Lab № 10

CSCI B505 Applied Algorithms 11/02/2022

Instructions

1. Please write the code for the problems in python language in Jupyter notebook
2. The code should readable with variables named meaningfully
3. Plagiarism is unacceptable and we have ways to find it. So do not do it.
4. Follow the instructions and define the methods/functions as given in the problem statement.
5. Write test cases wherever required so that they cover all scenarios.
6. Please do not use in-built python functions for solving the problem.

Problem 1

Given a graph represented in the form of adjacency matrix, perform the breadth first search of visiting the nodes and return the node values as you visit them. For a graph of n nodes, the adjacency matrix is defined as a 2-dimensional n×n list A, where $A[i][j](0 \leqslant i, j \leqslant n-1)$ is one if there is an edge between node i and j, and zero otherwise.

```
Example :
    Input:

    0
  /  \ \
  1  2  3
    /
   4
    A:
    [[0, 1, 1, 1, 0],
     [1, 0, 0, 0, 0],
     [1, 0, 0, 0, 1],
     [1, 0, 0, 0, 0],
     [0, 0, 1, 0, 0] ]

    Output: [0, 1, 2, 3, 4]
```

Use the following function prototype.

```
1
2 def BFS(A):
3 #
4 # perform BFS and return the values of nodes.
5 #
6     pass
```