# Gebze Technical University Computer Engineering

# CSE222/Homework 8 Report


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# Part one : Definition of the problem and requirements

## a)Definition of the problem:

-Define a DynamicGraph interface by extending the Graph interface in the book for the following definition of graph data structure. Write a MyGraph class for the implementation of DynamicGraph interface.

-Write a method that takes a MyGraph object as a parameter and performs BFS and DFS traversals.

-Write a method that takes a MyGraph object and a vertex as a parameter to perform a modified version of Dijkstra's Algorithm for calculating the shortest paths from the given vertex to all other vertices in the graph.

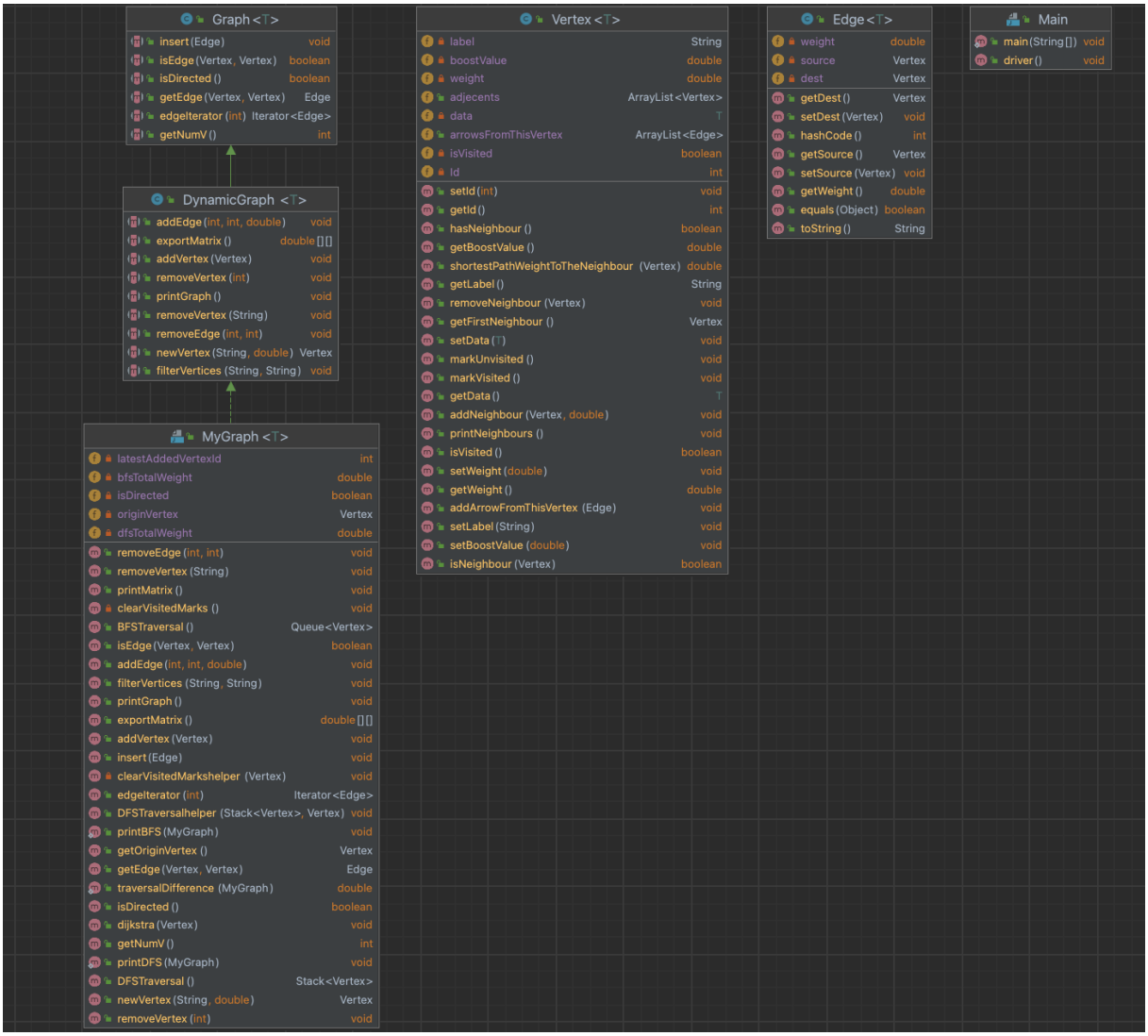
## b)Requirements:

->Implementing DynamicGraph interface

->Implementing functions for BFS and DFS

-> Implementing a function for dijkstra algorithm

# Part two : Class Diagrams




# Part three : Problem solution approach

Given methods by homework pdf is implemented for MyGraph class.

Vertex class is implemented as generic class and vertices keeps datas.Vertices keeps it's neighbours and edges that starts from that vertex within array lists.Vertex has addNeighbour() method that adds neighbour vertex and sets edge automatically.Edge class and it's methods are taken from the book.MyGraph has printGraph and printMatrix to print graph.

# Part four : Test Cases

```
java com.YagizHakki.Main
Graph is printed in adjacency list format :
2 --> 0 --> 3 --> 4

0 --> 1 --> 3 --> 2

3 --> 3

4

1 --> 2


Graph printed as matrix below...
     0      1      2      3      4
0   0,00   4,00   2,00   22,00   0,00

1   0,00   0,00   3,00   0,00   0,00

2   4,00   0,00   0,00   5,00   1,00

3   0,00   0,00   0,00   6,00   0,00

4   0,00   0,00   0,00   0,00   0,00


Dfs treversal order --> 2   0   1   3   4

Bfs treversal order --> 2   0   3   4   1
Difference between traversals --> 0,000000

From vertex 0 to...
1  -->  4,00
2  -->  2,00
3  -->  7,00
4  -->  0,00
 Edge between vertices 0 and 3 --> [(0, 3): 22.0]%
yagiz@p-MacBook-Air hw8 %
```