

# Data Structures and Algorithms

## Exercises Week 9

For exercises 1 to 4 below, the digraph is given by the following incidence matrix:

|   | A | B | C | D |
|---|---|---|---|---|
| A |   | x | x |   |
| B |   |   | x |   |
| C |   |   |   | x |
| D | x |   |   |   |

1. Draw the graph corresponding to the incidence matrix above.
2. Perform a depth first traversal on your graph from exercise 1 starting from vertex A and selecting edges in alphabetic order of end vertex label.
3. Perform a breadth first traversal on your graph from exercise 1 starting from vertex A and selecting edges in alphabetic order of end vertex label.
4. Apply Floyd-Warshall's Algorithm to your graph from exercise 1, numbering the vertices in alphabetic order.
5. Apply the algorithm for topological ordering of the vertices in the DAG given by the following incidence matrix.

|   | A | B | C | D | E | F | G | H |
|---|---|---|---|---|---|---|---|---|
| A |   | x | x | x |   |   |   |   |
| B |   |   |   |   | x |   |   |   |
| C |   |   |   |   |   | x |   |   |
| D |   |   |   |   |   |   | x |   |
| E |   |   |   |   |   | x |   | x |
| F |   |   |   |   |   |   | x |   |
| G |   |   |   |   |   |   |   |   |
| H |   |   |   |   |   |   |   |   |