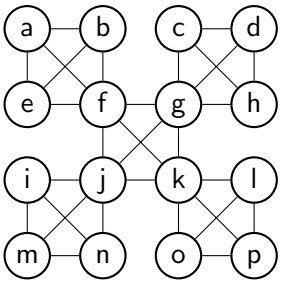
Coursework 1

COMP2721 Algorithms and Data Structures II

1. Execute breadth-first search and depth-first search on the following graph. Start at vertex `a` and handle neighbours in alphabetical order.

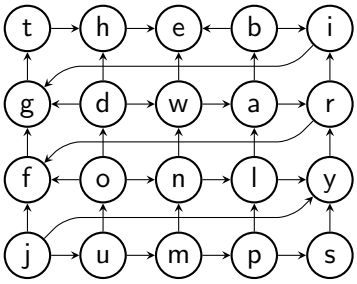


   Mark the edges of the BFS-tree in a drawing of the graph. For each vertex v give its BFS-number $\sigma(v)$ and the vertices in the queue at the time v is dequeued.

   Mark the edges of the DFS-tree in a drawing of the graph. For each vertex v give its DFS-number $\sigma(v)$ and the vertices in the stack, that is, the vertices u for which `DFS-visit`(u) starts before and terminates after `DFS-visit`(v).

   [0:30h expected time] [5 marks]

2. Execute topological sort on the following directed graph. If there is a choice handle vertices in alphabetic order. For each vertex v give its number $\sigma(v)$.



   [0:30h expected time] [5 marks]

Submission: Work out and present your solution on paper. Stitch together all your sheets and a filled header form and submit via SSO. Indicate date and time of your tutorial, that is, one of the following:

- Tuesday 12–1
- Tuesday 4–5
- Friday 1–2
- Friday 2–3

For a proof of submission, convert your solution into portable document format (via `pdflatex` if you use LaTeX or scan your manuscript) and submit it in Minerva.

Deadline: Monday 17 February 2020, 10am.

Credits: This piece of summative coursework is worth 5% of your grade.