School of Information Technology, Deakin University

SIT320 — Advanced Algorithms

Pass Task 3: **Design Patterns**

About this Task and its related Module

At the completion of the module (**Module 3: Design Patterns**), 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)** In module 1, we wrote an algorithm for tic-tac-toe, and in module 2, we re-factored the code to build a program with stable design. Let us now imagine, that we have a client, who is asking us to build a framework for playing multiple games. The are particularly interested in playing a) tic-tac-toe, b) backgammon, and c) chess. For each of these algorithms, they want a minimax solution as well as reinforcement learning algorithm solution. An ideal design should be able to incorporate multiple games as well as multiple algorithms in future. Use your understanding of factory patterns to build the class diagram for the framework. You are expected to code the bare skeleton application — again there is no need to implement strategies for backgammon or chess, as we have not covered them yet.
- **(2)** Download the Python code for observer pattern (from code section of the module), demonstrate your understanding of the code by doing one of the following:
  - Modification of the code
  - Coming-up with new use-cases as well as test-cases
  - Finding limitation of the code
  - Providing succinct summary of the operations, etc.