

# Assignment Probability

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probability

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## 1 Problem

by using binomial distribution

1. Q:12,13,4,4

$$P(X) = {}^nC_X p^X q^{n-X}$$

### 1.1 Problem

Thus, the required probability distribution is

Find the probability distribution of

(i) number of heads in two tosses of a coin.

(ii) number of tails in the simultaneous tosses of three coins.

(iii) number of heads in four tosses of a coin.

X	0	1	2	3	4
P(X)	$\frac{1}{16}$	$\frac{4}{16}$	$\frac{6}{16}$	$\frac{4}{16}$	$\frac{1}{16}$

**solution:**

(i) number of heads in two tosses of a coin.

Given, number of trials =  $n = 2$

probability of getting head for one coin =  $p = \frac{1}{2}$

probability of not getting a head =  $q = 1 - p = \frac{1}{2}$

let X represent the number of heads in two tosses of a coin

$\therefore$  the values of  $X = \{0, 1, 2\}$

by using binomial distribution

$$P(X) = {}^nC_X p^X q^{n-X}$$

Thus, the required probability distribution is

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

(ii) number of tails in the simultaneous tosses of three coins.

Given, number of trials =  $n = 3$

probability of getting tail for one coin =  $p = \frac{1}{2}$

probability of not getting tail =  $q = 1 - p = \frac{1}{2}$

let X represents the number of tails in simultaneous tosses of

three coins  $\therefore$  the values of  $X = \{0, 1, 2, 3\}$

by using binomial distribution

$$P(X) = {}^nC_X p^X q^{n-X}$$

Thus, the required probability distribution is

X	0	1	2	3
P(X)	$\frac{1}{8}$	$\frac{3}{8}$	$\frac{3}{8}$	$\frac{1}{8}$

(iii) number of heads in four tosses of a coin.

given, number of trials  $n = 4$

probability of getting a head for one coin =  $p = \frac{1}{2}$

probability of not getting a head =  $q = 1 - p = \frac{1}{2}$

let X represents the number of tails in simultaneous tosses of

three coins  $\therefore$  the values of  $X = \{0, 1, 2, 3, 4\}$