# Assignment 1

## AI1110: Probability and Random Variables

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## ICSE 2014 Grade 10

**Problem Statement**

Question 1.C of ICSE maths 2014 paper

**question:** A die has 6 faces marked by given numbers as shown below

| 1 | 2 | 3 | -1 | -2 | -3 |
|---|---|---|---|---|---|

The die is thrown once. What is the probability of getting:
(i) a positive integer
(ii) an integer greater than -3
(iii) the smallest integer

**Solution:**

Let S be the sample space.

$$S = \{1, 2, 3, -1, -2, -3\} \tag{1}$$
$$n(S) = 6 \tag{2}$$

(i) Let $E_1$ be the event of getting positive integer.

$$E_1 = \{1, 2, 3\} \tag{3}$$
$$\implies n(E_1) = 3 \tag{4}$$

Let $P(E_1)$ be the probability of getting a positive integer

$$P(E_1) = \frac{n(E_1)}{n(S)} \tag{5}$$
$$\implies P(E_1) = \frac{3}{6} \tag{6}$$
$$= \frac{1}{2} \tag{7}$$
$$= 0.5 \tag{8}$$

(ii) Let $E_2$ be the event of getting an integer greater than -3.

$$E_2 = \{1, 2, 3, -1, -2\} \tag{9}$$
$$\implies n(E_2) = 5 \tag{10}$$

Let $P(E_2)$ be the probability of getting an integer greater than -3

$$P(E_2) = \frac{n(E_2)}{n(S)} \tag{11}$$
$$\implies P(E_1) = \frac{5}{6} \tag{12}$$
$$= 0.833 \tag{13}$$

(iii) Let $E_3$ be the event of getting the smallest integer.

$$E_3 = \{-3\} \tag{14}$$
$$\implies n(E_3) = 1 \tag{15}$$

Let $P(E_3)$ be the probability of getting the smallest integer

$$P(E_3) = \frac{n(E_3)}{n(S)} \tag{16}$$
$$\implies P(E_1) = \frac{1}{6} \tag{17}$$
$$= 0.166 \tag{18}$$