



## **AI and Data Science Department**

Subject: SAIDS

Class Assignment No : 2

Submission date: 11/8/2023

Q1) The average number of acres burned by forest and range fires in a large New Mexico county is 4300 acres per year, with a standard deviation of 750 acres. The distribution of the number of acres burned is normal. What is probability the between 2500 and 4200 acres will be burned in any given year? What number of burnt acres corresponds to the 38<sup>th</sup> percentile?

Q2) You want to rent an unfurnished one-bedroom apartment in Durham, NC next year. The mean monthly rent for a random sample of 60 apartments advertised on Craig's List (a website that lists apartments for rent) is \$1000. Assume a population standard deviation of \$200. Construct a 95% confidence interval.

Q3) Let  $X$  = amount of time a shopkeeper spends with his customer follows exponential distribution with the average amount of time equal to 4 minutes. Find the probability that the shopkeeper is going to spend 5 minutes with the customer?

Q4) Some vehicles pass through a junction on a busy road at an average rate of 300 per hour.

- Find out the probability that none passes in a given minute.
- What is the expected number of passing in two minutes?
- Find the probability that this expected number found above actually pass through in a given two-minute period.

### **Theory questions**

1. Discuss Boot strapping vs. re-sampling.
2. Discuss Confidence Interval