

**Gebze Technical University
Computer Engineering**

CSE 222 - 2018 Spring

HOMEWORK 7 REPORT

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1 Q1

This part about Question1 in HW7

1.1 Problem Solution Approach

For Graph creation I used Edge class .Edge class has v1 -v2 and w=weight components.
A public constructor of Edge allows disabling of non parameter given creation of objects.

For Graph Plot i like this

starting with 1

printing 1's childs(connected adjacents) then looking for childs of 1->2 ->4

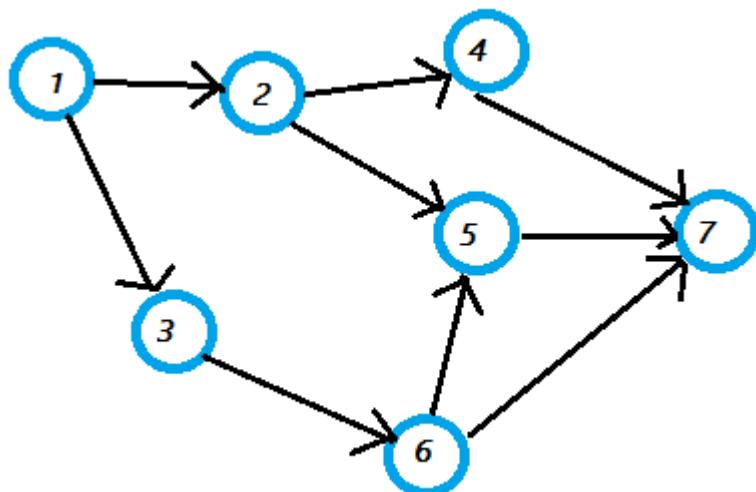
1->3 ->6 etc

Shortest path takes 3 param and calculates shortest path by looking for each one.

Also calculating total path distance while calculating.

IsUndirected looking for repeated situations and returns boolean accordingly.

1.2 Test Cases



I used this structure in my code. This works perfectly fits acyclic graph with directed structure.

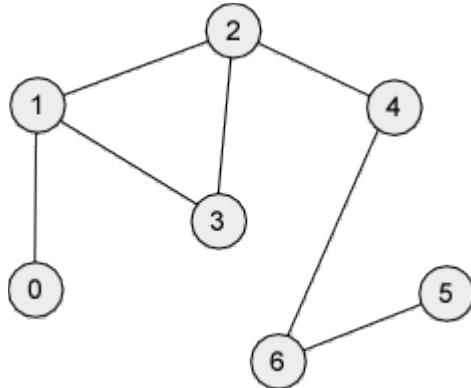
2 Q2

This part about Question2 in HW7

2.1 Problem Solution Approach

This part only differs from first Q1 with undirected structure instead of directed. Rest of graph creation-plot algorithm is same. PlotGraph is little modified for no arrows.

2.2 Test Cases



3 Q3

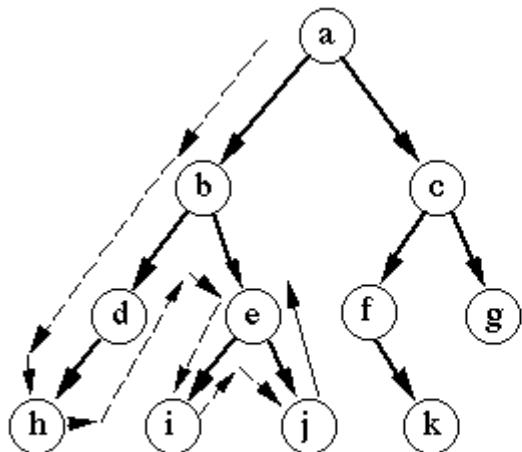
This part about Question3 in HW7

3.1 Problem Solution Approach

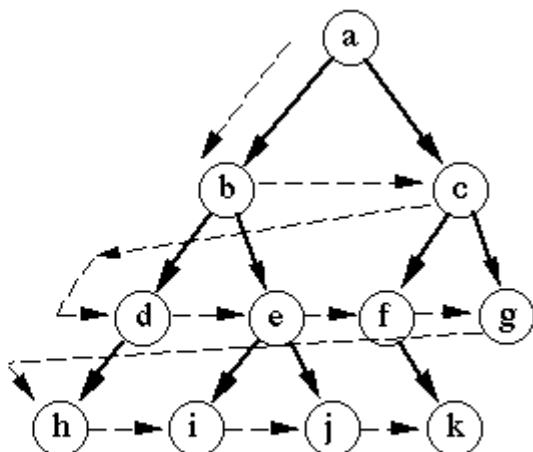
This part while is implemented is not working correctly i didnt have a lot time because of Project for Friday and SystemProgramming Final for Sunday so i couldnt relook the code.

3.2 Test Cases

This was my test case if it was working correctly.



Depth-first search



Breadth-first search

Question 4

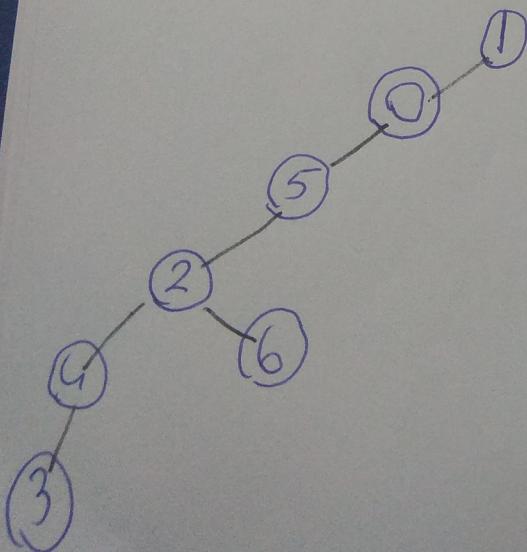
Differences between

BFS

- BFS in Graph Visit nodes level by level
- A node is fully explored before any other can begin
- Uses Queue data structure to store unexplored nodes
- BFS is slower and require more memory

Applications

- finding all connected components in a graph
- finding shortest path between two nodes
- testing graph for bipartiteness



Depth first Search & Breadth first search (BFS)

DFS

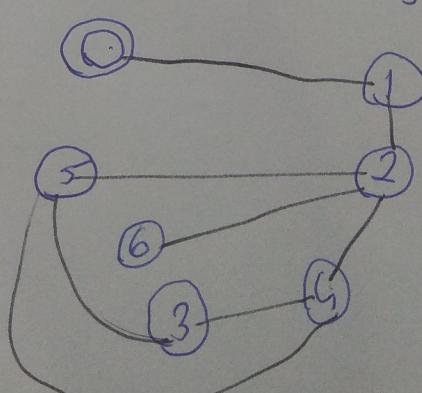
- DFS Visit nodes of graph depth wise.

- Exploration of a node is suspended as soon as another unexplored is found
- Uses Stack data structure
- DFS is faster and require less memory

Applications

Topological Sorting

- finding connected components
- finding cut vertices of graph



Visited

1 0 5 2 4 3 6