MATH2561: Probability and Statistics

Instructor: **Dr. Harsha K V**, Department of Mathematics

GITAM Hyderabad

Unit 5: Practice Questions

QUESTIONS

1)
- Find the two regression lines ($y = a + bx$, and $x = c + dy$) for the following data. What is the estimated value for Y when $X = 73$, and also find the estimated value of X when $Y = 66$

X	65	66	67	67	68	69	70	72
Y	67	68	65	68	72	72	69	71

- For the above data, find the Pearson correlation coefficient r, and rank correlation ρ?
- Use the scatter plot to visualize the data?

2) Can $Y = 5 + 2.8X$ and $X = 3 - 0.5Y$ be the regression lines of Y on X and X on Y respectively?

3) It is given that for a data set (X, Y), we have Var$(X) = 9$ and the two regression lines are

$$8X - 10Y + 66 = 0 \tag{1}$$

$$40X - 18Y - 214 = 0 \tag{2}$$

Then answer the following:

- What are the means of X and Y?
- Calculate the correlation coefficient between X, Y?
- Find the standard deviation of Y?

4) Fit a linear curve of the type $y = a + bx$ for the following data:

X	2	4	6	8	10	12
Y	18	15	14	11	11	9

5) Fit an exponential curve of the type $y = ab^x$ for the following data:

X	2	3	4	5	6
Y	144	172.8	207.4	248.8	298.6

6) Fit a second-degree polynomial of the type $y = a + bx + cx^2$ for the following data:

X	0	1	2	3	4
Y	1	5	10	22	38

7) Fit an exponential curve of the type $y = ae^{bx}$ for the following data:

X	1	2	3	4	5	6	7	8
Y	19	22	23	25	26	28	17	20