SIT320 — Advanced Algorithms

Credit Task 11: **Network-based Algorithms**

> At the completion of the module (**Module 11: Network-based Algorithms**), you are required to fill a lesson by doing following activities.
>
> Your tutor will then review your submission and will give you feedback. If your submission is incomplete they will ask you to include missing parts. They can also ask follow-up questions, either to clarify something, or to double check your understanding of certain concepts.

Task List

- **(0)** Provide a short overview of what you learned in the module. This should be based on your learning summary from lecture (seminar), module content on cloud Deakin, your interaction with Unit Chair/Tutors/Peers, your research in the library or the internet and/or your interaction with chatGPT (make sure to provide the prompts you use).

  - You summaries in C/D/HD tasks are more important than they are in P tasks. Make sure you provide a minimum one-page (11 sized font) summary that highlights your key take aways from this module.

- **(1)** Karger's algorithm finds a minimum cut based on the number of edges. What if we have weights on the edges. How would you modify Karger's algorithm (or design a new algorithm) to take into account edge weights?

  - You are not expected to write any code here, but design an algorithm. You can present your algorithm in form of a pseudo-code, paragraph, or video recording.

  - You are expected to make any reasonable assumptions about the problem, to simplify your formulation of proposed algorithm.

- **(2)** Write code for Ford-fulkerson algorithm and apply it on the following problem (one we discussed in the seminar):

  - Your algorithm should print the values of max flow and min cut.

  - Make sure your algorithm prints the edges involved in the minimum-cut.

  - You are welcome to write code from scratch, but are allowed to look over the internet, e.g., https://www.programiz.com/dsa/ford-fulkerson-algorithm. If you are using code from the internet or chatGPT, make sure you document it that demonstrates your understanding of the code. Your tutor will discuss the salient features of the code with you.