Assignment 1

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Download all python codes from

https://github.com/diya−goyal−29/AI1103/tree/main/Assignement\%201/Code

and latex - tikz codes from

https://github.com/diya−goyal−29/AI1103/blob/main/Assignment%201/Assignment%201.tex

Question 1.19 :
Harpreet tosses two different coins simultaneously (say, one is of rupee 1 and other of rupees 2). What is the probability that she gets at least one head?
Solution :
Total number of coins = $n = 2$
The total no. of outcomes = 4
Let p = probability of head = $\frac{1}{2}$
q = probability of tail = $\frac{1}{2}$
X = number of heads

Probability of at least one head

$$= Pr(X = 1) + Pr(X = 2) \tag{1}$$
$$= {}^2C_1 \times p \times q + {}^2C_2 \times p^2 \tag{2}$$
$$= {}^2C_1 \left(\frac{1}{2}\right)\left(\frac{1}{2}\right) + {}^2C_2 \left(\frac{1}{2}\right)^2 \tag{3}$$
$$= 2 \times \frac{1}{4} + \frac{1}{4} \tag{4}$$
$$= \frac{3}{4} \tag{5}$$
$$= 0.75 \tag{6}$$