Assignment 4

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I. Problem-CBSE-9th Q)example 2

Q)Two coins are tossed simultaneously 500 times, and we get

$$Two\ heads : 105\ times$$
$$One\ head : 275\ times$$
$$No\ head : 120\ times$$

Find the probability of occurrence of each of these events.

II. Solution

Theoretical probability:
If two coins are thrown there are four outcomes
{H H}, {T H}, {H T} and {T T}
Now, probability of getting no head

$$Pr(No\ head) = \frac{^2C_0}{4} = \frac{1}{4} \tag{1}$$

Probability of getting one head

$$Pr(One\ head) = \frac{^2C_1}{4} = \frac{1}{2} \tag{2}$$

Probability of getting two head

$$Pr(Two\ head) = \frac{^2C_2}{4} = \frac{1}{4} \tag{3}$$

Practical probability:
Denote the outcome of the experiment by a random variable $X \in \{0,1,2\}$.
Where X = 0 denotes occurrence of two heads, X = 1 denotes occurrence of one head and X = 2 denotes the occurrence of no head. Then,

$$Pr(X = 0) = \frac{105}{500} = 0.21 \tag{4}$$
$$Pr(X = 1) = \frac{105}{500} = 0.55 \tag{5}$$
$$Pr(X = 2) = \frac{105}{500} = 0.24 \tag{6}$$

Observe that

$$Pr(X = 0) + Pr(X = 1) + Pr(X = 2) = 1$$

Also X = 0 ,X = 1 and X = 2 cover all the outcomes of a trial.