



ACADEMY OF TECHNOLOGY

Lab Assignment (Day 3)

Paper name: Design and Analysis of Algorithms Lab

Code: PCC-CS494

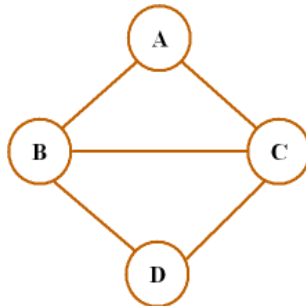
Discipline: CSE

Semester: 4th

Time: 2 Hours

Date: April 30, 2021

1. Write a program in C or C++ to read a graph from file and to store the graph in adjacency matrix. Implement the following operations.
 1. Find the number of edges of the graph.
 2. Find the total degree of the graph.
 3. Display the adjacent of a given vertex.
 4. Display the graph.



The information of the above graph is stored in a file *Ex.txt*. The first line indicates the number of vertices of the graph. Rest four lines show the adjacency information of the graph.

```
1 4
2 0 1 1 0
3 1 0 1 1
4 1 1 0 1
5 0 1 1 0
```

Compiler (3) Resources Compile Log Debug Find Results Close

Line	Col	File	Message
		C:\Program Files (x86)\Dev-Cpp\MinGW64\x86_64-w64...	C:\Users\DILIP MAITY\Desktop\PCC-CS-404\CODE\Ex.txt: file format not recognized; treating as linker script
		C:\Program Files (x86)\Dev-Cpp\MinGW64\x86_64-w64...	C:\Users\DILIP MAITY\Desktop\PCC-CS-404\CODE\Ex.txt:1: syntax error
		C:\Users\DILIP MAITY\Desktop\PCC-CS-404\CODE\colle...	[Error] ld returned 1 exit status

Line: 5 Col: 8 Sel: 0 Lines: 5 Length: 39 Insert Done parsing in 0 seconds

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The following C and CPP codes read the graph from the file and store the graph in adjacency matrix.

```
1  //C code
2  #include <stdio.h>
3  #include <stdlib.h>
4
5  int main () {
6      FILE *fp;    //create a pointer to a file
7      fp= fopen ("Ex.txt", "r"); //open a file in read mode,
           ex.txt must exist in the same directory
8           //otherwise it is requir to mention the absolute
           path
9      if (fp == NULL) {          //if file open failed then fopen()
           returns NULL
10         printf("\nError to open the file\n");
11         exit (1);
12     }
13
14     int n;
15     fscanf(fp,"%d",&n); //fscanf function read a data (in
           specified format as scanf())
16           //from file pointed by the pointer fp
17     int graph[10][10];
18     int i,j;
19     for(i=0;i<n;i++){
20         for(j=0;j<n;j++){
21             fscanf(fp,"%d",&graph[i][j]); //read a graph from file
22         }
23     }
24     for(i=0;i<n;i++){
25         for(j=0;j<n;j++){
26             printf("%3d",graph[i][j]); //read a graph from file
27         }
28         printf("\n");
29     }
30     fclose (fp); //to close the file
31     return 0;
32 }
```

```

1  //C++ code
2
3  #include<iostream>
4  #include<fstream>
5  using namespace std;
6  int main () {
7      fstream infile;    //create aa object of fstream class
8      infile.open("Ex.txt", ios::in); //open a file in read mode
9          (ios::in), ex.txt must exist in the same directory
10         //otherwise it is require to mention the
            absolute path
11  if (!infile) {        //to check whether the file is opened
12      printf("\nError to open the file\n");
13      exit (1);
14  }
15  int n;
16  infile>>n; //to read number of vertices from file
17  int graph[10][10];
18  int i,j;
19  for(i=0;i<n;i++){
20      for(j=0;j<n;j++){
21          infile>>graph[i][j]; //read a graph from file
22      }
23  }
24  for(i=0;i<n;i++){
25      for(j=0;j<n;j++){
26          printf("%3d",graph[i][j]); //read a graph from file
27      }
28      printf("\n");
29  }
30  infile.close (); //to close the file
31  return 0;
32  }

```

2. Write a program in C or C++ to read a graph from file and store it in adjacency list. Then implement the following operations.
 1. Find the number of edges of the graph.
 2. Find the total degree of the graph.
 3. Display the adjacent of a given vertex.
 4. Display the graph.