

Assignment

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AI21MTECH02003

I. GATE EC 8

Problem: Consider a dice with the property that the probability of a face with n dots showing up is proportional to n . The probability of the face with three dots showing up is ?

Solution: Given that the dice with the property that the probability of a face with n dots showing up is proportional to n , let the proportionality constant be ' c '.

$\Pr(N)$ is proportional to n where $n = \{1, 2, 3, 4, 5, 6\}$ is random variable.

Then $\Pr(n) = n \times c$, tabulating the outcomes :

n	1	2	3	4	5	6
$\Pr(N = n) = n \times c$	$1c$	$2c$	$3c$	$4c$	$5c$	$6c$

As the sum of all probability is equal to 1

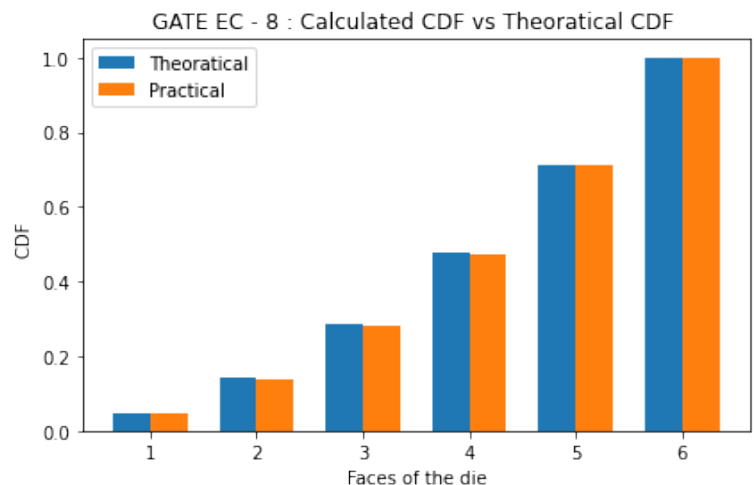
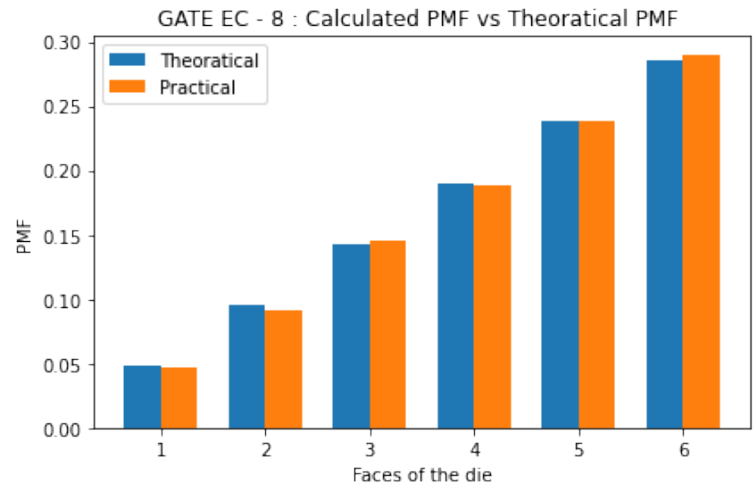
$$\begin{aligned}\sum_{N=n} \Pr(N) &= 1 \\ c + 2c + 3c + 4c + 5c + 6c &= 1 \\ 21c &= 1 \\ c &= \frac{1}{21}\end{aligned}$$

The probability of three dots showing up is $3c$

Giving the probability to be:

$$\begin{aligned}\Pr(N = 3) &= 3 \times c \\ &= 3 \times \frac{1}{21} \\ &= \frac{3}{21} \\ &= \frac{1}{7} \\ &= 0.1428\end{aligned}$$

The probability of getting a face with three dots showing up is 0.1428



Code source: https://github.com/harshal9876/AI5002/blob/main/Assignment_9/Codes/Assignment_9.py
LaTeX code : https://github.com/harshal9876/AI5002/blob/main/Assignment_9/Assignment_9.tex