Probability&RV Assignment-02

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https://github.com/Anuradha−Uggi/Assignments−AI5002−Probability−and−Random−Variables/blob/main/Prob_ass02/PmfRvsp.py

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I. QUESTION(1.12)

A coin is biased so that the head is 3 times as likely to occur as tail.if the coin is tossed twice,find the probability distribution of number of tails.

II. SOLUTION

Given that the coin is biased.when coin is tossed once then Probability of occurrence of Head is = 3 times the occurrence of tail.Lets assume that the possible outcomes of a coin toss are random in nature and its represented by a random variable y.where

$y = 0$ is the outcome of occurrence of Head and $y = 1$ is the outcome of occurrence of Tail.then

$$P(y = 0) = 3P(y = 1) \tag{1}$$

when the coin is tossed twice then the possible outcomes are $00, 01, 10, 11$.

as the coin is biased

$$P(y = 0) = \frac{3}{4}$$

$$P(y = 1) = \frac{1}{4}$$

$X = 0$ represents no tails i.e both are heads

$X = 1$ represents 1 tail and other is head

$X = 2$ represents 2 tails and no heads

Let X represents number of Tails and P(X) represents the distribution of X which can be expressed as

X	0	1	2
P(X)	$\frac{3}{4} \times \frac{3}{4}$	$\frac{3}{4} \times \frac{1}{4}$	$\frac{1}{4} \times \frac{1}{4}$

III. CONCLUSION

Probability Distribution of Number of Tails is obtained as below.