Data Structures and Algorithms
Laboratory – **List 12**

To the applications from previous list (List 10) add the following function:

1. `int* SSSP(Graph &g, int s)` - implementation of single source shortest paths for source vertex `s`, using Dijkstra's algorithm. Assumptions: the procedure if has two vertices with the same minimum value chooses the one with smaller index of vertex. The function has to return an array of distances for every vertex.

Assumptions: There is a path from s to every other vertex.

For **10 points** present solutions for this list till **Week 14**.
For 8 **points** present solutions for this list till **Week 15**.
After Week 15 the list is closed.

Appendix 1

All instruction from list 10 and 11 have to be active.
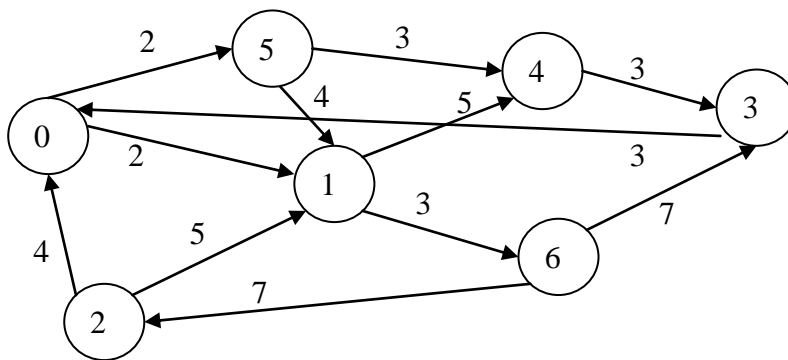Additional instruction:

If a line has a format:
```
SS u
```
your program has to call SSSP(g,u) for current graph g, and present the returned array in following format:
0(<value from index 0>)
1(<value from index 1>)
…

A graph from example test:

For example for input test:

```
GO 2
LG 7 12
0 5 2
5 1 4
1 4 5
4 3 3
3 0 3
0 1 2
1 6 3
2 0 4
2 1 5
6 2 7
5 4 3
6 3 7
SS 2
HA
```

The output have to be:

```
START
!GO 2
```

```
!LG 7 12
!SS 2
0(4)
1(5)
2(0)
3(12)
4(9)
5(6)
6(8)
!HA
END OF EXECUTION
```