COMP3702 Artificial Intelligence (Semester 2, 2022)
Assignment 0 – Part 2

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Question 7   Begin with sets $U = \{u \in \mathbb{N}_0 : u < 5\}$ and $V = \{a, b, c, d, e\}$, and write scripts to generate the following sets:

- Generate $U \times V$.

- A set consisting of the set of all subsets of a set is called a *powerset*: $\mathcal{P}(X) = \{Y : Y \subseteq X\}$. Generate the powerset of V, $\mathcal{P}(V)$.

What is the size of each set? Write a sentence commenting on the relative size of the two sets.

(Complete your full answer to Question 1 on the remainder page 1)

Set u contains all the numbers 0,1,2,3,4, therefore has it a length of 5. Set V has also size of 5. The set product consists of tuples where all elements of X, is paired with every element of Y. In this case, will this be $5 \cdot 5 = 25$ tuples.

The power set contains all combinations of the set V. That means, every element of V is both in and not in one of the sets in the power sets. To calculate this number, we take two to the power of the size of the set, which is $2^5 = 32$.