Assignment 3

Suggested test cases (not the marking test cases)

Dear Students,

Hello! In order to help your work on assignment 3, I present the test cases that will use to mark your assignment 3 here. Please note that I may use another dataset to test your work, but will basically follow the following 13 test cases. I have also made a VPL for you to submit and test your work.

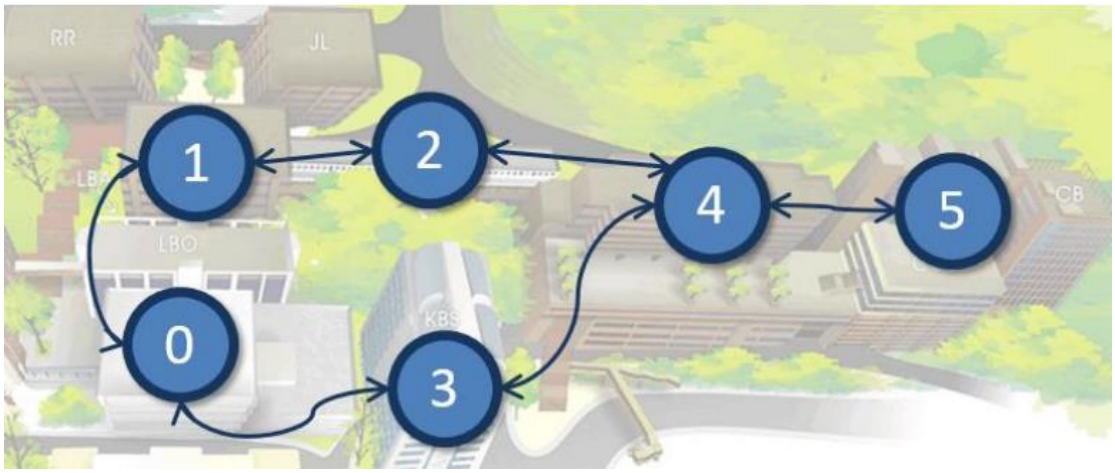
Please feel free to let me know if you have any doubt in the test case requirements. I am very happy to help you ☺

Best regards,

Kit.

You can check your program according to the following test cases:

1. We will call the `InsertNode` function in ascending order of the node ID. The following input is the same as the running example used in the specification.



Input 1	(Run the executable)
	`InsertNode 0 Library_Building`
	`InsertNode 1 Hui_Oi_Chow_Science_Building`
	`InsertNode 2 University_Street`
	`InsertNode 3 Kadoorie_Biological_Sciences_Building`
	`InsertNode 4 Haking_Wong_Building`
	`InsertNode 5 Chow_Yei_Ching_Building`

Output 1	(No screen output, the nodes are inserted into the graph.)

2. We will call the `InsertNode` function in any random order of the node ID.

Input 2	(Run the executable)
	`InsertNode 1 Hui_Oi_Chow_Science_Building`
	`InsertNode 5 Chow_Yei_Ching_Building`
	`InsertNode 0 Library_Building`
	`InsertNode 3 Kadoorie_Biological_Sciences_Building`
	`InsertNode 2 University_Street`
	`InsertNode 4 Haking_Wong_Building`

Output 2	(No screen output, the nodes are inserted into the graph.)

3. We will call the `InsertNode` function with node ID not starting from 0.

Input 3	(Run the executable)
	`InsertNode 10 Hui_Oi_Chow_Science_Building`
	`InsertNode 22 Chow_Yei_Ching_Building`
	`InsertNode 32 Library_Building`
	`InsertNode 25 Kadoorie_Biological_Sciences_Building`
	`InsertNode 11 University_Street`
	`InsertNode 9 Haking_Wong_Building`

Output 3	(No screen output, the nodes are inserted into the graph.)

4. We will call the `InsertNode` function with duplicate node ID, the node will not be inserted into the graph. The `InsertNode` function will output "`ID exists.`", followed by an `endl` on screen. The program should continue to process any upcoming commands after displaying the error message.

Input 4	(Run the executable)
	`InsertNode 0 Library_Building`
	`InsertNode 1 Hui_Oi_Chow_Science_Building`
	`InsertNode 2 University_Street`
	`InsertNode 3 Kadoorie_Biological_Sciences_Building`
	`InsertNode 4 Haking_Wong_Building`
	`InsertNode 5 Chow_Yei_Ching_Building`
	`InsertNode 5 Main Building`

Output 4	`ID exists.`

- Note that in the above test case the graph is built for the first 6 calls of `InsertNode` function.
- The program is still active to receive upcoming commands.

5. We will call the `InsertEdge(x,y)` function with both `x` and `y` exist in the graph.

Input 5	Assume that we continue with the inputs of test case 1.
	`InsertEdge 0 1`
	`InsertEdge 1 0`
	`InsertEdge 1 2`
	`InsertEdge 2 1`
	`InsertEdge 0 3`
	`InsertEdge 3 0`
	`InsertEdge 2 4`
	`InsertEdge 4 2`
	`InsertEdge 3 4`
	`InsertEdge 4 3`
	`InsertEdge 4 5`
	`InsertEdge 5 4`

Output 5	(No screen output, the edges are inserted into the graph.)

6. We will call the `InsertEdge(x,y)` function with either `x` or `y`, or both does not exists in the graph. `InsertEdge(x,y)` should output "`No such node.`" once, followed by an `endl` on screen.

Input 6a	Assume that we continue with the inputs of test case 1. `InsertEdge 100 1`
Output 6a	`No such node.`
Input 6b	Assume that we continue with the inputs of test case 1. `InsertEdge 1 100`
Output 6b	`No such node.`
Input 6c	Assume that we continue with the inputs of test case 1. `InsertEdge 100 100`
Output 6c	`No such node.`

7. We will call the `CommonNeighbor(x,y)` function where node `x` and `y` have common neighbors. If there are more than one common neighbors, output them in ascending order of the node ID, line by line.

Input 7	Assume that we continue with the inputs of test case 5.
	`InsertEdge 1 3`
	`InsertEdge 3 1`
	`CommonNeighbor 2 3`

Output 7	`1 Hui_Oi_Chow_Science_Building` `4 Haking_Wong_Building`

8. We will call the `CommonNeighbor(x,y)` function where node `x` and `y` do not have common neighbors. The function outputs "`No common neighbor.`", followed by an `endl` on screen.

Input 8	Assume that we continue with the inputs of test case 5. `CommonNeighbor 1 5`
Output 8	`No common neighbor.`

9. We will call the `CommonNeighbor(x,y)` function where node `x` and `y` are the same.

Input 9	Assume that we continue with the inputs of test case 5. `CommonNeighbor 0 0`
Output 9	`1 Hui_Oi_Chow_Science_Building` `3 Kadoorie_Biological_Sciences_Building`

10. We will call the `CommonNeighbor(x,y)` function with `x` or `y` or both does not exists in the graph. `CommonNeighbor (x,y)` should output "`No such node.`" once, followed by an `endl` on screen.

Input 10a	Assume that we continue with the inputs of test case 1. `CommonNeighbor 100 0`
Output 10a	`No such node.`
Input 10b	Assume that we continue with the inputs of test case 1. `CommonNeighbor 0 100`
Output 10b	`No such node.`
Input 10c	Assume that we continue with the inputs of test case 1. `CommonNeighbor 100 100`
Output 10c	`No such node.`

11. We will call the `ShortestPath(x,y)` function where node `x` and `y` have a path to return. If there are more than one shortest paths, output any one of them.

Input 11a	Assume that we continue with the inputs of test case 5. `ShortestPath 0 4`

Output 11a	`0 Library_Building`
	`3 Kadoorie_Biological_Sciences_Building`
	`4 Haking_Wong_Building`

Input 11b	Assume that we continue with the inputs of test case 5. `ShortestPath 1 5`

Output 11b	`1 Hui_Oi_Chow_Science_Building`
	`2 University_Street`
	`4 Haking_Wong_Building`
	`5 Chow_Yei_Ching_Building`

Input 11c	Assume that we continue with the inputs of test case 5. `ShortestPath 5 0`

Output 11c	`5 Chow_Yei_Ching_Building`
	`4 Haking_Wong_Building`
	`3 Kadoorie_Biological_Sciences_Building`
	`0 Library_Building`

12. We will call the `ShortestPath(x,y)` function where node `x` and `y` are not connected in the graph (i.e., there are no path to reach from `x` to `y` in the graph.). In this case, `ShortestPath(x,y)` outputs "`No path found.`" , followed by an `endl` on screen.

Input 12a	Assume that we continue with the inputs of test case 5.
	`InsertNode 6 University_Hall`
	`ShortestPath 0 6`

Output 12a	`No path found.`

Input 12b	Assume that we continue with the inputs of test case 5.
	`InsertNode 7 Clinical_Pathology_Building`
	`InsertNode 8 Faculty_of_Medicine_Building`
	`InsertEdge 7 8`
	`InsertEdge 8 7`
	`ShortestPath 8 0`

Output 12b	`No path found.`

Input 12c	Assume that we continue with the inputs of test case 5.
	`InsertNode 7 Clinical_Pathology_Building`
	`InsertNode 8 Faculty_of_Medicine_Building`
	`InsertEdge 7 8`
	`InsertEdge 8 7`
	`InsertEdge 3 8`
	`ShortestPath 7 0`

Output 12c	`No path found.`

Input 12d (say, if we have a one way shuttle from KBS to Medicine building)	Assume that we continue with the inputs of test case 5.
	`InsertNode 7 Clinical_Pathology_Building`
	`InsertNode 8 Faculty_of_Medicine_Building`
	`InsertEdge 7 8`
	`InsertEdge 8 7`
	`InsertEdge 3 8`
	`ShortestPath 0 7`

Output 12d	`0 Library_Building`
	`3 Kadoorie_Biological_Sciences_Building`
	`8 Faculty_of_Medicine_Building`
	`7 Clinical_Pathology_Building`

13. We will call the `ShortestPath(x,y)` function where node `x` and `y` are the same node.

Input 13a	Assume that we continue with the inputs of test case 5. `ShortestPath 0 0`
Output 13a	`0 Library_Building`
Input 13b	Assume that we continue with the inputs of test case 5. `ShortestPath 4 4`
Output 13b	`4 Haking_Wong_Building`

I wish you like this assignment and get a good grade in this task ☺ - Kit