Assignment 4

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Outline

Question

A fair die is rolled five times.We shall find $p_5(2)$ *that "six" will show twice*

Answer

(a)In a single roll of die,
A=six is an event with probability 1/6
then

$$p = \frac{1}{6} \tag{1}$$

$$q = 1 - p \tag{2}$$

$$q = 1 - \frac{1}{6} \tag{3}$$

$$q = \frac{5}{6} \tag{4}$$

$$n = 5; k = 2 \tag{5}$$

$$\tag{6}$$

$$As\ p_n(k) = {}^nC_k \cdot (q)^{n-k} \cdot (p)^k \tag{7}$$

$$p_5(2) = {}^5C_2 \cdot (\frac{5}{6})^3 \cdot (\frac{1}{6})^2 \tag{8}$$

Hence the probability of getting six twice in 5 rolls is (9)

$$p_5(2) = \frac{625}{3888} \tag{10}$$

$$= 0.16075102880658423 \tag{11}$$

Code Output:

The following is a result of python code plotting pmf of given cases

```
avinashnayak@AVINASHs-MacBook-Air AI1103 % /usr/local/bin/python3 /Users/avinashnayak/Desktop/AI1103/main.p
Hence the probability of getting six twice in 5 rolls is 0.16075102880658423
avinashnayak@AVINASHs-MacBook-Air AI1103 %
```