pro EHB 208E HW2 %
```

All possible routes from Helsinki, Finland