Assignment 5

Tanmay Goyal - AI20BTECH11021

Download all python codes from

https://github.com/tanmaygoyal258/AI1103---Probability/tree/main/Assignment5/code.py

and latex-tikz codes from

https://github.com/tanmaygoyal258/AI1103---Probability/blob/main/Assignment5/main.tex

1 Problem

Let X and Y denote the sets consisting 2 and 20 distinct elements respectively and F denote the set of all possible functions defined from X and Y. Let f be randomly chosen from F. The probability of f being one to one is :

2 Solution

We know, every $x \in X$ can be mapped to one of 20 elements in Y.

$$n(F) = 20 \times 20 = 400 \tag{2.0.1}$$

For one to one functions, the first element in X has 20 choices to be mapped, and second element has only 19 choices(to avoid repetition).

$$n(f) = 20 \times 19 = 380 \tag{2.0.2}$$

Required probability:

$$\frac{n(f)}{n(F)} = \frac{380}{400} = \frac{19}{20} \tag{2.0.3}$$