Assignment 4

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Question: Two coins (a one rupee coin and a two rupee coin) are tossed at once. Find the sample space.

Solution:

Given: A pair of two distinguishable coins.

To find: The sample space of the when the two coins are tossed simultaneously,

Let us denote the events of tossing one coin and two coins simultaneously by random variables X and Y respectively.

Let Sample space of X be S_x,where:

$$S_x = \{H, T\} \tag{1}$$

Where, H denotes Head and T denotes Tail.

Let Sample space of Y be S_y and we know that S_y will be the cartesian product of S_x with itself:
Such that:

$$S_y = S_x \times S_x \tag{2}$$

So,the sample for tossing two coins at a time can be given as:
S_y = (x,y) : x is the outcome of the first coin and y is the outcome of the second coin
And thus,

$$S_y = \{(H, H), (H, T), (T, H), (T, T)\} \tag{3}$$