

Assignment 1

Amaan - EP20BTECH11003

Download all python codes from

<https://github.com/RaghavJuyal/AI1103/blob/main/Assignment1/Codes/Assignment1.py>

and latex-tikz codes from

<https://github.com/RaghavJuyal/AI1103/tree/main/Assignment1/Assignment1.tex>

other than a doublet on the pair of dice,

$$q = \frac{5}{6} \quad (0.0.4)$$

Putting the above information in the equation (0.0.1), we get,

$$Pr(X = 0) = \frac{125}{216} \quad (0.0.5)$$

$$Pr(X = 1) = \frac{25}{72} \quad (0.0.6)$$

$$Pr(X = 2) = \frac{5}{72} \quad (0.0.7)$$

$$Pr(X = 3) = \frac{1}{216} \quad (0.0.8)$$

QUESTION 5.27

Find the probability distribution of number of doublets in three throws of a pair of dice?

SOLUTION

Let $X \in \{0, 1, 2, 3\}$ denote a random variable whose value represents the number of doublets obtained in 3 throws of a pair of dice. We can describe the whole experiment using Binomial probability distribution, given by,

$$Pr(X = r) = {}^nC_r p^r q^{n-r} \quad (0.0.1)$$

where, r is the number of successes, n is the total number of trials and p and q are the probabilities of success and failure respectively, such that,

$$p + q = 1 \quad (0.0.2)$$

Given, number of throws(trials), $n=3$,

And, we can find probability of obtaining a doublet on the pair of dice,

$$p = \frac{1}{6} \quad (0.0.3)$$

Probability of failure, i.e., obtaining any combination

$X=r$	0	1	2	3
$Pr(X=r)$	$\frac{125}{216}$	$\frac{25}{72}$	$\frac{5}{72}$	$\frac{1}{216}$