

# AI1103-Assignment 3

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Download all python codes from

[https://github.com/Ramanathan-Annamalai/AI1103-Probability\\_and\\_Random\\_Variables/tree/main/Assignment%203/Codes](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](https://github.com/Ramanathan-Annamalai/AI1103-Probability_and_Random_Variables/blob/main/Assignment%203/Assignment_3.tex)

Mean of the random variable  $X$  is  $\mu$

$$\mu = \int_{-\infty}^{\infty} x f(x) dx \quad (0.0.2)$$

$$= \int_0^{100} x (0.01) dx \quad (0.0.3)$$

$$= (0.01) \int_0^{100} x dx \quad (0.0.4)$$

$$= (0.01) \left. \frac{x^2}{2} \right|_0^{100} \quad (0.0.5)$$

$$= 50.0 \text{ degree Celsius} \quad (0.0.6)$$

## 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

Answer: **Option (D)**

## SOLUTION

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

The probability density function of  $X$  is  $f(x)$

$$f(x) = \begin{cases} 0.01 & x \in [0, 100] \\ 0 & \text{otherwise} \end{cases} \quad (0.0.1)$$