CA3 - Assignment - 40%

Graph Theory:
Write a clear explanation of **one of the three algorithms for forming a minimal spanning tree (MST):**

- Borůvka's algorithm
- Prim's algorithm
- Reverse-delete algorithm

Note that you ***cannot*** choose Kruskal's algorithm, as we studied that in class.

Your explanation must be neatly presented and clearly explained. Ideally, you should include an introduction, a full and clear explanation (with an example graph) and a conclusion.

(16 points)

Probability:

1. What is the probability of rolling exactly two 6s in five rolls of a fair die?
2. The number of industrial injuries on average per working week in a factory is 0.75. Assuming that the distribution of injuries follows a Poisson distribution, find the probability that in a particular week there will be no more than two accidents.

Show clearly how you found your answer and justify any decisions made.

(8 points)

Statistics:
Download the attached **diamonds** dataset. It contains a subset (1,000 diamonds) from a much larger dataset. Metadata can be found here: https://www.kaggle.com/datasets/shivam2503/diamonds
Produce two different plots to explore the relationship between the **price** of the diamonds and one or more of the 4 Cs of a good diamond: **cut**; **colour**; **clarity**; and **carat**. Clearly describe your findings.
You may produce the plots using Excel, Python, Google Sheets or otherwise.