Data structures and Algorithms: BFS Assignment

Due Date: April 26th

For this assignment, you will implement a breadth first search to find the shortest path for any selected nodes shown in the unidirectional graph in fig.1 to all connected nodes.

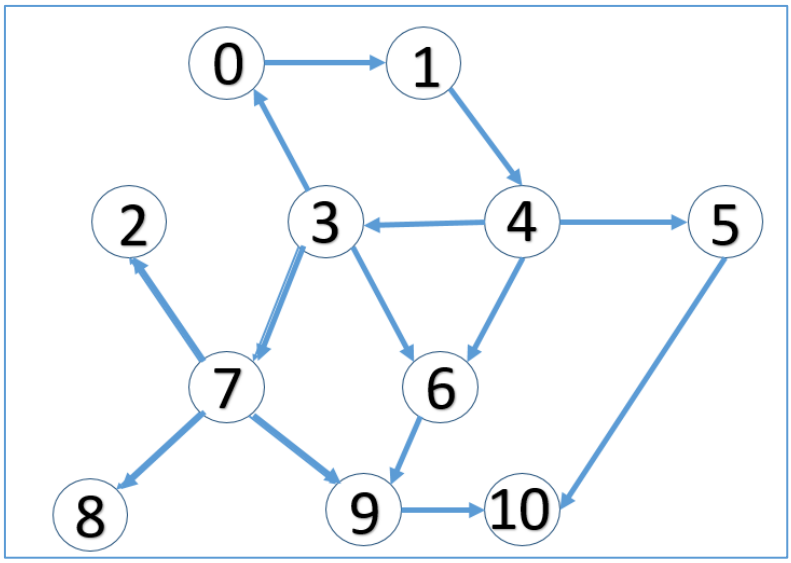

Fig.1

The numeric data at the bottom of the page represents the unidirectional connections on the graph. The top numbers represent the source node and the bottom number represents a connection to that node. This data is stored separately in a file and loaded into the program at runtime. When running the program the users should be able to choose the starting node from which all other nodes are connected.

For example if the user starts at 4, your program will display the paths connecting to each node to node four.

```
Sample Data
4 to 0: 4 -> 3 -> 0
4 to 1: 4 -> 3 -> 0 -> 1
4 to 2: 4 -> 3 -> 7 -> 2
4 to 3: 4 -> 3
4 to 4: 0
4 to 5: 4 -> 5
 . . .
4 to 10:4 -> 5 -> 10
```

To store graph arc, use either arrays or linked lists, the choice is left to your own discretion. An extra 10% will be given for using your own linked list class developed in tutorials.

Node connections

0	1	3	3	3	4	4	4	5	6	7	7	7	9
1	4	0	6	7	3	5	6	10	9	2	8	9	10

Marking scheme	%
Building fig.2 Graph form data in file	10
Breadth First Search	10
Data structure for storing graph data	15
Linked lists	10
Tracking marked nodes, arcs	10
Tracking the shortest distance	10
Graph output	15
Testing addition graph data	10
Code layout and commenting	10