AI1103-Assignment 3

Name: Ramanathan Annamalai
Roll Number: BM20BTECH11011

Download all python codes from

https://github.com/Ramanathan−Annamalai/AI1103−Probability_and_Random_Variables/tree/main/Assignment%203/Codes

and latex-tikz codes from

https://github.com/Ramanathan−Annamalai/AI1103−Probability_and_Random_Variables/blob/main/Assignment%203/Assignment_3.tex

Question

Let X be a continuous random variable denoting the temperature measured. The range of temperature is [0,100] degree Celsius and let probability density function of X be $f(x)$=0.01 for $0 \leq X \leq 100$.

The mean of X is ?

(A) 2.5
(B) 5.0
(C) 25.0
(D) 50.0

Solution

Given X is a continuous random variable in range [0,100].

The probability distribution function function is $f(x)$

$$f(x) = 0.01 \;\forall\; X \in [0, 100] \tag{0.0.1}$$

Mean of the probability distribution function is μ.

$$\mu = \int X\, f(x)\, \mathrm{d}x \tag{0.0.2}$$

$$= \int_0^{100} X\,(0.01)\, \mathrm{d}x \tag{0.0.3}$$

$$= (0.01) \int_0^{100} X\, \mathrm{d}x \tag{0.0.4}$$

$$= (0.01)\, \frac{X^2}{2}\Big|_0^{100} \tag{0.0.5}$$

$$= 50.0 \tag{0.0.6}$$

Answer: **Option (D)**