AI 1110 Assignment 1

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12.13.2.12 Question: A die is tossed thrice. Find the probability of getting an odd number at least once.

Answer: $\left(\frac{7}{8}\right)$

Solution:
Let $'p'$ be the probability of getting an odd number atleast once.
Then $'p'$ is equal to the compliment of getting an even number on every die toss.
Now since,

$$P(A) + P(\bar{A}) = 1 \tag{1}$$

This implies that,
P(getting an odd number at least once on the die) = 1 - P(getting an even number on every die toss)
$\therefore$ For this event, (i.e. of getting an even number on all the three outcomes),
The total favourable outcomes are 3 {2,4,6} out of all the possible outcomes 6 {1,2,3,4,5,6}.
$\therefore$ From Equation 1,

$$\begin{aligned} & p = 1 - \left(\tfrac{3}{6} * \tfrac{3}{6} * \tfrac{3}{6}\right) \\ \implies \quad & p = 1 - \left(\tfrac{1}{2}\right)^3 \\ \implies \quad & p = 1 - \tfrac{1}{8} \\ \implies \quad & p = \tfrac{7}{8} \end{aligned}$$

Hence,
Answer: The probability of getting an odd number atleast once on tossing the die three times is equal to $\left(\frac{7}{8}\right)$.