

Reading 3 Common Univariate Random Variables

Task 1: Solve probability for the events given using the data below. (Binomial)

Reserve bank of India is hiring officers for their risk management team. As per the requirement, Masters degree is compulsory and FRM is desired qualification. Hiring team received 20 resumes for job application out of which 5 are certified FRM's. Hiring is for 10 officers.

- A: Probability of getting 4 FRMs in the hiring of 10.
- B: Probability of getting less than two FRM's in hiring of 10.
- C: Probability of getting no FRM's in the hiring.
- D: Probability of all FRM applicants getting selected in hiring.
- E: Probability of at least 2 FRM's getting hired.
- F: Expected number of FRM's getting hired
- G: Variance of FRM's getting selected.

Task 2: Solve probability for the events given using the data below. (Poisson)

A startup is trying to solve logistics problem and need your help. 20 courier packages can be delivered in 3 days time period. For every package delivered in time it pays \$5 to courier staff. And startup incurs cost of \$10 for the late delivery of the package in the form of discount offered to customers. Based on this information answer following questions.

- A: What is the probability of delivering 10 packages in 3 days' time period.?
- B: What is the probability of delivering 5 packages in a day?
- C: what is the probability of delivering 30 packages in 5 days?
- D: What is the probability of delivering 30 packages in 3 days?
- E: What is the expected cost incurred by the firm if 20 packages are in dispatch?

F: Probability of 1 or 2 packages delivered within a day.

Task 3: Solve the questions on Normal Distribution.

On an average 200 customers default on the loan in a town within year with standard deviation of 15. Bank manager of Town bank wants some answers from you-

A: What is the probability of more than 230 customers will default within year.

B: Probability of maximum 250 customers defaulting within year in a bank.

C: Probability of 150 to 250 customers defaulting in a bank.

D: How many customers at minimum should default with probability of 10%.

E: How many customers at minimum should default with probability of 75%.

Task 4 : Fill the blanks assuming normal distribution.

The _____ % confidence interval for X is within ± 1 SD.

The _____% confidence interval for X is within ± 2 SD

The _____% confidence interval for X is within ± 1.65 SD

The _____% confidence interval for X is within ± 1.96 SD

The _____% confidence interval for X is within ± 2.58 SD.

Task 5: Take 5 random Z values and find out probabilities from the Z table (Table type left tail infinity to right and Center to right infinity both).

Task 6: Write down the conditions in which Students t distribution can be used and the properties of students t distribution.