7143CEM Programming for Data Science — Portfolio (draft version)

Task 2. Design, build and test (ILO2)

Unicorn vs Pegasus is a simple dice game for one player. The aim is to collect all the body parts of either a Unicorn or a Pegasus (both mythical horse-like creatures). Rolling an unbiased eight-sided dice, a 1 gives a body, 2 gives a tail, 3 gives a leg, 4 gives a head, 5 gives an eye, 6 gives a mouth, 7 gives a wing, and 8 gives a horn. A player must collect a body before any other body parts can be added. A player must collect a head before any eyes, mouth or horn can be added.

Before you write any code, it is worth playing this game a few times using a pencil, paper and an eight-sided dice (or use https://rolladie.net/roll-a-d8-die). Choose whether you are going to build a Unicorn or Pegasus before you begin.

(1) Implement this game as one Python function. The function should have one parameter which is used to select whether a Unicorn or a Pegasus is built. Follow the steps and logic you take in a physical game. Your code should include enough print statements to generate a clear nontrivial example illustrating a play of the game, telling the story as the dice is rolled and the creature's body parts are assembled. Explain carefully what steps you have taken to test your code (not just debugging). *Please provide both your code and the output from one sample run for each of Unicorn and Pegasus.*

[15 marks]

(2) Modify your Python code to add at least three *counts* that effectively summarise a game, e.g., how many dice rolls are made. Use these summary counts to compare building a Unicorn with building a Pegasus. Also implement a variant in which the player builds one complete Unicorn and one complete Pegasus in parallel (while carefully satisfying the precedence of body parts for both creatures), and compare the resulting counts with those of the original game (making some relevant conclusions). *Please provide separate Python code for the original game with counts and the variant, together with output from sample runs of each and a comparison of counts in a table for the Unicorn-only, Pegasus-only and both-in-parallel versions.*

[10 marks]