

# AI1103-Assignment 1

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Download all python codes from

[https://github.com/cs20btech11007/assignment1/  
blob/main/assignment1/assignment1.py](https://github.com/cs20btech11007/assignment1/blob/main/assignment1/assignment1.py)

and latex-tikz codes from

[https://github.com/cs20btech11007/assignment1/  
blob/main/assignment1/assignment1.tex](https://github.com/cs20btech11007/assignment1/blob/main/assignment1/assignment1.tex)

*To find the probability of getting tails in 2 throws of a single coin:*

$$\Pr(X = 0) = {}^2C_0 \times \left(\frac{1}{4}\right)^0 \times \left(\frac{3}{4}\right)^2 = \frac{9}{16} \quad (0.0.2)$$

$$\Pr(X = 1) = {}^2C_1 \times \left(\frac{1}{4}\right)^1 \times \left(\frac{3}{4}\right)^1 = \frac{6}{16} \quad (0.0.3)$$

$$\Pr(X = 2) = {}^2C_2 \times \left(\frac{1}{4}\right)^2 \times \left(\frac{3}{4}\right)^0 = \frac{1}{16} \quad (0.0.4)$$

$$(0.0.5)$$

## PROBLEM 1.12

A coin is biased so that the head is 3 times as likely to occur as tail. If the coin is tossed twice, find the probability distribution of number of tails.

*sol.*

let  $X$  be random variable  $X \in \{0, 1, 2\}$  denotes outcomes of tail in a experiment.

using binomial distribution and now finding probability distribution of number of tails in the events.

$$\Pr(X = k) = {}^nC_k p^k (1 - p)^{n-k} \quad (0.0.1)$$

Here,

Symbol	Meaning
k	no. of tails in two throws of a coin
n	no. of throws = 2
p	Pr of getting tail in single throw = $\frac{1}{4}$

TABLE 0: This table gives the meaning of each symbol used in the formula