

Assignment 3

AI1110: Probability and Random Variables

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Question 8

A die is thrown three times,

$$P(A | B) = \frac{P(A \cap B)}{P(B)} \quad (5)$$

E : 4 appears on the third toss,

F : 6 and 5 appears respectively on first two tosses.

∴ The probability of the problem being solved, P(Solved) will be given by

Determine $P(\frac{E}{F})$

$$P(E | F) = \frac{P(E \cap F)}{P(F)} \quad (6)$$

Solution.

Probability of 4 appearing on the third toss,

P(E): $\frac{1}{6}$

Probability of 6 appearing on the first toss,

P1: $\frac{1}{6}$

Probability of 5 appearing on the second toss,

P2: $\frac{1}{6}$

$$P(E | F) = \frac{(\frac{1}{256})}{(\frac{1}{36})} \quad (7)$$

$$P(E | F) = \frac{1}{6} \quad (8)$$

∴ The probability $P(\frac{E}{F})$ will be 1/6.

Probability of 5 appearing on the second toss
AND 6 appearing on the first toss, P(F) is given
as:

$$P(F) = P1 \times P2 \quad (1)$$

$$= \frac{1}{6} \times \frac{1}{6} = \frac{1}{36} \quad (2)$$

Probability of E AND F, $P(E \cap F)$ is given as:

$$P(E \cap F) = P(E) \times P(F) \quad (3)$$

$$= \frac{1}{6} \times \frac{1}{36} = \frac{1}{256} \quad (4)$$

We know that,

Probability of A occurring IF B occurs, $P(A|B)$
is given as: