Assignment 10

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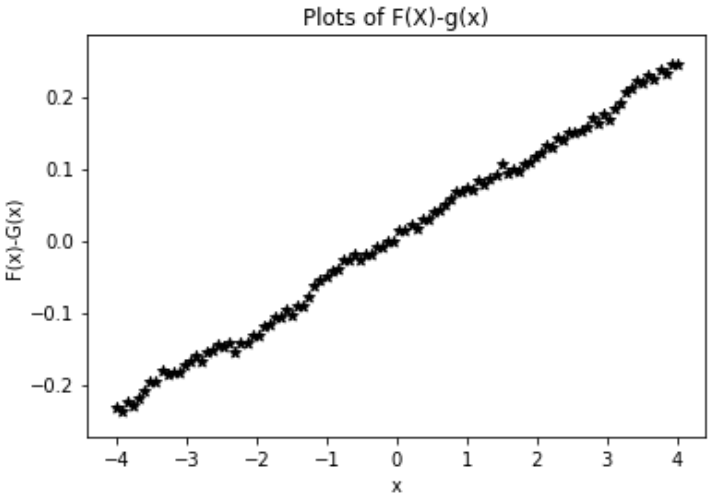
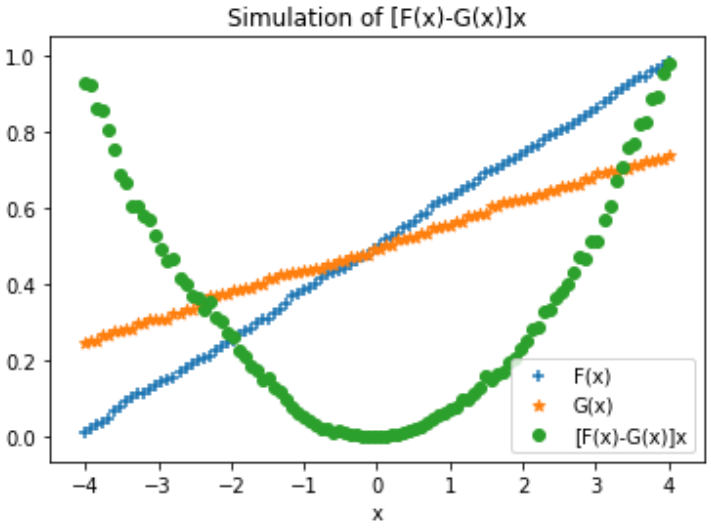
March 2021

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)≤0 (b) (F(x)-G(x))≤0
(c) F(x)-G(x)≥0 (d) (F(x)-G(x))x≥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

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

1. if X > 0 then

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

2. if X < 0 then

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