AI5002 - Assignment 1

Tuhin Dutta

ai21mtech02002

Download code and LaTeX from below hyperlinks
1. Code
2. LaTeX

Problem

6.1.3 Plot the CDF and PDf of

$$A = \sqrt{V}$$

Solution

We can write A = $\sqrt{V}$ *as*

A = $\sqrt{X_1^2 + X_2^2}$

since it is given $X_1 \sim N(0, 1)$, $X_2 \sim N(0, 1)$ *and* V = $X_1^2 + X_2^2$.

Since joint distribution is not mentioned so we assume X_1 *and* X_2 to be independent otherwise the distribution of A would be unknown.

By definition, the distribution of A is Chi with two degrees of freedom or Rayleigh.

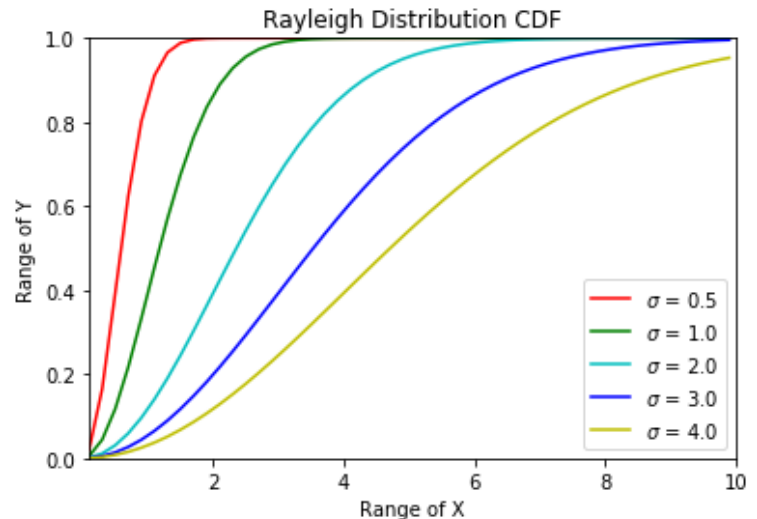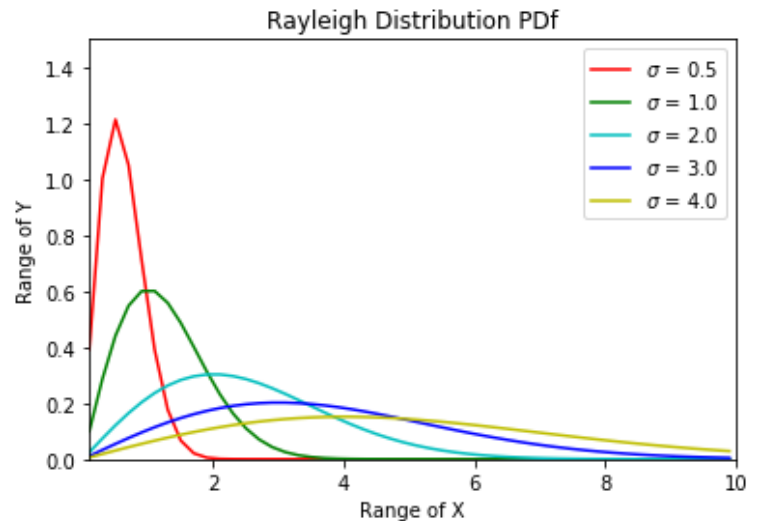The CDF and PDF plot is as shown -

Fig 1.1: Cumulative distribution function

Fig 1.2: Probability distribution function