

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

Task 2. Design, build and test (ILO2)

Beetle is a simple dice game for one player. The aim is to collect all the body parts of a Beetle. Rolling an unbiased six-sided dice, a 1 gives a Beetle body, 2 gives a head, 3 gives an antenna, 4 gives an eye, 5 gives a mouth, and 6 gives a leg. The player must collect a Beetle body before any other body parts can be added. The player must collect a Beetle head before any antennae, eyes or mouth can be added. A complete Beetle consists of one body, one head, two antennae, two eyes, one mouth, and six legs.



Image from: <https://www.alzproducts.co.uk/beetle-game>

Before you write any Python code, it is worth playing this game using a pencil, paper and a six-sided dice (or use <https://rolladie.net/>).

- (1) Implement this dice game as one Python function. Follow the steps and logic you would 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 Beetle body parts are assembled. Explain carefully (with evidence) how you have used “incremental development” while implement your Python code. *Please provide both your code and the output from one sample run. You must not implement a Python class. Do not attempt to produce a graphical visualisation. The storytelling should be sufficient to be able to test your code by looking only at the output it produces. Marks will be given for both the quality of code and the quality of the storytelling.*

[15 marks]

- (2) Modify your Python code to add at least three counts that effectively summarise different aspects of the game. These counts should vary from game to game and you are encouraged to think creatively. Use these summary counts to compare the original game described above with the variant in which the player needs to build a “mutant” Beetle that has one body but two complete heads. *Please provide your updated Python code for the original game with counts, the Python code for the mutant Beetle, together with output from one sample run of each. Provide a summary table of counts for the two game versions, along with a clear and robust conclusion based on your results.*

[10 marks]