AI1103: Assignment 4

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Download all python codes from

https://github.com/srivatsav01/Assignment−4/blob/main/Assignment_4.ipynb

and latex-tikz codes from

https://github.com/srivatsav01/Assignment−4/blob/main/Assignment−4.tex

GATE 1999(CS) Question 1

A die is rolled three times The probability that exactly one odd number turns up among the three outcomes is?

Solution

Let **X** be the random variable such that it represents number of times an odd number appeared .
Let **Y** be the random variable such that it represents number of times an even number appeared .
Let **C** be the event that exactly one odd number appears in 3 outcomes.
$\Pr(X = m, Y = n) = \binom{m+n}{m} \times \left(\frac{1}{2}\right)^{m+n}$

$$\Pr(\mathbf{C}) = \Pr(X = 1, Y = 2) \tag{1}$$

$$\Pr(X = 1, Y = 2) = \binom{1+2}{1} \times \left(\frac{1}{2}\right)^{1+2} \tag{2}$$

$$\Pr(X = 1, Y = 2) = \binom{3}{1} \times \left(\frac{1}{2}\right)^{3} \tag{3}$$

$$\Pr(X = 1, Y = 2) = \frac{3}{8} \tag{4}$$

$$\Pr(\mathbf{C}) = \Pr(X = 1, Y = 2) \tag{5}$$

$$\Pr(\mathbf{C}) = \frac{3}{8} \tag{6}$$