Random Variable (R.V)

Random Variable is a function that assigns values to each of an experiment's outcomes.

Question - (1)

Step 1:- R.E → Tossing two Coins.

Step 2:- S.S → {HH, HT, TH, TT}

Step 3:- R.V → X → Counting the no. of Heads.

Random variable (is denoted by X)

$X = \{0, 1, 2\}$ → 2 heads

0 heads (TT)

1 head (HT, TH)

Step 4:- Calculate the probability for R.V

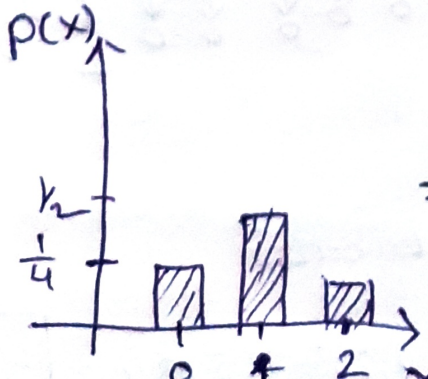
$\frac{1}{4}$ = P(X=0) = $\frac{1}{4}$ {TT}

$\frac{1}{2}$ = P(X=1) = $\frac{2}{4}$ = $\frac{1}{2}$ {HT, TH}

$\frac{1}{4}$ = P(X=2) = $\frac{1}{4}$ {HH}

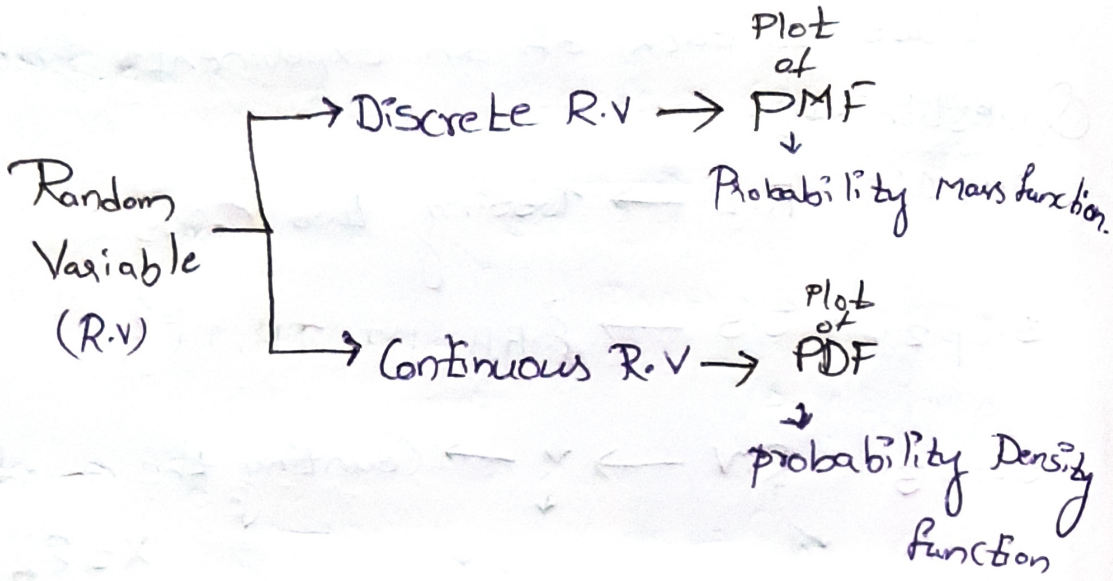
This is known as Probability Distribution.

Step 5:- plot the Probability Distribution (or) PMF (Probability Mass function)



⟹ plot of probability Distribution (or) Plot of PMF

→ Random Variable is of two types



Example:

Question — ②

Step 1:- R.E → Rolling a dice

Step 2:- S.S → {1, 2, 3, 4, 5, 6}

Step 3:- R.V → Y → Getting a "6" is Success.

Note:- Let, Success → 1
Failure → 0

S.S → {1, 2, 3, 4, 5, 6} → {0, 0, 0, 0, 0, 1}

∴ Y = {0, 1}

Step 4:- Probability Distribution

$P(Y=0) = \{1,2,3,4,5\} = \frac{5}{6}$

$P(Y=1) = \{6\} = \frac{1}{6}$

→ Probability Distribution

Step-5:- plot the probability Distribution(PMF)