Course: Graph Theory

Programming Activity

1. Download the following files available in the Activity 1:
   - Input files describing graphs: `G1.in`, `G2.in`, and `k5.in`.
   - Program: `program.cpp`.
2. Run the program for all graphs. Check if the answer from the program is correct according to the description in the input files, i.e. check the vertices and their adjacencies.
3. In a piece of paper, draw the graphs described in `G1.in` and `k5.in`.
4. Write a method to print all the adjacencies of a given vertex. Write a method for both the adjacency list and the adjacency matrix:

```
// print neighbors of a vertex v (adjacency list)
void AdjList_print_adj(int v){
    // your code here
}

// print neighbors of a vertex v (adjacency matrix)
void AdjMatrix_print_adj(int v){
    // your code here
}
```

5. Write a method to verify if two given vertices are adjacent. It must return `true` or `false`. Write a method for both the adjacency list and the adjacency matrix:

```
// verify if vertices u and v are adjacent (AdjList)
bool AdjList_is_adj(int u, int v){
    // your code here
}

// verify if vertices u and v are adjacent (AdjMatrix)
bool AdjMatrix_is_adj(int u, int v){
    // your code here
}
```

6. Write a method to calculate and return the degree of a given vertex. Write a method for both the adjacency list and the adjacency matrix:

```
// calculate the degree of a vertex (AdjList)
int AdjList_degree(int u){
    return Vet[u].Adj.size();
}

// calculate the degree of a vertex (AdjMatrix)
int AdjMatrix_degree(int u){
    // your code here
}
```