furthestReachable

Your task is to write a function, furthestReachable, that returns the furthest vertex that is reachable from a given source vertex. If there are multiple furthest vertices, return the one with the largest vertex number. If the source vertex is not connected to any other vertices, return the source vertex.

Download

Click here to download a zip of the files.

The Files

Graph.c	Contains the implementation of a graph ADT
Graph.h	Contains the interface of the graph ADT
Queue.c	Contains the implementation of a queue ADT
Queue.h	Contains the interface of the queue ADT
testFurthestReachable.c	Contains the main function, which reads in a graph from standard input, calls furthestReachable for each vertex read in, and prints out the results.
furthestReachable.c	Contains furthestReachable, the function you must implement
Makefile	A makefile to compile your code
tests/	A directory containing the inputs and expected outputs for some basic tests
autotest	A script that uses the tests in the tests directory to autotest your solution. You should only run this after you have tested your solution manually.

Examples

Your program should behave like these examples:

```
$ ./testFurthestReachable
Enter number of vertices: 14
Enter number of edges: 12
Enter edges in the form v-w: 0-3 0-8 0-10 1-5 1-9 2-10 3-8 3-12 4-6 4-7 4-11 7-13

Graph: nV = 14
Edges:
 0: 0-3 0-8 0-10
 1: 1-5 1-9
 2: 2-10
 3: 3-0 3-8 3-12
 4: 4-6 4-7 4-11
 5: 5-1
 6: 6-4
 7: 7-4 7-13
 8: 8-0 8-3
 9: 9-1
10: 10-0 10-2
11: 11-4
12: 12-3
13: 13-7

Enter the source vertex: 10
Furthest vertex reachable from vertex 10: 12
Enter the source vertex: 12
Furthest vertex reachable from vertex 12: 2
Enter the source vertex: 5
Furthest vertex reachable from vertex 5: 9
Enter the source vertex: 6
Furthest vertex reachable from vertex 6: 13
Enter the source vertex: (Ctrl + D)
```

```
$ ./testFurthestReachable
Enter number of vertices: 12
Enter number of edges: 7
Enter edges in the form v-w: 0-1 2-3 3-4 5-10 5-9 9-11 10-11

Graph: nV = 12
Edges:
 0: 0-1
 1: 1-0
 2: 2-3
 3: 3-2 3-4
 4: 4-3
 5: 5-9 5-10
 6:
 7:
 8:
 9: 9-5 9-11
10: 10-5 10-11
11: 11-9 11-10

Enter the source vertex: 0
Furthest vertex reachable from vertex 0: 1
Enter the source vertex: 3
Furthest vertex reachable from vertex 3: 4
Enter the source vertex: 5
Furthest vertex reachable from vertex 5: 11
Enter the source vertex: 6
Furthest vertex reachable from vertex 6: 6
Enter the source vertex:
```

Hints

Only look at these hints if you are stuck.

Hint 1

Hint 2

Testing

You can test your program manually by compiling your code using `make`, and then running `./testFurthestReachable`, as shown above. After you are satisfied with your solution, you can autotest it by running `./autotest`. This will run some basic tests on your program.