STOCK ANALYSIS USING PYTHON

In [1]:
```
import pandas as pd
import matplotlib.pyplot as plt

tata_motors=pd.read_csv(r"C:\Users\pks91\OneDrive\Documents\Stock analysis pyt
tata_steel=pd.read_csv(r"C:\Users\pks91\OneDrive\Documents\Stock analysis pyth
tcs=pd.read_csv(r"C:\Users\pks91\OneDrive\Documents\Stock analysis python\arch

print(tcs.head())
tcs.shape
```

```
         Date Symbol Series  Prev Close    Open    High     Low    Last  \
0  2004-08-25    TCS     EQ      850.00  1198.7  1198.7  979.00  985.00
1  2004-08-26    TCS     EQ      987.95   992.0   997.0  975.30  976.85
2  2004-08-27    TCS     EQ      979.00   982.4   982.4  958.55  961.20
3  2004-08-30    TCS     EQ      962.65   969.9   990.0  965.00  986.40
4  2004-08-31    TCS     EQ      986.75   986.5   990.0  976.00  987.80

    Close     VWAP    Volume      Turnover  Trades  Deliverable Volume  \
0  987.95  1008.32  17116372  1.725876e+15     NaN             5206360
1  979.00   985.65   5055400  4.982865e+14     NaN             1294899
2  962.65   969.94   3830750  3.715586e+14     NaN              976527
3  986.75   982.65   3058151  3.005106e+14     NaN              701664
4  988.10   982.18   2649332  2.602133e+14     NaN              695234

   %Deliverble
0       0.3042
1       0.2561
2       0.2549
3       0.2294
4       0.2624
```

Out[1]:
```
(4139, 15)
```

In [2]:
```
tcs.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4139 entries, 0 to 4138
Data columns (total 15 columns):
 #   Column              Non-Null Count  Dtype  
---  ------              --------------  -----  
 0   Date                4139 non-null   object 
 1   Symbol              4139 non-null   object 
 2   Series              4139 non-null   object 
 3   Prev Close          4139 non-null   float64
 4   Open                4139 non-null   float64
 5   High                4139 non-null   float64
 6   Low                 4139 non-null   float64
 7   Last                4139 non-null   float64
 8   Close               4139 non-null   float64
 9   VWAP                4139 non-null   float64
 10  Volume              4139 non-null   int64  
 11  Turnover            4139 non-null   float64
 12  Trades              2456 non-null   float64
 13  Deliverable Volume  4139 non-null   int64  
 14  %Deliverble         4139 non-null   float64
dtypes: float64(10), int64(2), object(3)
memory usage: 485.2+ KB
```

In [3]:
```
tcs.isna().sum()
```

Out[3]:
```
Date                    0
Symbol                  0
Series                  0
Prev Close              0
Open                    0
High                    0
Low                     0
Last                    0
Close                   0
VWAP                    0
Volume                  0
Turnover                0
Trades               1683
Deliverable Volume      0
%Deliverble             0
dtype: int64
```

In [4]:
```
tata_steel.isna().sum()
```

Out[4]:
```
Date                    0
Symbol                  0
Series                  0
Prev Close              0
Open                    0
High                    0
Low                     0
Last                    0
Close                   0
VWAP                    0
Volume                  0
Turnover                0
Trades               2850
Deliverable Volume    514
%Deliverble           514
dtype: int64
```

In [5]:
```
tata_motors.isna().sum()
```

Out[5]:
```
Date                    0
Symbol                  0
Series                  0
Prev Close              0
Open                    0
High                    0
Low                     0
Last                    0
Close                   0
VWAP                    0
Volume                  0
Turnover                0
Trades               2850
Deliverable Volume    514
%Deliverble           514
dtype: int64
```

In [6]:
```
tata_motors.duplicated().sum()

tata_steel.duplicated().sum()

tcs.duplicated().sum()
```

Out[6]:
```
0
```

In [7]:
```
tcs.describe().round(2)
```

Out[7]:

	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover
count	4139.00	4139.00	4139.00	4139.00	4139.00	4139.00	4139.00	4139.00	4.139000e+03
mean	1693.84	1695.59	1715.88	1673.59	1694.31	1694.37	1694.62	1676761.95	2.952102e+14
std	722.88	722.98	728.45	717.78	723.18	723.06	723.14	1607879.26	3.849370e+14
min	366.65	360.00	377.75	358.00	365.70	366.65	368.40	18345.00	1.370237e+12
25%	1106.25	1105.53	1120.28	1088.58	1107.00	1106.50	1105.75	788477.50	1.050834e+14
50%	1633.50	1625.00	1655.00	1610.00	1630.05	1636.35	1629.42	1227748.00	1.824973e+14
75%	2326.12	2321.80	2345.00	2301.30	2325.00	2326.85	2319.90	2081119.50	3.455393e+14
max	3603.70	3625.00	3674.80	3572.55	3610.75	3603.70	3633.11	44033577.00	1.268362e+16

In [8]:
```
tata_motors.describe().round(2)
```

Out[8]:

	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnove
count	5306.00	5306.00	5306.00	5306.00	5306.00	5306.00	5306.00	5.306000e+03	5.306000e+0
mean	409.43	410.15	417.12	402.18	409.45	409.45	409.76	1.046560e+07	2.790772e+1
std	272.48	272.97	277.02	268.03	272.52	272.47	272.49	2.185034e+07	4.674351e+1
min	58.80	58.00	60.70	57.55	58.75	58.80	59.24	1.235100e+04	1.069384e+1
25%	174.60	174.76	178.82	171.01	174.72	174.60	175.18	1.668994e+06	7.049025e+1
50%	377.25	378.90	384.75	372.60	377.52	377.25	378.46	4.141648e+06	1.967418e+1
75%	523.15	523.48	530.80	515.91	523.49	523.15	523.72	8.706037e+06	3.175959e+1
max	1365.15	1361.00	1382.00	1347.00	1362.00	1365.15	1362.15	3.905778e+08	9.365671e+1

In [9]:
```
tata_steel.describe().round(2)
```

Out[9]:

	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	Turnover
count	5306.00	5306.00	5306.00	5306.00	5306.00	5306.00	5306.00	5306.00	5.306000e+03
mean	403.39	404.25	411.21	396.51	403.47	403.55	404.06	6165253.31	2.664876e+14
std	187.15	187.56	190.79	183.86	187.27	187.31	187.44	5329084.46	3.012861e+14
min	67.25	66.00	69.70	66.00	67.30	67.25	67.97	23291.00	2.159165e+11
25%	275.77	275.60	284.41	270.00	275.81	275.94	276.94	2801379.50	1.118719e+14
50%	402.85	403.00	409.38	396.65	402.70	402.90	403.43	4800300.50	1.949303e+14
75%	523.99	525.00	534.72	516.49	523.95	524.08	525.23	7833888.00	3.379640e+14
max	1031.35	1024.00	1052.60	1011.10	1035.00	1034.00	1031.95	64284599.00	4.881124e+15

In [10]:
```
tata_motors["Date"]=pd.to_datetime(tata_motors["Date"])
tata_steel["Date"]=pd.to_datetime(tata_steel["Date"])
tcs["Date"]=pd.to_datetime(tcs["Date"])
```

In [11]:
```
tcs.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4139 entries, 0 to 4138
Data columns (total 15 columns):
 #   Column              Non-Null Count  Dtype         
---  ------              --------------  -----         
 0   Date                4139 non-null   datetime64[ns]
 1   Symbol              4139 non-null   object        
 2   Series              4139 non-null   object        
 3   Prev Close          4139 non-null   float64       
 4   Open                4139 non-null   float64       
 5   High                4139 non-null   float64       
 6   Low                 4139 non-null   float64       
 7   Last                4139 non-null   float64       
 8   Close               4139 non-null   float64       
 9   VWAP                4139 non-null   float64       
 10  Volume              4139 non-null   int64         
 11  Turnover            4139 non-null   float64       
 12  Trades              2456 non-null   float64       
 13  Deliverable Volume  4139 non-null   int64         
 14  %Deliverble         4139 non-null   float64       
dtypes: datetime64[ns](1), float64(10), int64(2), object(2)
memory usage: 485.2+ KB
```

In [12]:
```
tata_motors=tata_motors.drop(['Trades','Deliverable Volume','%Deliverble'], ax
tata_steel=tata_steel.drop(['Trades','Deliverable Volume','%Deliverble'], axis
tcs=tcs.drop(['Trades','Deliverable Volume','%Deliverble'], axis=1)
```

In [13]:
```
tata_motors.isna().sum()
```

Out[13]:
```
Date          0
Symbol        0
Series        0
Prev Close    0
Open          0
High          0
Low           0
Last          0
Close         0
VWAP          0
Volume        0
Turnover      0
dtype: int64
```

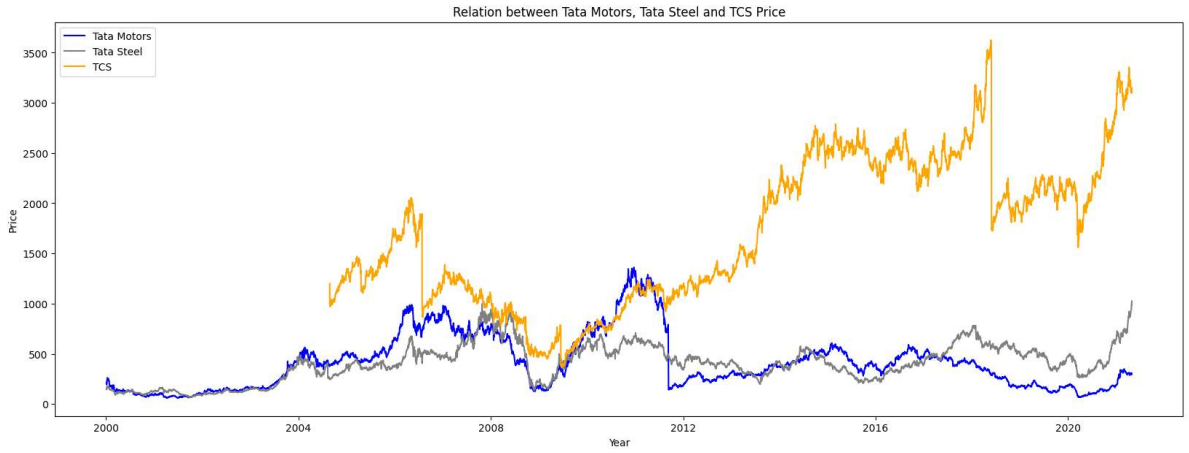
In [14]:
```
tata_motors['Month']=tata_motors["Date"].dt.month
tata_motors['Year']=tata_motors["Date"].dt.year
tata_motors['Day']=tata_motors["Date"].dt.day


tata_steel['Month']=tata_steel["Date"].dt.month
tata_steel['Year']=tata_steel["Date"].dt.year
tata_steel['Day']=tata_steel["Date"].dt.day


tcs['Day']=tcs['Date'].dt.day
tcs['Year']=tcs['Date'].dt.year
tcs['Month']=tcs['Date'].dt.month
```

In [15]:
```
tcs.head()
```

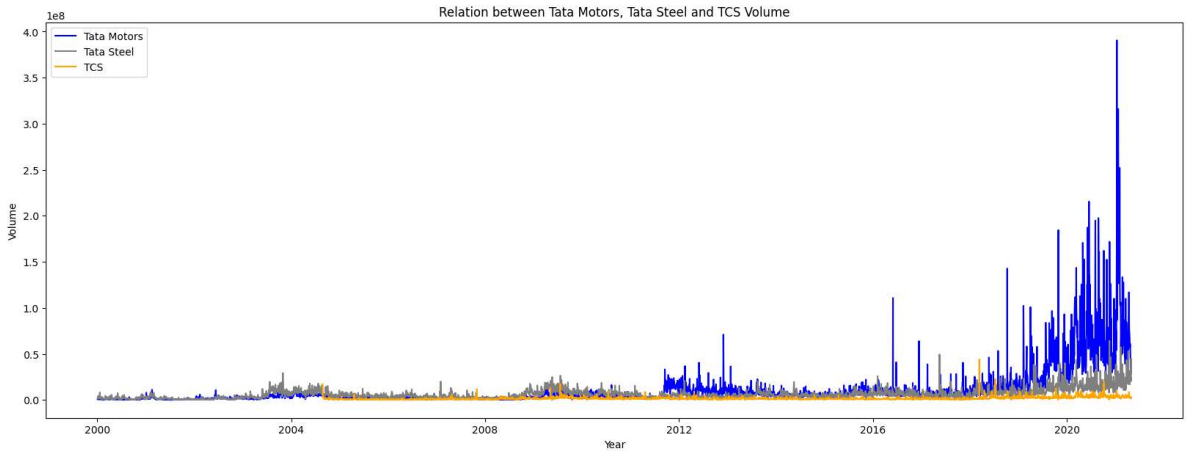
Out[15]:

	Date	Symbol	Series	Prev Close	Open	High	Low	Last	Close	VWAP	Volume	
0	2004-08-25	TCS	EQ	850.00	1198.7	1198.7	979.00	985.00	987.95	1008.32	17116372	1.7
1	2004-08-26	TCS	EQ	987.95	992.0	997.0	975.30	976.85	979.00	985.65	5055400	4.9
2	2004-08-27	TCS	EQ	979.00	982.4	982.4	958.55	961.20	962.65	969.94	3830750	3.7
3	2004-08-30	TCS	EQ	962.65	969.9	990.0	965.00	986.40	986.75	982.65	3058151	3.0
4	2004-08-31	TCS	EQ	986.75	986.5	990.0	976.00	987.80	988.10	982.18	2649332	2.6

In [16]:
```
plt.figure(figsize=(20,7))

plt.plot(tata_motors['Date'],tata_motors['Open'],color='blue',label='Tata Moto

plt.plot(tata_steel['Date'],tata_steel['Open'],color='grey',label='Tata Steel'

plt.plot(tcs['Date'],tcs['Open'],color='orange',label='TCS')

plt.title("Relation between Tata Motors, Tata Steel and TCS Price")

plt.xlabel("Year")

plt.ylabel("Price")

plt.legend(title="")

plt.show()
```



In [17]:
```
plt.figure(figsize=(20,7))
plt.plot(tata_motors['Date'],tata_motors['Volume'],color='blue',label='Tata Mo
plt.plot(tata_steel['Date'],tata_steel['Volume'],color='grey',label='Tata Stee
plt.plot(tcs['Date'],tcs['Volume'],color='orange',label='TCS')
plt.title("Relation between Tata Motors, Tata Steel and TCS Volume")
plt.xlabel("Year")
plt.ylabel("Volume")
plt.legend(title="")
plt.show()
```



In [18]:
```
sumTM=0 #total amount invested in Tata Motors

s1=0 #number of shares owned by Tata Motors

#calcuating total amount invested and number of shares owned in Tata Motors

for i in range(len(tata_motors)):

    if tata_motors.loc[i,'Day']==30:

        sumTM+=tata_motors.loc[i,'Open']

        s1+=1

#displaying basic results

print("Total Invested in Tata Motors = Rs",round(sumTM,2))
print("Shares Owned of Tata Motors =",s1)
print("Average Investmentment of 1 share = Rs",round((sumTM/s1),2))



tm_end=298.2 #last open price of Tata Motors on 2021-04-30

#obtained by looking at the data or can be seen after executing tata_motors.ta

#calculating investment results

result1=round((tm_end*s1)-sumTM,2)

roiTM=round((result1/sumTM)*100,2)

#displaying investment results

print("nInvestment Result:")
if result1<0:
    print("Net Unrealised Loss = Rs",result1)
else:
    print("Net Unrealised Profit = Rs",result1)

print("Tata Motors ROI from 2000-1-3 to 2021-04-30 =",roiTM,"%")
```

```
Total Invested in Tata Motors = Rs 65977.3
Shares Owned of Tata Motors = 162
Average Investmentment of 1 share = Rs 407.27
nInvestment Result:
Net Unrealised Loss = Rs -17668.9
Tata Motors ROI from 2000-1-3 to 2021-04-30 = -26.78 %
```

In [19]:
```
sumTS=0 #total amount invested in Tata Steel

s2=0 #number of shares owned by Tata Steel

#calcuating total amount invested and number of shares owned in Tata Steel

for i in range(len(tata_steel)):

    if tata_steel.loc[i,'Day']==30:

        sumTS+=tata_steel.loc[i,'Open']

        s2+=1


#displaying basic results

print("Total Invested in Tata Steel = Rs",round(sumTS,2))

print("Shares Own of Tata Steel =",s2)

print("Average Investmentment of 1 share = Rs",round((sumTS/s2),2))


ts_end=1024 #last open price of Tata Steel on 2021-04-30

#obtained by looking at the data or can be seen after executed tata_steel.tail


#calculating investment results

result2=round((ts_end*s2)-sumTS,2)

roiTS=round((result2/sumTS)*100,2)


#displaying investment results

print("nInvestment Result:")


if result2<0:

    print("Net Unrealised Loss = Rs",result2)

else:

    print("Net Unrealised Profit = Rs",result2)

print("Tata Steel ROI from 2000-1-3 to 2021-04-30 =",roiTS,"%")
```

```
Total Invested in Tata Steel = Rs 65825.9
Shares Own of Tata Steel = 162
Average Investmentment of 1 share = Rs 406.33
nInvestment Result:
Net Unrealised Profit = Rs 100062.1
Tata Steel ROI from 2000-1-3 to 2021-04-30 = 152.01 %
```

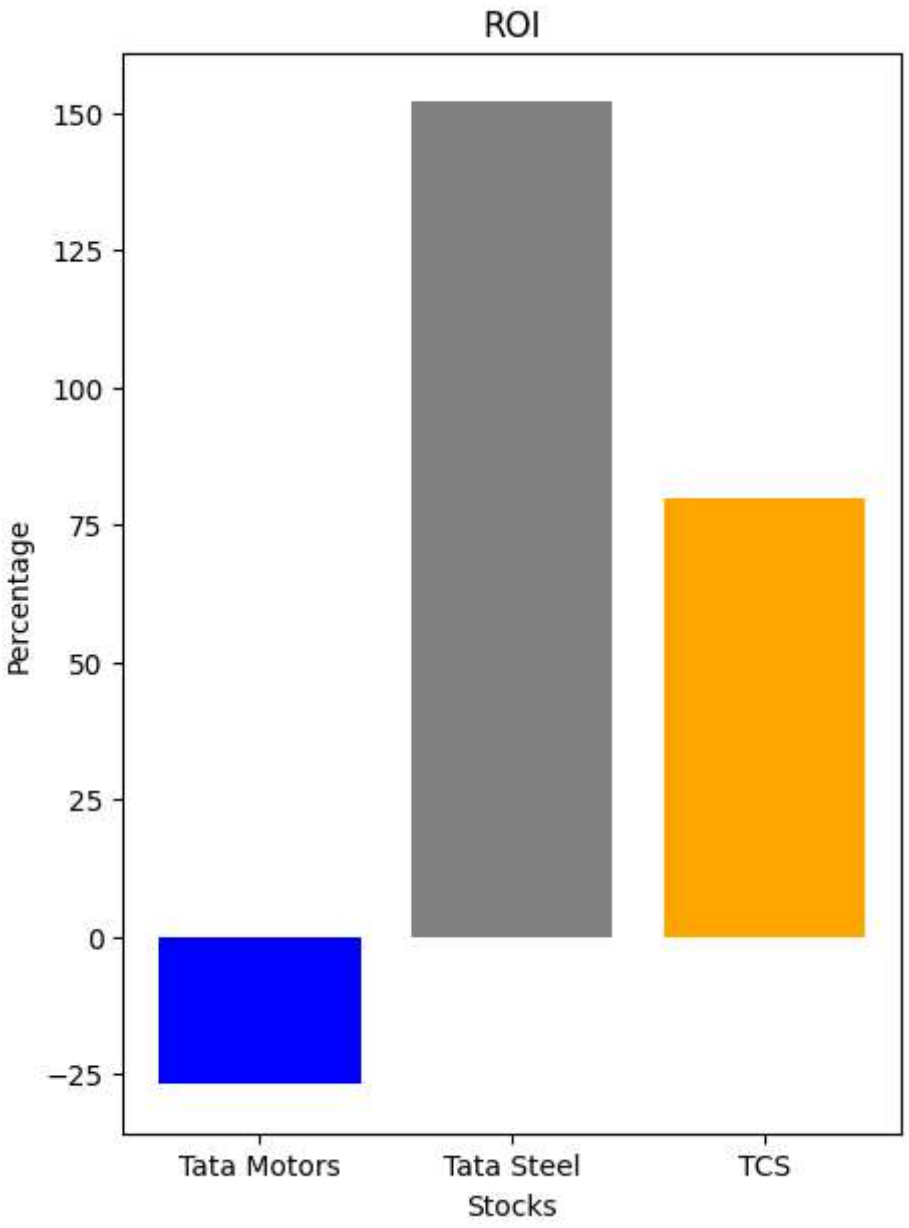
In [20]:
```
sumTCS=0 #total amount invested in TCS

s3=0 #number shares owned of TCS



#calcuating total amount invested and number of shares owned in TCS

for i in range(len(tcs)):

    if tcs.loc[i,'Day']==30:

        sumTCS+=tcs.loc[i,'Open']

        s3+=1



#displaying basic results

print("Total Invested in TCS = Rs",round(sumTCS,2))

print("Shares Owned of TCS =",s3)

print("Average Investmentment of 1 share = Rs",round((sumTCS/s3),2))



tcs_end=3099 #last open price of TCS on 2021-04-30

#obtained by looking at the data or can be seen after executed tcs.tail()



#calculating investment results

result3=round((tcs_end*s3)-sumTCS,2)

roiTCS=round((result3/sumTCS)*100,2)

#displaying investment results

print("nInvestment Result:")

if result3<0:

    print("Net Unrealised Loss = Rs",result3)

else:

    print("Net Unrealised Proift = Rs",result3)
```

```
print("Tata Steel ROI from 2004-08-25 to 2021-04-30 =",roiTCS,"%")
```

```
Total Invested in TCS = Rs 220762.0
Shares Owned of TCS = 128
Average Investmentment of 1 share = Rs 1724.7
nInvestment Result:
Net Unrealised Proift = Rs 175910.0
Tata Steel ROI from 2004-08-25 to 2021-04-30 = 79.68 %
```

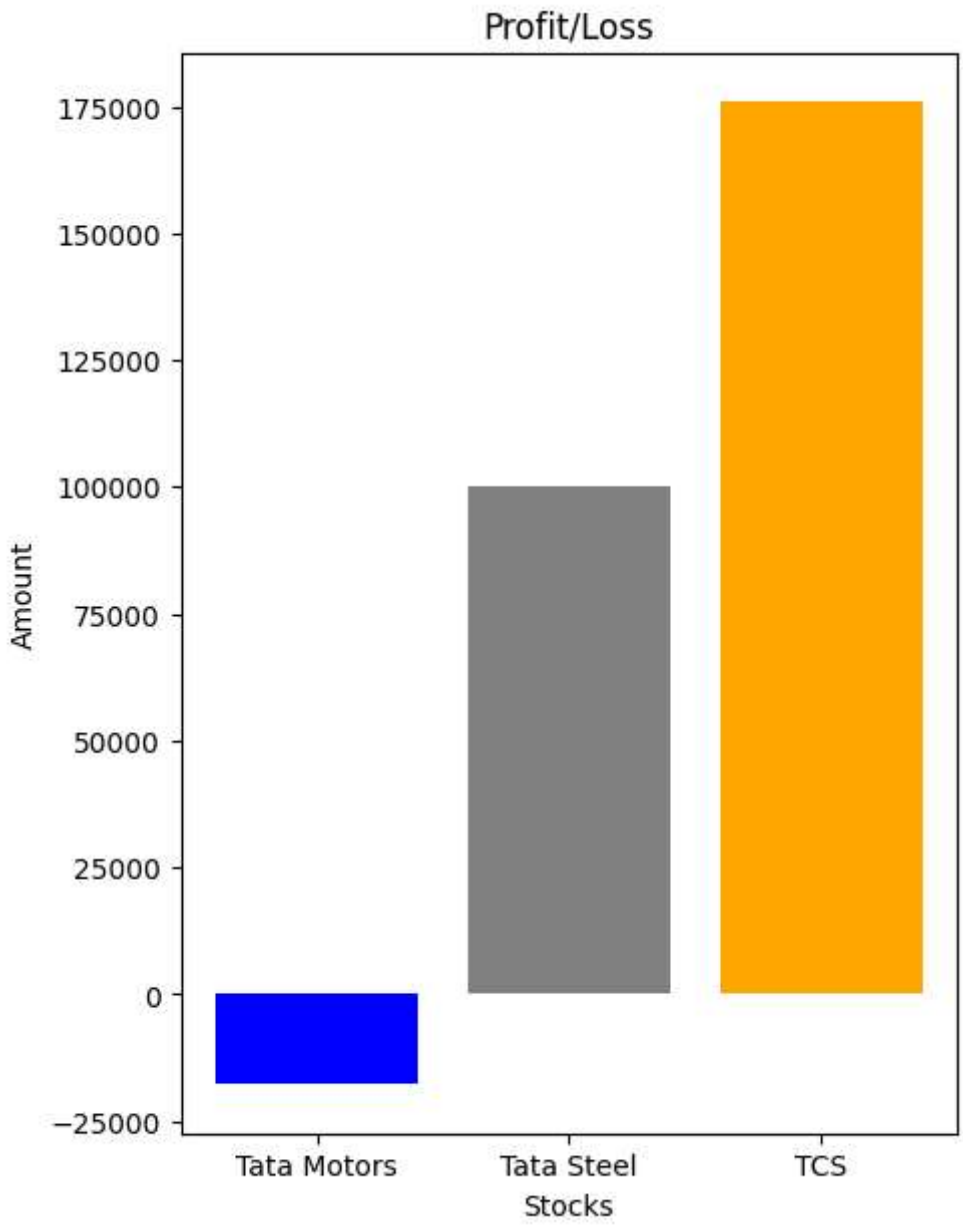
In [21]:
```
plt.figure(figsize=(5,7))

stock=['Tata Motors','Tata Steel','TCS']

ROI=[roiTM,roiTS,roiTCS]

col=['Blue','Grey','Orange']

plt.bar(stock,ROI,color=col)

plt.title("ROI")

plt.xlabel("Stocks")

plt.ylabel("Percentage")
```

Out[21]:
```
Text(0, 0.5, 'Percentage')
```



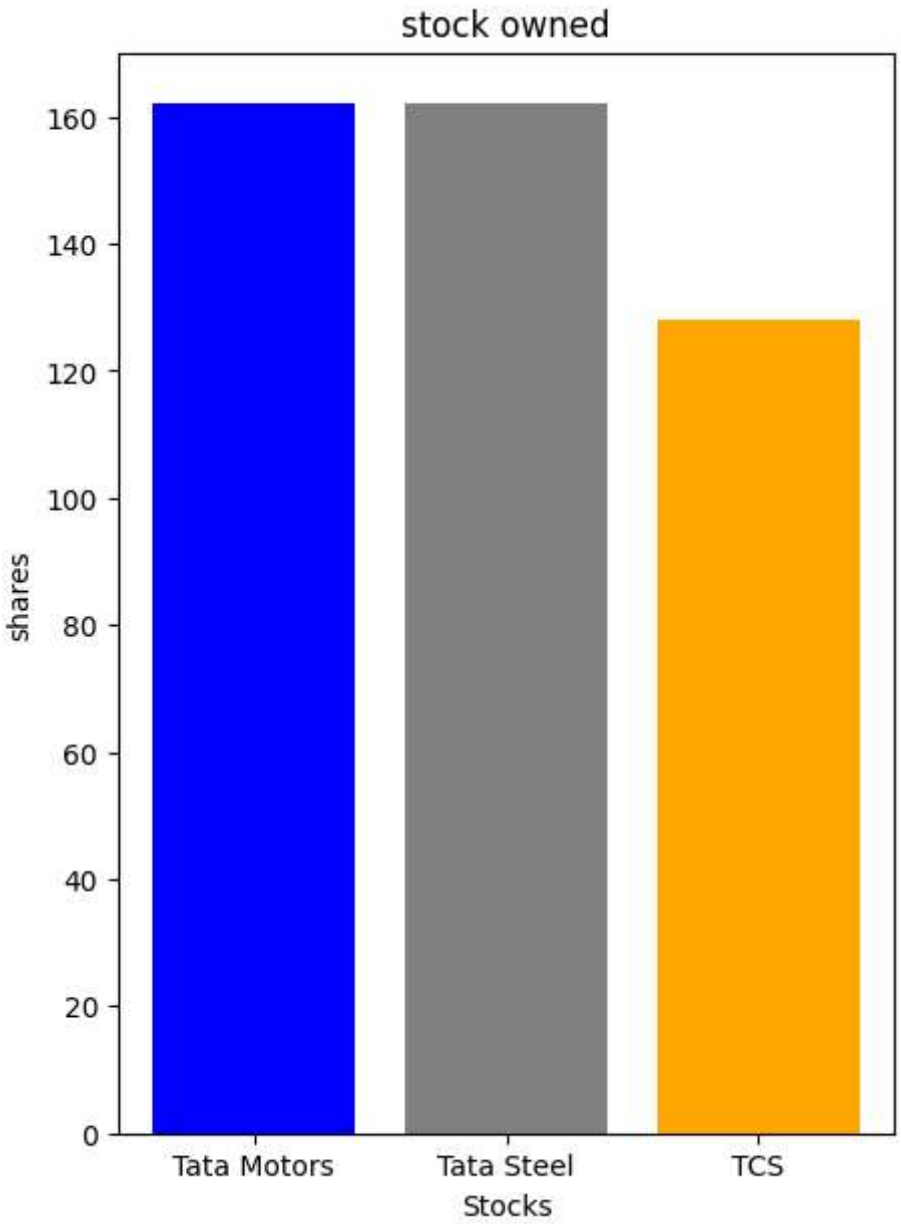
In [22]:
```
plt.figure(figsize=(5,7))

stock=['Tata Motors','Tata Steel','TCS']

amt=[result1,result2,result3]

col=['Blue','Grey','Orange']

plt.bar(stock,amt,color=col)

plt.title("Profit/Loss")

plt.xlabel("Stocks")

plt.ylabel("Amount")
```

Out[22]:
```
Text(0, 0.5, 'Amount')
```



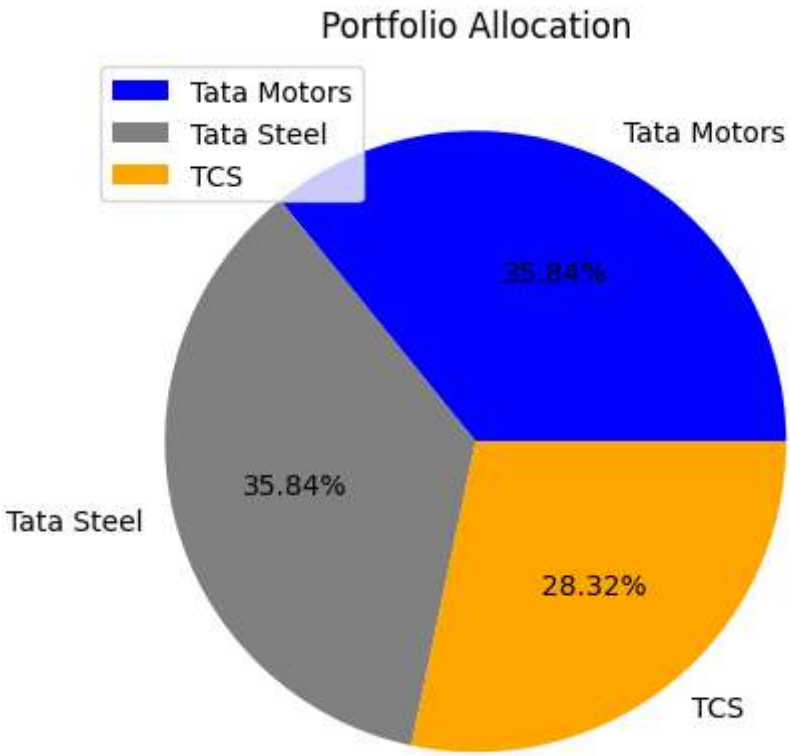
In [23]:
```
plt.figure(figsize=(5,7))

stock=['Tata Motors','Tata Steel','TCS']

shares=[s1,s2,s3]

col=['Blue','Grey','Orange']

plt.bar(stock,shares,color=col)

plt.title("stock owned")

plt.xlabel("Stocks")

plt.ylabel("shares")
```

Out[23]:
```
Text(0, 0.5, 'shares')
```



In [24]:
```
plt.figure(figsize=(5,7))

stock=['Tata Motors','Tata Steel','TCS']

shares=[s1,s2,s3]

col=['Blue','Grey','Orange']

plt.pie(shares,labels=stock,autopct="%1.2f%%",colors=col)

plt.legend(title="",loc="upper left")

plt.title("Portfolio Allocation")
```

Out[24]:
```
Text(0.5, 1.0, 'Portfolio Allocation')
```



In [ ]:
```

```