Assignment 5

Perambuduri Srikaran - AI20BTECH11018

Download all python codes from

https://github.com/srikaran-p/AI1103/tree/main/Assignment5/codes

and latex codes from

https://github.com/srikaran-p/AI1103/tree/main/Assignment5

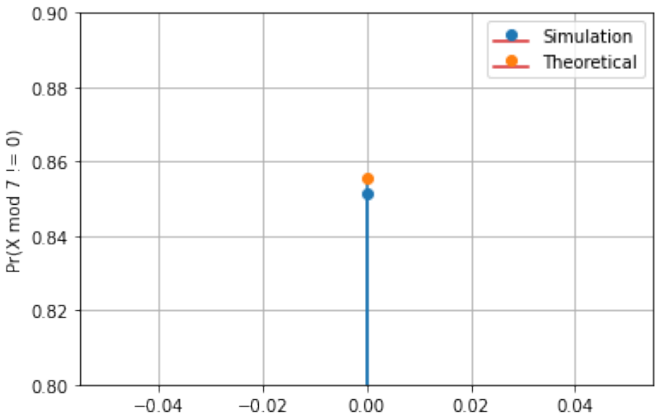

Fig. 4: Plot for Simulation v/s Theoretical

Problem

(GATE-CS 2013 Q62) Out of all the 2-digit integers between 1 and 100, a 2-digit number has to be selected at random. What is the probability that the selected number is not divisible by 7?

(A) $\frac{13}{90}$

(B) $\frac{12}{90}$

(C) $\frac{78}{90}$

(D) $\frac{77}{90}$

Solution

Let $X = \{10, 11, \ldots, 99\}$ be a random variable. Here, $\lfloor x \rfloor$ rounds off x to the greatest integer less than x.

$$\Pr\left(X \bmod 7 \neq 0\right) = 1 - \frac{n(X \bmod 7 = 0)}{n(X)} \tag{0.0.1}$$

$$\Pr\left(X \bmod 7 \neq 0\right) = 1 - \frac{\left\lfloor \frac{100}{7} \right\rfloor - \left\lfloor \frac{10}{7} \right\rfloor}{90} \tag{0.0.2}$$

$$\Pr\left(X \bmod 7 \neq 0\right) = 1 - \frac{13}{90} \tag{0.0.3}$$

$$\Pr\left(X \bmod 7 \neq 0\right) = \frac{77}{90} \tag{0.0.4}$$

So, the correct option is (D).