# Assignment 3

**Deadline: 6 October,2022**

You have to read the stock data for the list of companies using the api (quandl).

Detailed documentation: [https://github.com/quandl/quandl-python](https://github.com/quandl/quandl-python)

List of companies=[HBL,ABL, UBL, BOP]

API key: k5hpQXTQmkr3f2cBYTDb

Your data must be from 1-1-2011 to 30-7-2021

**Dataset sample:**

| Date | Open | High | Low | Turnover | Close |
|---|---|---|---|---|---|
| 1/3/2011 | 121.94 | 121 | 116.8 | 510969 | 121.94 |
| 1/4/2011 | 119.49 | 122.3 | 119.5 | 627959 | 119.49 |
| 1/5/2011 | 121.87 | 126.45 | 121.4 | 1506848 | 121.87 |
| 1/6/2011 | 124.93 | 125.89 | 123.75 | 773913 | 124.93 |
| 1/7/2011 | 124.98 | 126.06 | 124.69 | 376749 | 124.98 |
| 1/10/2011 | 124.99 | 126.8 | 123 | 166214 | 124.99 |
| 1/11/2011 | 123.56 | 124.5 | 122.75 | 329849 | 123.56 |
| 1/12/2011 | 123.01 | 128.9 | 123.89 | 788687 | 123.01 |
| 1/13/2011 | 127.87 | 128.97 | 126.25 | 156709 | 127.87 |
| 1/14/2011 | 127.6 | 128.48 | 126.45 | 278339 | 127.6 |
| 1/17/2011 | 126.7 | 128 | 126.34 | 195832 | 126.7 |

Answer the following questions from the dataset. You are only allowed to use NumPy, Pandas and Matplotlib. Do these for all listed companies using subplots.

- Visualize the total turnover of stock being traded each day for all companies using subplots.
- Visualize the daily price change in stock? Formula (open price – previous close price)
- Plot the monthly and yearly mean of close price.
- Plot the Daily Returns. Formula (previous close/close)-1
- What dates each bank stock had the best and worst single day returns. Just Display those dates.
- Which bank stock would you classify as the riskiest over the entire time period? (**standard deviation - indicates the risk**). Make the bar chart for it.
- Make a line plot showing the Close price for each bank for the entire time in a single graph
- Make another 3 interesting visualizations on this stock data and write down your findings in markdown.