School of Information Technology, Deakin University

SIT320 — Advanced Algorithms

Pass Task 7 — **Dynamic Programming**

About this Task

At the completion of the module (**Module 7: Dynamic Programming**), 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)** You are running up a staircase with a total of n steps. You can hop either 1 step, 2 steps or 3 steps at at time. Write a DP program to determine how many possible ways you can run up the stairs? (Hint: Start with a recursive solution, and then later move to top-down approach of DP).
- **(2)** Write the code for finding the Longest Common Sub-sequence. Make sure you output the Matrix C and the longest sub-sequence. Make sure you test your algorithms for various test-cases.
- **(3)** You have been given the code for unbounded knapsack. Based on the algorithm discussed in this seminar, implement a solution to do 0/1 Knapsack. Make sure you test your algorithms for various test-cases.