

Assignment 10

Parvez Alam : AI21RESCH01005

March 2021

Git Hub Link : <https://github.com/ParvezAlam123/Assignment-10>

1 Gate 21 :

Consider two identically distributed zero mean random variables U and V . Let the cumulative distribution function of U and $2V$ be $F(x)$ and $G(x)$ respectively. Then for all value of x

- (a) $F(x)-G(x) \leq 0$ (b) $(F(x)-G(x)) \leq 0$
(c) $F(x)-G(x) \geq 0$ (d) $(F(x)-G(x))x \geq 0$

Solution:

Let X be a random variable having zero mean. X, U, V have the same distribution.

Since U and V are identically distributed. So

$$\begin{aligned} F(x) &= P(X \leq x) \\ G(x) &= P(2X \leq x) \\ &= P(X \leq x/2) \\ &= F(x) - P(X > x/2) \end{aligned}$$

1. if $X > 0$ then

$$F(x) - G(x) > 0$$

2. if $X < 0$ then

$$\begin{aligned} F(x) - G(x) &< 0 \\ \Rightarrow (F(x) - G(x))x &\geq 0 \end{aligned}$$

