MA374 Financial Engineering lab: 05

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Ques.1

- To execute my .py file
  Run **$python3 180123029_NamanGoyal_q1.py** on the terminal. The snapshot is given below

```
~/Desktop/FE_Labs/lab05   python3 180123029_NamanGoyal_q1.py
Expected return for NIFTY is: 0.1274085826169013
Variance for NIFTY is: 0.22001584461429835

Expected return for SENSEX is: 0.12437255087912862
Variance for SENSEX is: 0.21809497993913696

Considering 10 Stocks of BSE

The risk Free return = 0.05
The return on market portfolio is 1.0284
The risk on market portfolio is 1.8448 ( 184.4753 % )
Risk Free Rate: 0.05

Considering 10 Stocks of NSE

The risk Free return = 0.05
The return on market portfolio is 0.9892
The risk on market portfolio is 1.3088 ( 130.8808 % )
Risk Free Rate: 0.05

Considering 10 Stocks not included in BSE

The risk Free return = 0.05
The return on market portfolio is 0.9481
The risk on market portfolio is 1.4602 ( 146.0152 % )
Risk Free Rate: 0.05

Considering 10 Stocks not included in NSE

The risk Free return = 0.05
The return on market portfolio is 0.9481
The risk on market portfolio is 1.4602 ( 146.0152 % )
Risk Free Rate: 0.05
~/Desktop/FE_Labs/lab05   |
```
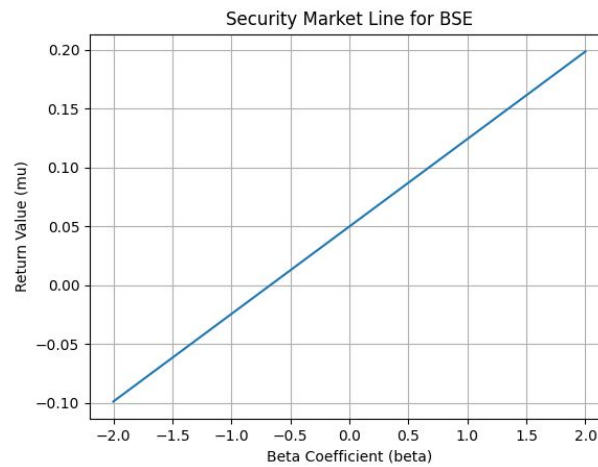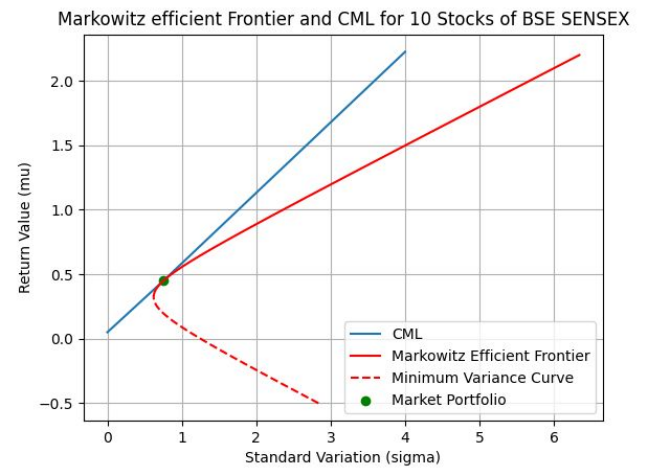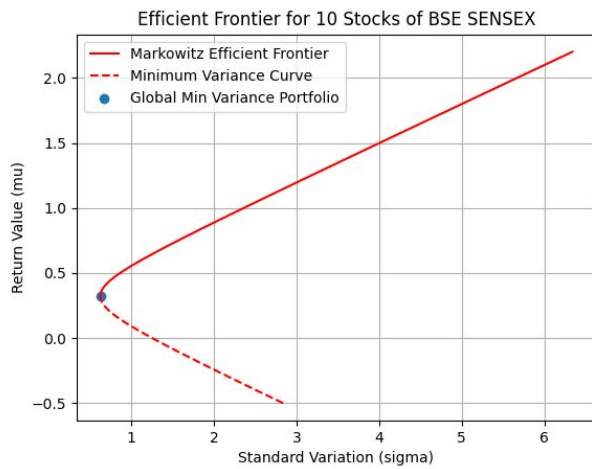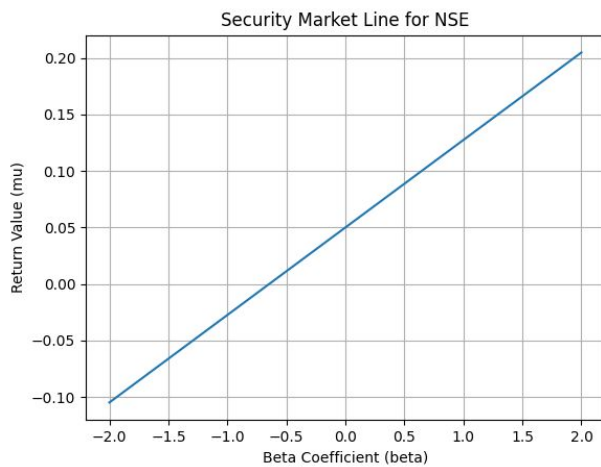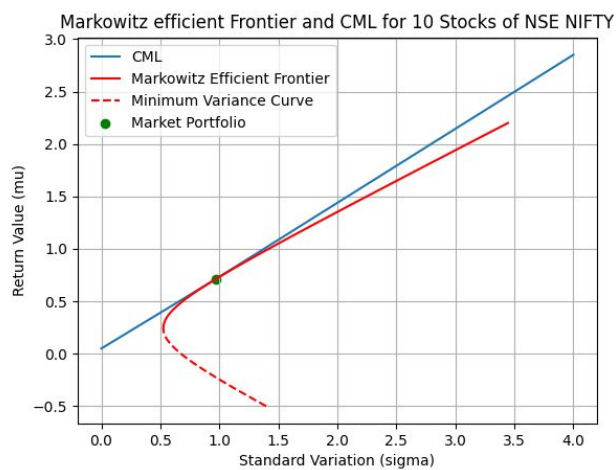
● Efficient Frontier for **BSE** with and without CML && Security Line:

Efficient Frontier for 10 Stocks of BSE SENSEX

Markowitz efficient Frontier and CML for 10 Stocks of BSE SENSEX

Security Market Line for BSE

● Efficient Frontier for **NSE** with and without CML && Security Line:
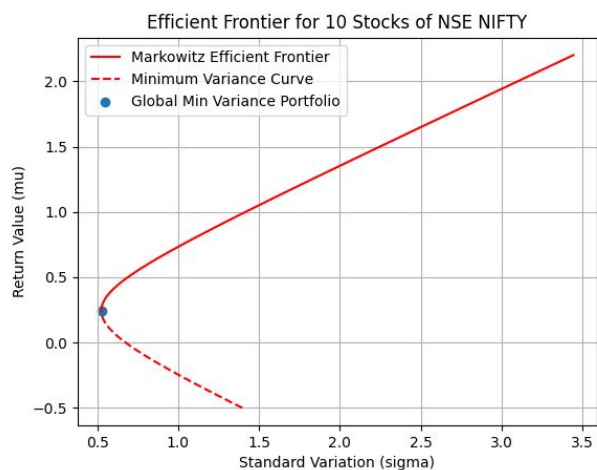
● Efficient Frontier for **Non-Indexed Stocks** with and without CML:
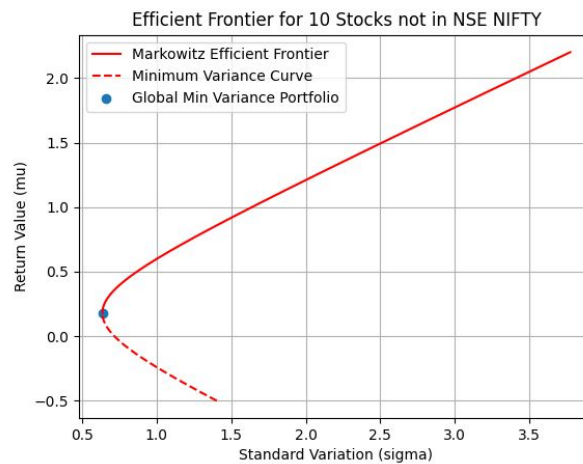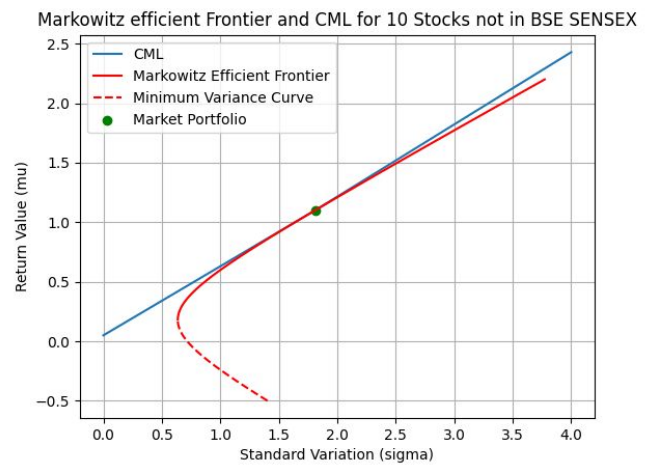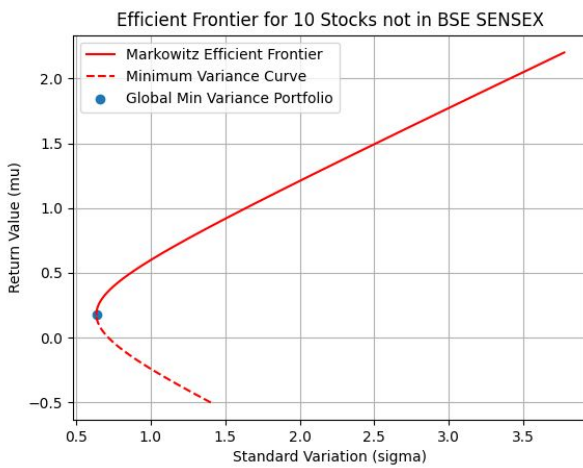
Ques.2
● To execute my .py file
Run **$python3 180123029_NamanGoyal_q2.py** on the terminal. The snapshot
is given below

```
~/Desktop/FF_Labs/lab05    python3 180123029_NamanGoyal_q2.py       ✓
Analysis of BSE stocks ---------->
Stock : Airtel
Stock overvalued
Stock : CoalIndia
Stock overvalued
Stock : LT
Stock undervalued
Stock : Asian Paints
Stock undervalued
Stock : SBI
Stock undervalued
Stock : Wipro
Stock undervalued
Stock : Reliance
Stock undervalued
Stock : AxisBank
Stock undervalued
Stock : TataMotors
Stock overvalued
Stock : TataSteel
Stock undervalued

Security Market Line
Chosen Market portfolio is : BSE
--------------------------------------------------------------------------
--------------------------------------------------------------------------
Analysis of NSE stocks ---------->
Stock : BHEL
Stock overvalued
Stock : BOB
Stock overvalued
Stock : Britannia
Stock undervalued
Stock : Colgate
Stock overvalued
Stock : Dabur
Stock undervalued
Stock : Godrej
Stock undervalued
Stock : Reliance
Stock undervalued
Stock : Asian Paints
Stock undervalued
Stock : Berger Paints
Stock undervalued
Stock : MuthootFin
Stock undervalued

Security Market Line
Chosen Market portfolio is : NSE
--------------------------------------------------------------------------
```

```
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Analysis of NON-INDEXED STOCKS stocks ---------->
Stock : AmbujaCem
Stock overvalued
Stock : AshokLey
Stock undervalued
Stock : Bhel
Stock overvalued
Stock : Sail
Stock undervalued
Stock : Havells
Stock undervalued
Stock : Sun Pharma
Stock overvalued
Stock : Travencore
Stock undervalued
Stock : DLF
Stock undervalued
Stock : Heidelcore Cement
Stock undervalued
Stock : MRF
Stock undervalued
```

- The Companies taken for **BSE (SENSEX) Exchange** are:
    - **BHARAT AIRTEL**
    - **COAL INDIA**
    - **Larsen & Toubro**
    - **ASIAN PAINTS**
    - **STATE BANK OF INDIA**
    - **WIPRO**
    - **RELIANCE**
    - **AXIS BANK**
    - **TATA MOTORS**
    - **TATA STEEL**
- The Companies taken for **NSE (NIFTY) Exchange** are:
    - **BHEL**
    - **BOB**
    - **BRITANNIA**
    - **COLGATE**
    - **DABUR**
    - **GODREJ**
    - **RELIANCE**
    - **ASIAN PAINTS**
    - **BERGER PAINTS**
    - **MUTHOOT FINANCE**

- The Companies taken for **NON-INDEXED Stocks** are:
  - **AMBUJA CEMENT**
  - **ASHOK LEYLAND**
  - **BHEL**
  - **SAIL**
  - **HAVELLS**
  - **SUN PHARMA**
  - **TRAVENCORE**
  - **DLF**
  - **HEILDCORE CEMENT**
  - **MRF**
- The graph obtained is shown below:
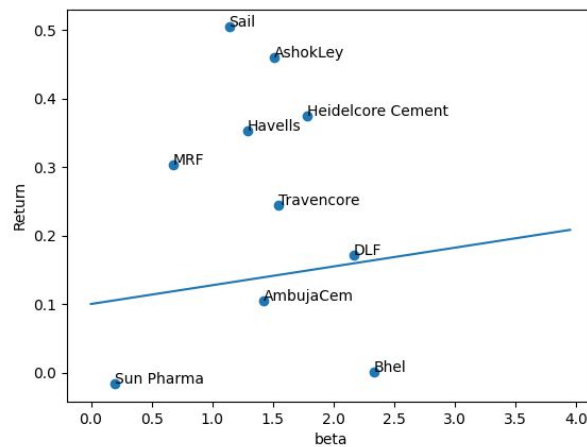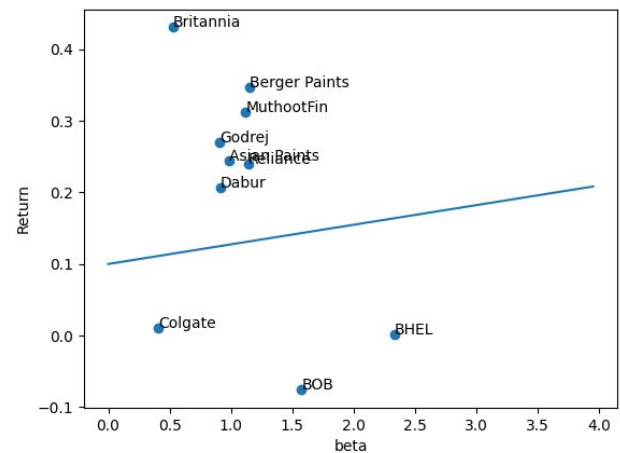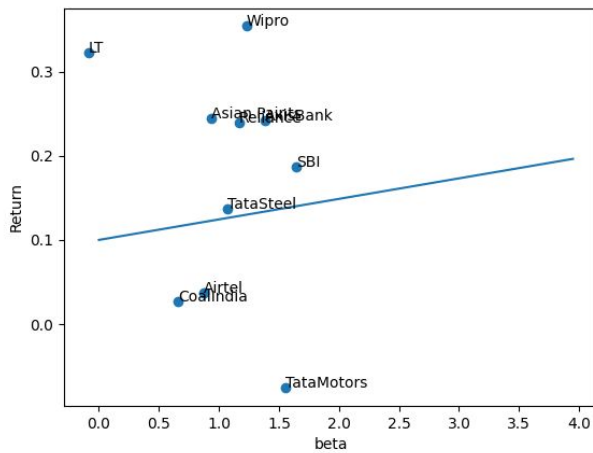
Ques.3

- To execute my .py file
  Run **$python3 180123029_NamanGoyal_q3.py** on the terminal. The snapshot is given below

```
~/Desktop/FE Labs/Lab05    python3 180123029_NamanGoyal_q3.py
Beta for BSE stocks ---------->
Stock : Airtel
Beta Value for the stock is : 0.8757074395751167
Stock : CoalIndia
Beta Value for the stock is : 0.659814962109014
Stock : LT
Beta Value for the stock is : -0.08905421807018798
Stock : Asian Paints
Beta Value for the stock is : 0.9371105520569233
Stock : SBI
Beta Value for the stock is : 1.6482926726893719
Stock : Wipro
Beta Value for the stock is : 1.2312522933572665
Stock : Reliance
Beta Value for the stock is : 1.1687100351940416
Stock : AxisBank
Beta Value for the stock is : 1.3847568624569127
Stock : TataMotors
Beta Value for the stock is : 1.5543923340089485
Stock : TataSteel
Beta Value for the stock is : 1.0668540642379034
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```

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Beta for NSE stocks ---------->
Stock : BHEL
Beta Value for the stock is : 2.334254182818425
Stock : BOB
Beta Value for the stock is : 1.5743905310295103
Stock : Britannia
Beta Value for the stock is : 0.530405536095149
Stock : Colgate
Beta Value for the stock is : 0.40684517089329925
Stock : Dabur
Beta Value for the stock is : 0.9135664414831083
Stock : Godrej
Beta Value for the stock is : 0.905630406166091
Stock : Reliance
Beta Value for the stock is : 1.139120153659605
Stock : Asian Paints
Beta Value for the stock is : 0.9846822866290704
Stock : Berger Paints
Beta Value for the stock is : 1.1543027290575332
Stock : MuthootFin
Beta Value for the stock is : 1.1193626490580029
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```

```
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Beta for NON-INDEXED STOCKS stocks ---------->
Stock : AmbujaCem
Beta Value for the stock is : 1.4244272024198776
Stock : AshokLey
Beta Value for the stock is : 1.5139652582572232
Stock : Bhel
Beta Value for the stock is : 2.334254182818425
Stock : Sail
Beta Value for the stock is : 1.138903962511079
Stock : Havells
Beta Value for the stock is : 1.2923951332206198
Stock : Sun Pharma
Beta Value for the stock is : 0.2000638779574416
Stock : Travencore
Beta Value for the stock is : 1.5468434043552093
Stock : DLF
Beta Value for the stock is : 2.1646847537973803
Stock : Heidelcore Cement
Beta Value for the stock is : 1.7785384850566777
Stock : MRF
Beta Value for the stock is : 0.6785925198886381
--------------------------------------------------------------------------
```

- The beta values of each stock are given above. **Some values are between 0 and 1 and others greater than 1.** The values between 0 and 1 show that these stocks increase in value slower than the market with low risk and value greater than 1 indicates that stocks grow faster than the market, with a high-risk factor.
- We can also observe that the Beta value of LT Stock is negative shows that the value of the stock is declining as the market rises.