# Department of Mathematics
# MTH 372 (Statistical Inference)
# Assignment Sheet

Instructions

- Use statistical software R for your codes and only basic in-built functions are allowed.
- The due date is April 20, 2024 (11.59 p.m.). No late assignments will be accepted.
- Submit all of your work which include the report, codes, results and graphs.
- Provide detailed explanations in the reports to obtain full marks.
- Follow the given labelling method for your files (rollnumber-name).
- If not mentioned, then use $\alpha = 0.05$, assume the sample is a simple random sample and the sample comes from a normally distributed population.
- Plagiarism in the codes will lead to zero marks in the assignment.
- The data is given in attached (csv) file.

1. Find the distribution that best fits the data. (3 marks)
2. List at least two estimators of the parameter(s) involved in the underlying distribution. (2 marks)
3. a. Classify the estimators in (1) into the unbiased, consistent or efficient estimators. (1 marks)
   b. Find the estimates from the data. (1 marks)
4. Find two parameters of the distribution using Method of Moments. (2 marks)
5. Find the Uniformly Minimum Variance Unbiased Estimator (UMVUE) of the parameter's and find its estimate from the data. (2 marks)
6. Find the interval estimator of any one parameter of the population distribution with confidence $\alpha = 0.01$; 0.05; 0.1. (3 marks)
7. Test the hypothesis that the mean $\mu$ is equal to $\mu_0$ (Take any value which is nearer to the mean of data). (2 mark)
8. Test the hypothesis that the variance $\sigma^2$ is equal $\sigma_0^2$ (Take any value which is nearer to the variance of data). (2 mark)
9. Perform goodness of fit to test the hypothesis that the distribution of the collected data is same as the distribution you fitted in Qustion 1. (2 marks)