

# Assignment 3

Kummitha Jhanavi CS21BTECH11032

May 17, 2022

# Outline

1 Problem Statement

2 Solution

# Problem Statement

## Ex 13.4 Question 11

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

# Solution

T

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

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

Let  $A$  denotes the number 6

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

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

$$\text{Now } n = 2, r=0,1,2, P(X=0) \implies P(\bar{A})P(\bar{A}) = \frac{25}{36}$$

$$P(X = 1) = 2P(A)P(\bar{A}) = 2 * \frac{1}{6} * \frac{5}{6} = \frac{10}{36}$$

$$P(X = 2) = P(A)P(A) = \frac{1}{6} * \frac{1}{6} = \frac{1}{36}$$

$$E(X) = 0 * P(\bar{A})P(\bar{A}) + 1 * P(X = 1) + 2 * P(X = 2) = \frac{12}{36} = \frac{1}{3}$$