

# AI1103 Assignment 2

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Download all python codes from

[https://github.com/Sandeep-L/AI1103\\_2/blob/main/Assignment\\_2\\_AI1103.py](https://github.com/Sandeep-L/AI1103_2/blob/main/Assignment_2_AI1103.py)

and latex-tikz codes from

[https://github.com/Sandeep-L/AI1103\\_2/blob/main/Assignment\\_2\\_AI1103.tex](https://github.com/Sandeep-L/AI1103_2/blob/main/Assignment_2_AI1103.tex)

The probability of getting a number in  $\left[0, \frac{1}{2}\right)$ , i.e,  $x = \frac{1}{2}^-$  is

$$F_X\left(\frac{1}{2}^-\right) = \frac{1}{2} \quad (0.0.3)$$

$$F_X\left(\frac{1}{2}\right) = \frac{1}{4} \quad (0.0.4)$$

The probability of getting a number in  $\left[0, \frac{1}{2}\right]$ , i.e,  $x = \frac{1}{2}$  is

$$F_X\left(\frac{1}{2}\right) = \frac{1}{2} \quad (0.0.5)$$

## 72 QUESTION

Let  $\Omega = (0, 1]$  be the sample space and let  $P(\cdot)$  be a probability function defined by

$$P((0, x]) = \begin{cases} \frac{x}{2} & 0 \leq x < \frac{1}{2} \\ x & \frac{1}{2} \leq x \leq 1 \end{cases} \quad (0.0.1)$$

Then  $\Pr\left(\left\{\frac{1}{2}\right\}\right)$  is equal to.....

## SOLUTION

Let  $X$  be a random variable and the CDF  $F_X(x)$  be defined as

$$F_X(x) = \begin{cases} \frac{x}{2} & 0 \leq x < \frac{1}{2} \\ x & \frac{1}{2} \leq x \leq 1 \end{cases} \quad (0.0.2)$$

Therefore, the probability of getting  $\left\{\frac{1}{2}\right\}$  is

$$\Pr\left(X = \frac{1}{2}\right) = F_X\left(\frac{1}{2}\right) - F_X\left(\frac{1}{2}^-\right) \quad (0.0.6)$$

$$\Pr\left(X = \frac{1}{2}\right) = \frac{1}{2} - \frac{1}{4} \quad (0.0.7)$$

$$\Pr\left(X = \frac{1}{2}\right) = \frac{1}{4} \quad (0.0.8)$$

