Exercise 3. Answer Sheet

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Problem 1. *(25 points)* Consider the following adjacency matrix:

0 1 1 1 0 0

1 0 1 0 0 0

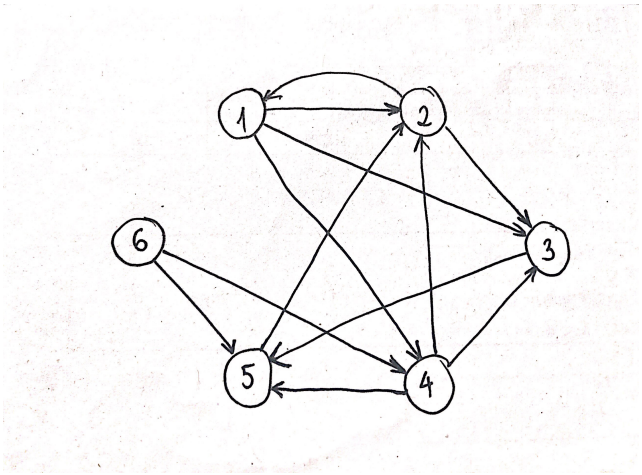
0 0 0 0 1 0

0 1 1 0 1 0

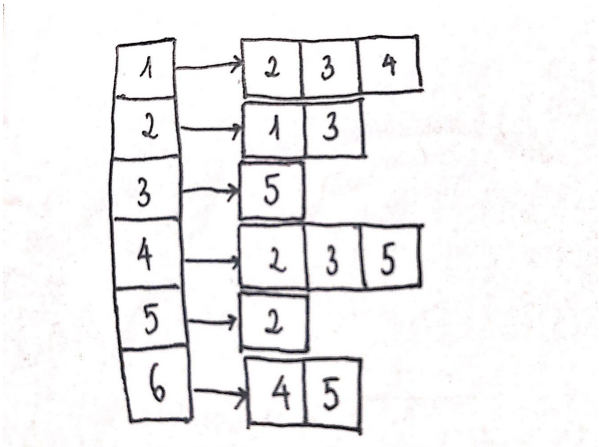
0 1 0 0 0 0

0 0 0 1 1 0

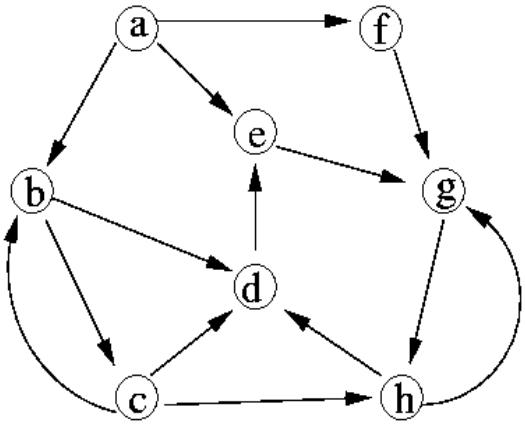
a) Draw a directed graph which corresponds to this adjacency matrix.



b) Write the adjacency list of the graph from a).



Problem 2. *(25 points)* Consider the following graph:



a) Starting from vertex a, in what order the Breath First Search algorithm will traverse the vertices of this graph?

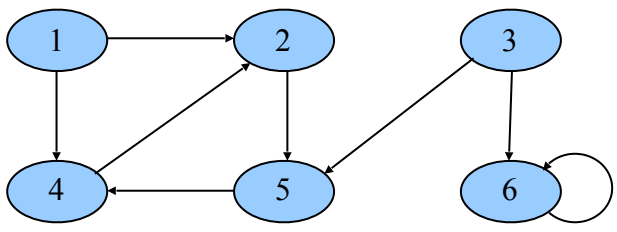
The order the BFS algorithm will traverse the vertices of this graph is: a, b,e,f,,c,d,g,h.

b) Starting from vertex a, in what order the Depth First Search algorithm will traverse the vertices of this graph?

Node	a	b	c	d	e	f	g	h
Discovery time	1	2	3	4	5	14	6	7
Finishing time	16	13	12	11	10	15	9	8

The order the DFS algorithm will traverse the vertices os this graph is: a, b, c, d, e, g, h, f

Problem 3. *(50 points)* Based on the pseudo-code for Depth First Search algorithm given at the lecture, write a program implementing it. Given the following graph, starting from node 1, calculate the discovery and finishing time of each node and fill the table starting from node 1. (Don't forget to upload your program!)



Node	1	2	3	4	5	6
Discovery time	1	2		4	3	
Finishing time	8	7		5	6	

To run the program, change the directory to the directory where we saved the file and run the following command lines:

```
g++ -o DFS.o DFS.cpp
./DFS.o
```

The output will be: