# Assignment 3

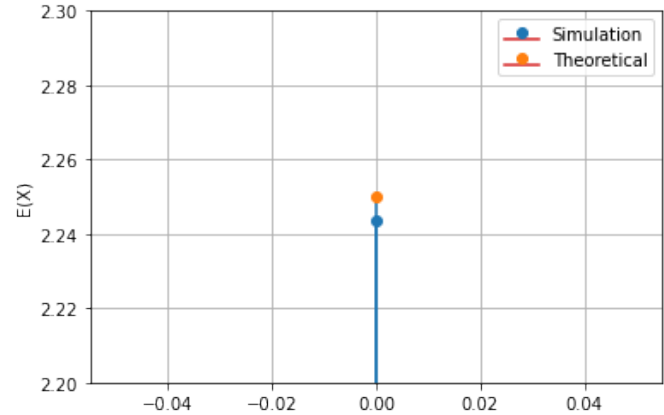## Perambuduri Srikaran - AI20BTECH11018

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Fig. 0: Plot for Simulation v/s Theoretical

### PROBLEM

(GATE-MA 2015 Q17) Let $X$ be a random variable having the distribution function

$$F(x) = \begin{cases} 0 & \text{if } x < 0 \\ \frac{1}{4} & \text{if } 0 \leq x < 1 \\ \frac{1}{3} & \text{if } 1 \leq x < 2 \\ \frac{1}{2} & \text{if } 2 \leq x < \frac{11}{3} \\ 1 & \text{if } x \geq \frac{11}{3} \end{cases} \quad (0.0.1)$$

Then $E(X)$ is equal to ...

### SOLUTION

The PDF for the above CDF is

$$P(x) = \begin{cases} \frac{1}{4} & \text{if } x = 0 \\ \frac{1}{12} & \text{if } x = 1 \\ \frac{1}{6} & \text{if } x = 2 \\ \frac{1}{2} & \text{if } x = \frac{11}{3} \\ 0 & \text{if otherwise} \end{cases} \quad (0.0.2)$$

$$E(X) = 0\left(\frac{1}{4}\right) + 1\left(\frac{1}{12}\right) + 2\left(\frac{1}{6}\right) + \left(\frac{11}{3}\right)\left(\frac{1}{2}\right) \quad (0.0.3)$$

$$E(X) = 2.25 \quad (0.0.4)$$