

Programming Assignment  
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Data Structure Part 3: Graph  
B Tech (Information Technology and Mathematical Innovations)  
Due: 10th April 2020

### Programming Questions for Graphs

Design a graph node for a student having the following information

1. Roll no of students
2. Name of the student
3. Marks in Data Structure course
4. Give the distance of linking vertices of Graph as the difference of age of the students represented by two vertices.

And write a program with the user menu having the following functions.

1. Creation of Graph considering Roll No as unique information.
2. Insertion of the new student node in the existing Graph.
3. Breadth-First Search (BFS) | Iterative & Recursive Implementation
4. Depth First Search (DFS) | Iterative & Recursive Implementation
5. Arrival and Departure Time of Vertices in DFS.

### Documentation

You must document your functions. Each function should be commented with what the function does, its input parameters, and what it returns. Comments are very important and will account for 15% of your grade. Send mail with Subject: Data Structure Assignment Part 3-your Name-RollNo to my email id.

### Testing

You must thoroughly test your functions to ensure that they work. You will need to develop a main routine to test them and output the test results into a file. These results should be easily readable. For each routine, think about the type of input you might have and develop a test case for it.

### Deliverables

You must submit all source files in addition to your test files. Also, include a README file explaining how you tested your code and what problems you encountered. Note the code must be able to be compiled and executed on the Dev C++.

### Grading

Grading will be based on the following:

- 60% correct functionality
- 25% testing code
- 15% documentation