Assignment 14

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Download all python codes from

https://github.com/ka−raja−babu/Matrix−Theory/tree/main/Assignment14

and latex-tikz codes from

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1 Question No. 6.17

A person plays a game of tossing a coin thrice. For each head, he is given Rs 2 by the organiser of the game and for each tail,he has to give Rs 1.50 to the organiser. Let X denote the amount gained or lost by the person. Show that X is a random variable and exhibit it as a function on the sample space of the experiment.

2 Solution

Let X_0, X_1, X_2 be the three tosses of coin such that head and tail represent success and failure respectively .

Sample Space	X_0	X_1	X_2
HHH	1	1	1
HHT	1	1	0
HTH	1	0	1
THH	0	1	1
TTH	0	0	1
THT	0	1	0
HTT	1	0	0
TTT	0	0	0

TABLE 2.1: Values of $X_{i=0,1,2}$

From table 2.1 and table 2.2, it can be inferred that X_0, X_1, X_2 represents a sequence of independent Bernoulli random variables and hence,it represents a Bernoulli process.

	X_0	X_1	X_2
$\Pr(X_i{=}0)$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$
$\Pr(X_i{=}1)$	$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{2}$

TABLE 2.2: Probability of $X_{i=0,1,2}$

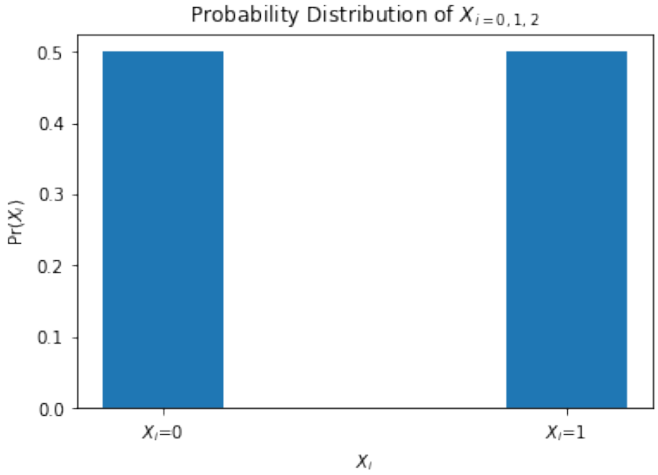

Fig. 2.1: Probability Distribution of $X_{i=0,1,2}$