School of Information Technology, Deakin University

SIT320 — Advanced Algorithms

Pass Task 5 — **Graphs I**

About this Task

At the completion of the module (**Module 5: Graphs I**), you are required to fill a lesson review 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).
- **(1)** Bidirectional search is used to find the shortest path between a source and a destination. It operates by essentially running two simultaneous breadth-first searches one from each node. When their searches collide, we have a match. Design an algorithm for bi-directional search, and then code it in this week's ipynb.
- **(2)** Design an algorithm using BFS to determine if a graph is bi-partite. Modify the BFS code in this week's lab book, and implement your designed algorithm.
- **(3)** Write an algorithm for finding Strongly Connected Components in a graph. Code about Node and Graph is given you you — you are expected to extend this code. Refer to cloud Deakin page to find the definition of strongly connected component.