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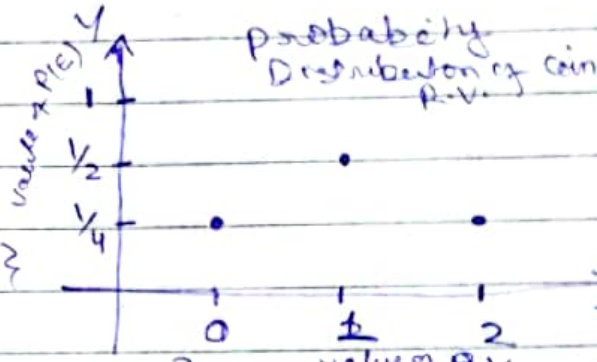
→ Conditional Probability

Let E_1 an event & E_2 an conditional event
(Hint)

$$P(E_1 | E_2) = \frac{P(E_1 \cap E_2)}{P(E_2)}$$

* Random variable (RV)



RE → flipping 2 coins
SS → {HH, TH, HT, TT}
RV → X → count no. of heads
So, for {HH HT TH TT}
HH → x=2, HT → x=1, TH → x=1, TT → x=0

⇒ X : SS → {0, 1, 2}

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

$P(x=1) = P(TH, HT) \Rightarrow \frac{2}{4}$ $P(\{HT\} \cup \{TH\}) = P(HT) + P(TH)$

$\Rightarrow \frac{1}{4} + \frac{1}{4} = \frac{1}{2}$

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

There is Probability distribution

RE = Rolling 2 dice

SS → {(1,1), (1,2), (1,3), (1,4), (1,5), (1,6),
⋮ ⋮ ⋮ ⋮ ⋮ ⋮
(6,1), (6,2), (6,3), (6,4), (6,5), (6,6)}

R.V. → Y → Sum of values that you see on dice

Y : SS → {2, 3, 4, ... 12}

$P(x=2) = P(1,1) = \frac{1}{36}$

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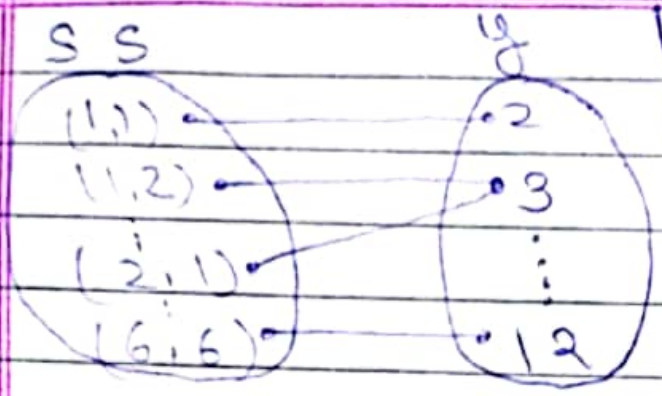

$P(X=3) = P(\{1,2\},\{2,1\}) = \frac{1}{18}$

$P(X=4)$

$P(X=12) = 1/36$

∴ this is Probability Distribution

$P(X=i)$ → Probability distribution

→ Types of Random variable

Discrete R.V. → Continous R.V.

$X: SS \to \{0,1,2\}$ — expiry of an electronic device

Countable