Assignment 3

Kummitha Jhanavi CS21BTECH11032

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Outline

Problem Statement

Ex 13.4 Question 11

Two dice are thrown simultaneously. If X denotes the number of sixes, find the expectation of X.

definition

X

=0 means six occurs zero times.

X =1 means six occurs one time.

X =2 means six occurs two time.

Solution

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wo dice are thrown simultaneously. If X denotes the number of sixes, find the expectation of X.

$$Let S = 1, 2, 3, 4, 5, 6, n(S) = 6 \tag{1}$$

Let A denotes the number 6

$$\text{A} = 6,\ \text{n(A)} = 1,\ \text{P(A)} = \frac{n(A)}{n(S)} = \frac{1}{6}$$

$$\text{P}(\overline{A}) = 1 - \frac{1}{6} = \frac{5}{6}$$

$$\text{Now n} = 2\ ,\ \text{r=0,1,2,}\ \text{P(X=0)} \implies \text{P}(\overline{A})P(\overline{A}) = \frac{25}{36}$$
$$\text{P}(\text{X} = 1) = 2\text{P(A)P}(\overline{A}) = 2 * \frac{1}{6} * \frac{5}{6} = \frac{10}{36}$$
$$\text{P}(\text{X} = 2) = \text{P(A)P}(\overline{A}) = \frac{1}{6} * \frac{1}{6} = \frac{1}{36}$$
$$\text{E(X)} = 0\text{*P}(\overline{A})P(\overline{A}) + 1 * P(X = 1) + 2 * P(X = 2) = \frac{12}{36} = \frac{1}{3}$$