Indian Institute of Space Science and Technology – Thiruvananthapuram

Assignment-III

1. Plot normal distribution with mean 0 and standard deviation 1.

2. Plot $\exp(x), \exp(-x), logx(x > 0)$ in the same figure by giving different shades to each plot.

3. (a) Generate 500 samples from Bernoulli distribution having probability of success $\phi = 0.25$. Plot the probability mass function using the selected data.
   (b) Generate 2000 samples from Normal distribution having mean 100 and standard deviation 5. Plot the histogram and probability density function in the same figure using the selected data.

4. (a) Generate 200 data points that satisfy the equation $3x + 4y - 3 = 0$. Plot the hyperplane and mark the selected points.
   (b) Generate 1000 data points that satisfy the equation $5x - 2y - 6z = 0$. Plot the hyperplane and mark the selected points.

5. Write a function module for the following tasks: (a) To determine the probability mass function of Bernoulli and Binomial distribution. (b) To determine the probability density function of Normal distribution.

6. Draw a figure that consists of the following subfigures: (a) Circle 1: $x^2 + y^2 = 3$ (b) Circle 2: $x^2 + y^2 = 2$ (c) Red colour between Circle 1 and Circle 2 (d) Green colour inside Circle 2.

7. Draw a figure that consists of the following subfigures: (a) Line 1: $6x - 9y + 2 = 0$ (b) Line 2: $6x-9y+2 = 1$ (c) Line 3: $6x-9y+2 = -1$ (d) A segment that connects $6x - 9y + 2 = 1$ and $6x - 9y + 2 = -1$. (e) Blue colour above $6x - 9y + 2 = 1$ and yellow colour below $6x - 9y + 2 = -1$.