Subject: 21DS602/21CS644

Lab Session Date: 11-10-2021

Notes:

1. Report Assignment and codes should be submitted in Teams Assignment to be created by 11:59 PM October 15,2021. Closing date is 11:59 PM on October 16, 2021.
2. The report may be provided in DOC(X) or PDF format.

A1. Please refer to the "***Purchase Data***" worksheet of ***Lab Session1 Data.xlsx***. Please load the data and segregate them into 2 matrices A & C (following the nomenclature of AX = C). Do the following activities.

- What is the dimensionality of the vector space for this data?
- How many vectors exist in this vector space?
- What is the rank of Matrix A?
- Using Pseudo-Inverse find the cost of each product available for sale.
  (Suggestion: If you use Python, you can use ***`numpy.linalg.pinv()`*** *function to get a pseudo-inverse.)*

A2. Please refer to the data present in "***IRCTC Stock Price***" data sheet of the above excel file. Do the following after loading the data to your programming platform.

- Calculate the mean and variance of the Price data present in column D.
  (Suggestion: if you use Python, you may use ***`statistics.mean()`*** *&* ***`statistics.variance()`*** *methods).*

- Select the price data for all Wednesdays and calculate the sample mean. Compare the mean with the population mean and note your observations.
- Select the price data for the month of Apr and calculate the sample mean. Compare the mean with the population mean and note your observations.
- From the Chg% (available in column I) find the probability of making a loss over the stock.
  (Suggestion: use lambda function to find negative values)
- Calculate the probability of making a profit on Wednesday.
- Calculate the conditional probability of making profit, given that today is Wednesday.
- Make a scatter plot of Chg% data against the day of the week

Report Assignment:

Q1. Observing the stock data provided, record your suggestions to build a system that may be able to predict the price and Change % into future.