Assignment 6

Dontha Aarthi-CS20BTECH11015

Download latex-tikz codes from

1 GATE 2014 (ME-SET1), Q.10 (APTI SECTION)

You are given 3 coins: one has heads on both faces, the second has tails on both faces, and the third has a head on one face and a tail on the other. You choose a coin at random and toss it, and it comes up heads. The probability that the other face is tails is

1) $\dfrac{1}{4}$

2) $\dfrac{1}{3}$

3) $\dfrac{1}{2}$

4) $\dfrac{2}{3}$

2 SOLUTION

Let, $X = \{0, 1, 2\}$ be a random variable representing the 3 coins:

1) $X = 0$: Coin with heads on both faces

2) $X = 1$: Coin with tails on both faces

3) $X = 2$: Coin with head on one face and tail on another face

Probability for choosing a coin is

$$\Pr(X = 0) = \Pr(X = 1) = \Pr(X = 2) = \frac{1}{3} \quad (2.0.1)$$

Let, $Y = \{0, 1\}$ be a random variable representing the outcomes of the coin, 0 for heads and 1 for tails.

$$\Pr(Y = 0) = \Pr(Y = 1) = \frac{1}{2} \quad (2.0.2)$$

Given that, on choosing a coin at random and tossing it, heads comes up and we have to find the probability for the other face to be tails.

Since there is only one coin that has both head and tail as faces, therefore the probability is same as choosing that coin i.e.,

$$\Pr(X = 2) = \frac{1}{3} \quad (2.0.3)$$