Banking_Stocks_Analysis(Data_Analysis_Project)

May 21, 2024

[1]:
```
import yfinance as yf
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
from matplotlib.pyplot import figure
from datetime import datetime
```

1 Data extraction from Yahoo Finance using the yfinance Python library

[2]:
```
end = datetime.now()
end
```

[2]:
```
datetime.datetime(2024, 5, 4, 16, 41, 7, 389693)
```

[3]:
```
start_date = datetime(end.year-1,end.month,end.day)
start_date
```

[3]:
```
datetime.datetime(2023, 5, 4, 0, 0)
```

[4]:
```
stock_list=['AXISBANK.NS', 'ICICIBANK.NS','KOTAKBANK.NS','HDFCBANK.NS']
```

[5]:
```
name_stock=[]
name_df=[]

for stock_symbol in stock_list:
    df = yf.download(stock_symbol, start=start_date, end=end, progress=False) ␣
  ↪# Download data for the current stock

    df.reset_index(inplace=True)  # Reset index

    stock_name = stock_symbol.split('.')[0]  # Extract stock name from symbol
    name_stock.append(stock_name)

    df['Company'] = stock_name    # Add a column for Company with the stock name
    df_name = f"{stock_name.lower()}_df"  # Define DataFrame name dynamically using the stock name
    name_df.append(df_name)

    globals()[df_name] = df  # Assign the DataFrame to the dynamically created name
```

[6]:
```
name_df
```

[6]:
```
['axisbank_df', 'icicibank_df', 'kotakbank_df', 'hdfcbank_df']
```

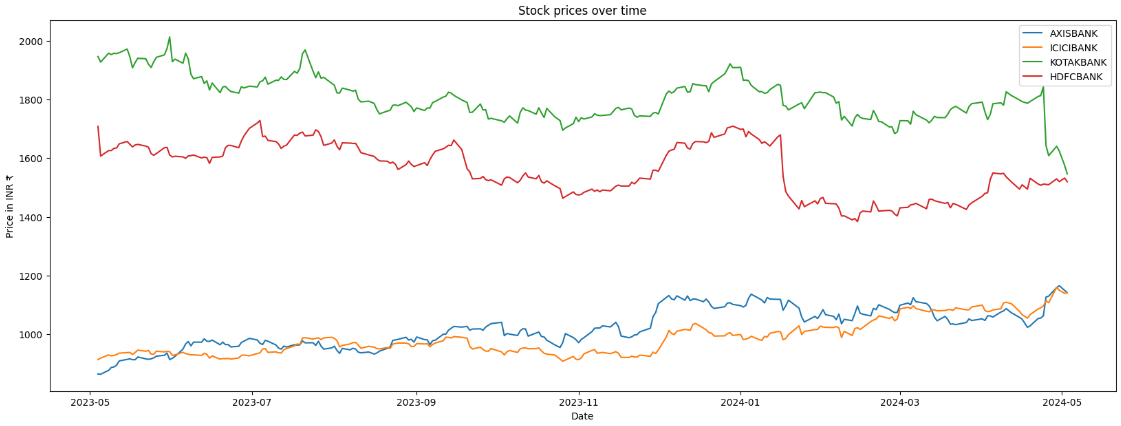
[7]:
```
name_stock
```

[7]:
```
['AXISBANK', 'ICICIBANK', 'KOTAKBANK', 'HDFCBANK']
```

2 Line plot for each company - Change in stock price over time

[8]:
```
plt.figure(figsize=(20, 7))
for df_name, stock_name in zip(name_df, name_stock):
    df = globals()[df_name]
    plt.plot(df['Date'], df['Adj Close'], label=stock_name)

# Adding labels and legend
plt.xlabel('Date')
plt.ylabel("Price in INR  ")
plt.title("Stock prices over time")
plt.legend()
plt.show()
```

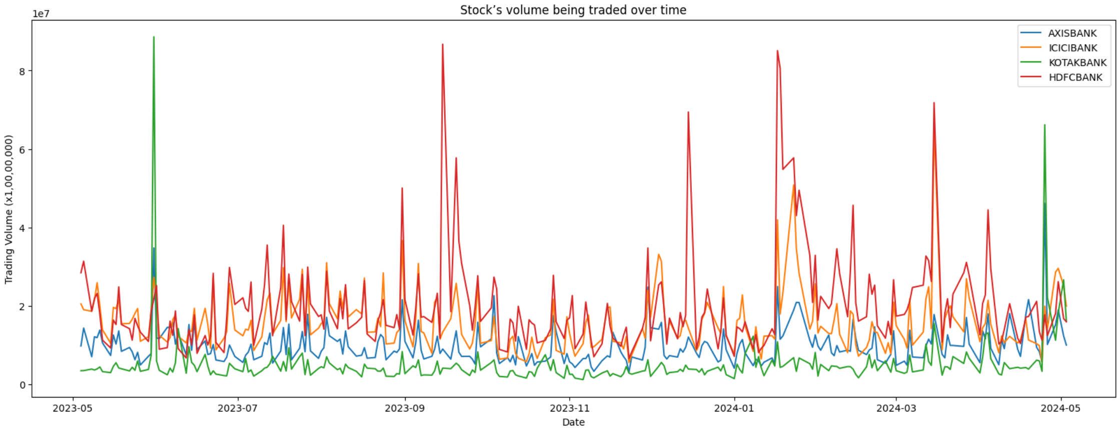


3 Line plot for each company - Change in a stock's volume being traded over time

[9]:

```
plt.figure(figsize=(20, 7))
for df_name, stock_name in zip(name_df, name_stock):
    df = globals()[df_name]
    plt.plot(df['Date'], df['Volume'], label=stock_name)

# Adding labels and legend
plt.xlabel('Date')
plt.ylabel("Trading Volume (x1,00,00,000)")
plt.title("Stock's volume being traded over time")
plt.legend()
plt.show()
```

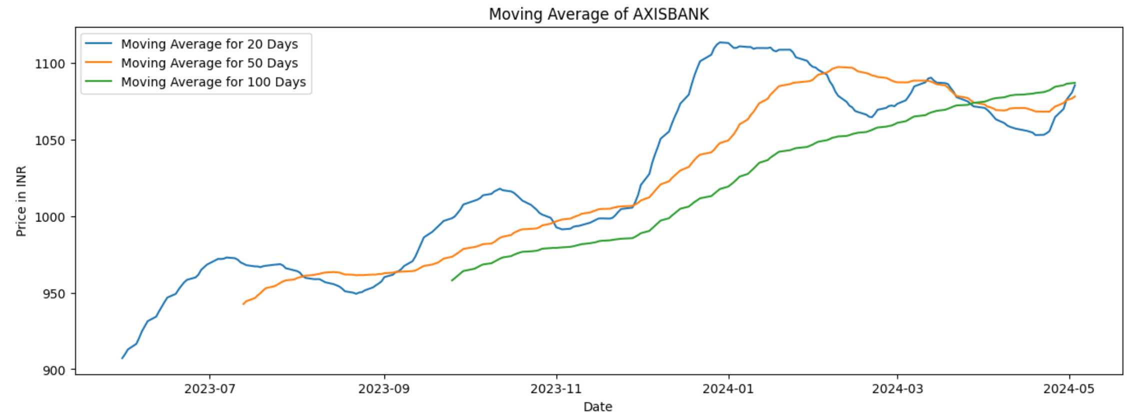


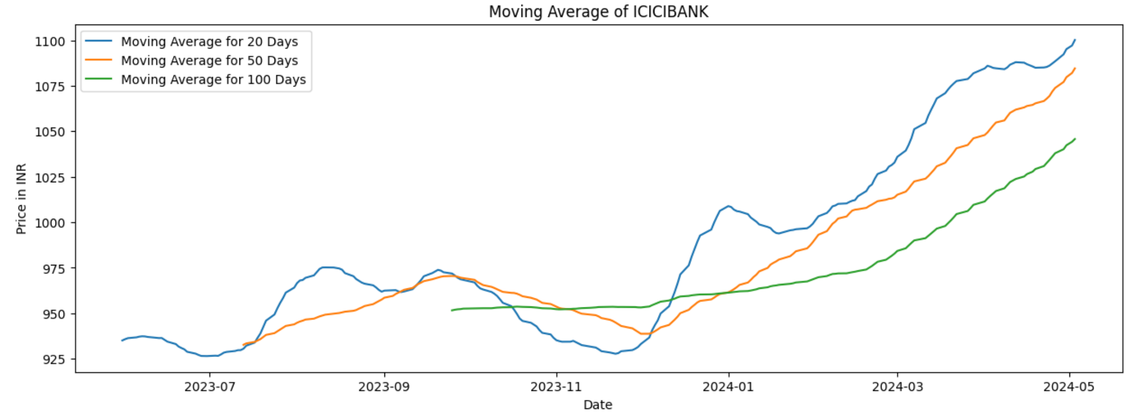
4 Line plot for each company - Moving average of various stocks

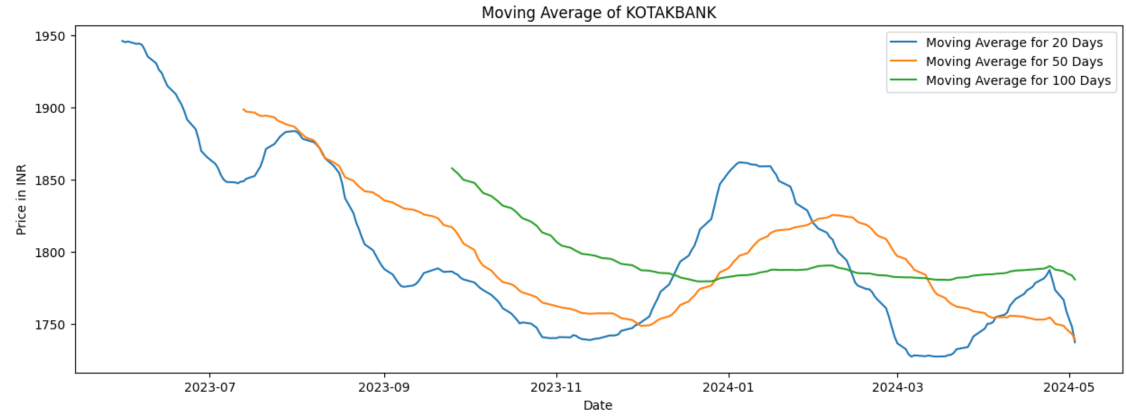
[10]:

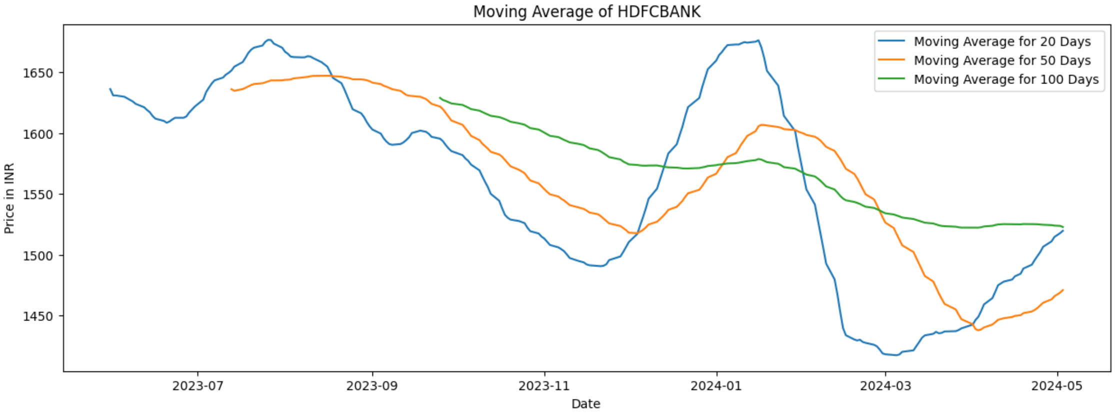
```
for df_name, stock_name in zip(name_df, name_stock):
    df = globals()[df_name]   # Access DataFrame by name
    df['MA for 20 Days'] = df['Adj Close'].rolling(20).mean()
    df['MA for 50 Days'] = df['Adj Close'].rolling(50).mean()
    df['MA for 100 Days'] = df['Adj Close'].rolling(100).mean()

    plt.figure(figsize=(15, 5))
    plt.plot(df['Date'], df['MA for 20 Days'], label="Moving Average for 20␣
 ↪Days")
    plt.plot(df['Date'], df['MA for 50 Days'], label="Moving Average for 50␣
 ↪Days")
    plt.plot(df['Date'], df['MA for 100 Days'], label="Moving Average for 100␣
 ↪Days")
    plt.xlabel("Date")
    plt.ylabel("Price in INR")
    plt.title(f"Moving Average of {stock_name}")
    plt.legend()
    plt.show()
```



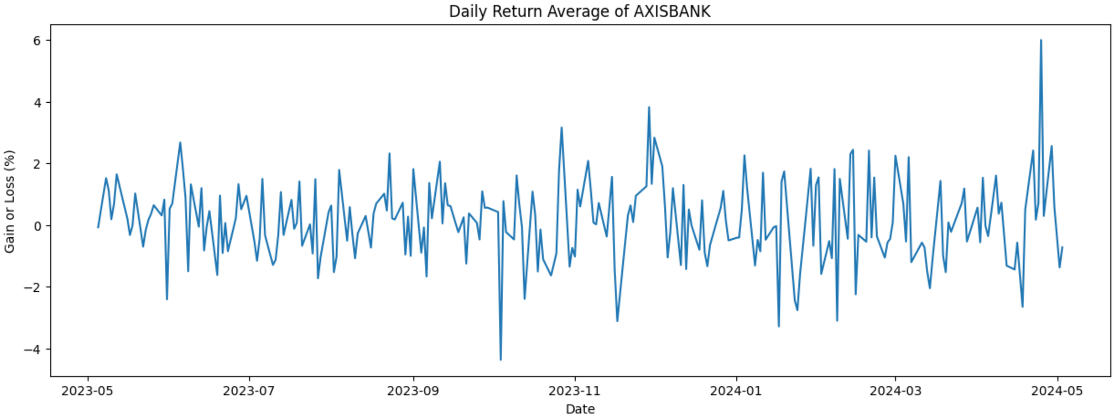


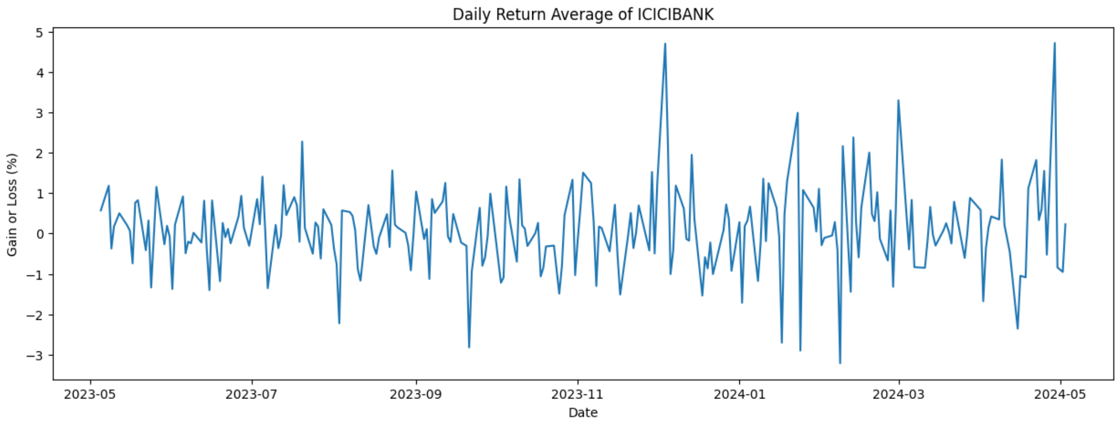


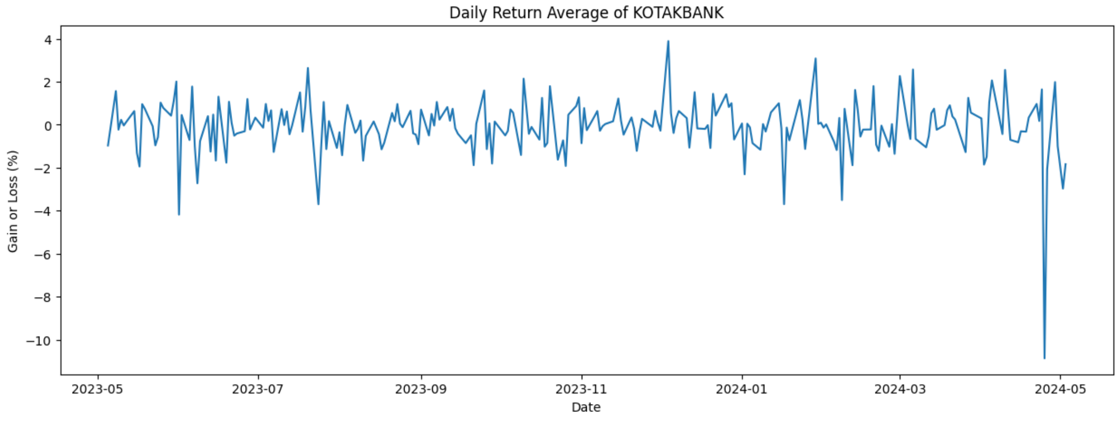


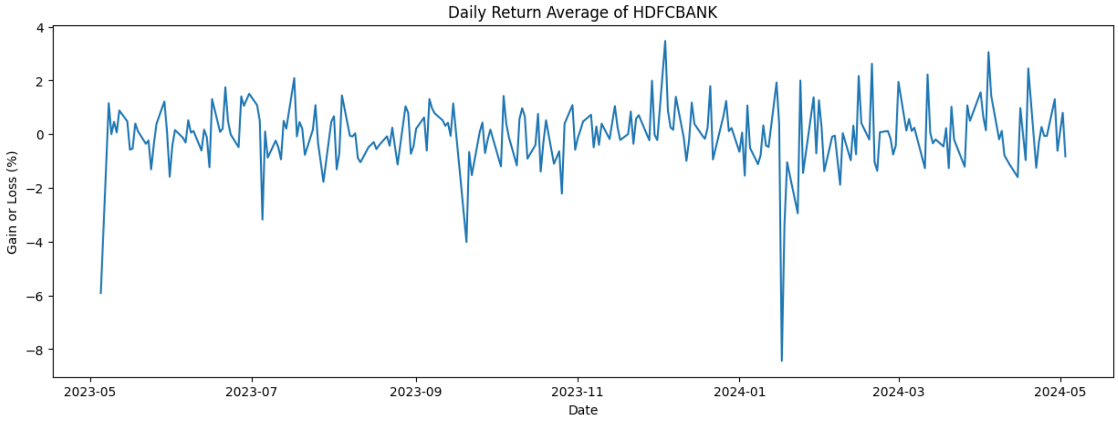
5 Line plot for each company - Daily Return average of various stocks

```
[11]: for df_name, stock_name in zip(name_df, name_stock):
          df = globals()[df_name]   # Access DataFrame by name
          df['Daily Return %'] = df['Adj Close'].pct_change()* 100
          plt.figure(figsize=(15, 5))
          plt.plot(df['Date'],df['Daily Return %'])
          plt.xlabel("Date")
          plt.ylabel("Gain or Loss (%)")
          plt.title(f"Daily Return Average of {stock_name}")
          #plt.legend()
          plt.show()
```



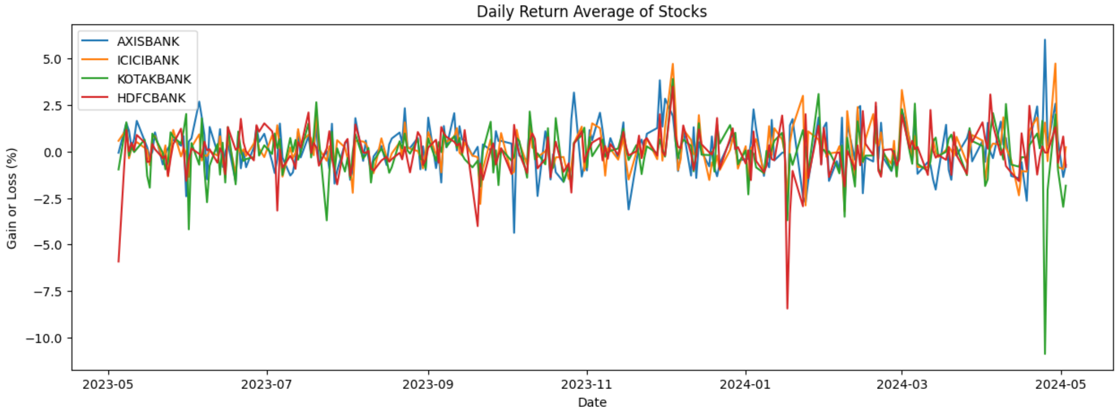






[12]:
```
plt.figure(figsize=(15, 5))
for df_name, stock_name in zip(name_df, name_stock):
    df = globals()[df_name]   # Access DataFrame by name
    df['Daily Return %'] = df['Adj Close'].pct_change()* 100
    plt.plot(df['Date'],df['Daily Return %'],label=stock_name)

plt.xlabel("Date")
plt.ylabel("Gain or Loss (%)")
plt.title("Daily Return Average of Stocks")
plt.legend()
plt.show()
```



6 Adding a new column 'Trend' whose values are based on the 'Daily Return' & Visualizing trend frequency through a Pie Chart

[13]:
```
def trend(x):
  if x > -1.5 and x <= 1.5:
    return 'Slight or No change'
  elif x > 1.5 and x <= 4:
    return 'Slight Positive'
  elif x < -1.5 and x >= -4:
    return 'Slight Negative'
  elif x > 4 and x <= 6:
    return 'Positive'
  elif x < -4 and x >= -6:
    return 'Negative'
  elif x > 6 and x <= 7:
    return 'Among top gainers'
  elif x < -6 and x >= -7:
    return 'Among top losers'
  elif x > 7:
    return 'Bull run'
  elif x <= -7:
    return 'Bear drop'
```

[14]:

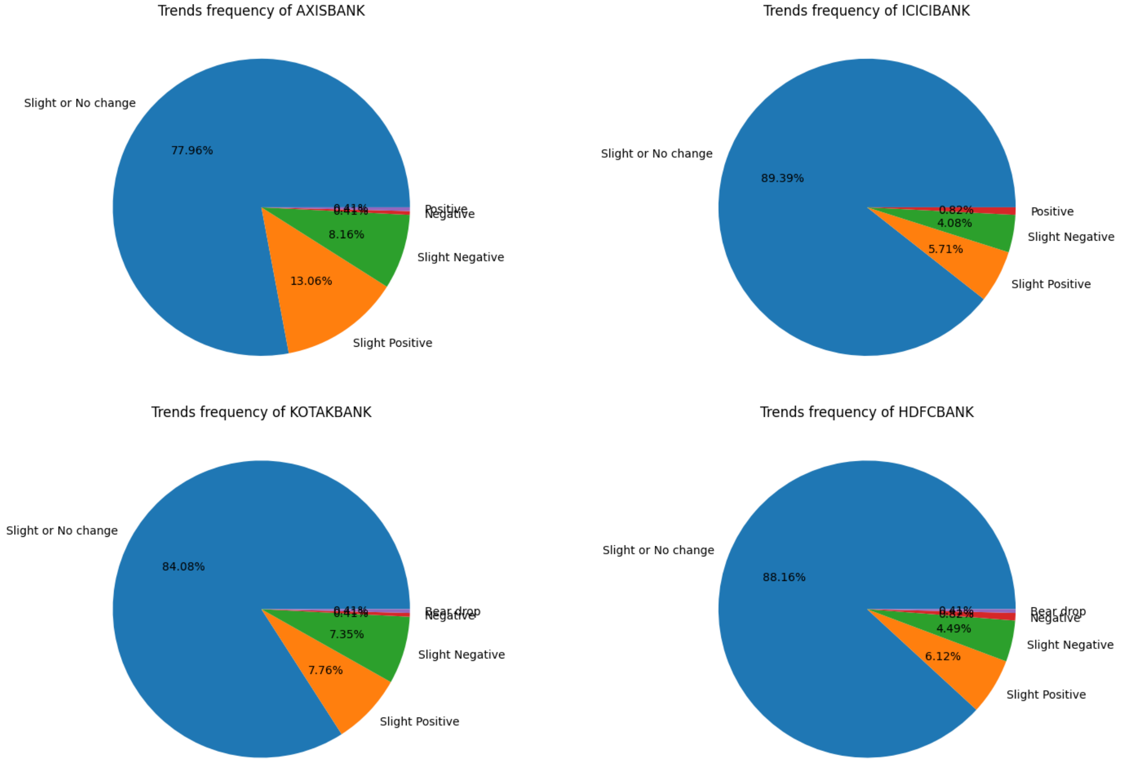
```
# Initialize the figure and subplots
fig, axes = plt.subplots(nrows=2, ncols=2, figsize=(15, 10))

# Iterate through each DataFrame and plot the pie chart on respective subplot
for i, (df_name, stock_name) in enumerate(zip(name_df, name_stock)):
    df = globals()[df_name]  # Access DataFrame by name
    df['Trend'] = df['Daily Return %'].apply(lambda x: trend(x))
    trendpie = df['Trend'].value_counts()

    # Calculate the row and column index for subplot
    row_index = i // 2
    col_index = i % 2

    # Plot the pie chart on respective subplot
    axes[row_index, col_index].pie(trendpie.values, labels=trendpie.index,␣
 ↪autopct='%1.2f%%')
    axes[row_index, col_index].set_title(f"Trends frequency of {stock_name}")

# Adjust layout
plt.tight_layout()
plt.show()
```



7 Correlation between the daily returns of different stocks

[15]:
```
# Create a DataFrame from selected columns of each DataFrame using name_df and␣
 ↪name_stock
df = pd.DataFrame({stock_name: globals()[df_name]['Adj Close'] for df_name,␣
 ↪stock_name in zip(name_df, name_stock)})
```

[16]:
```
df
```

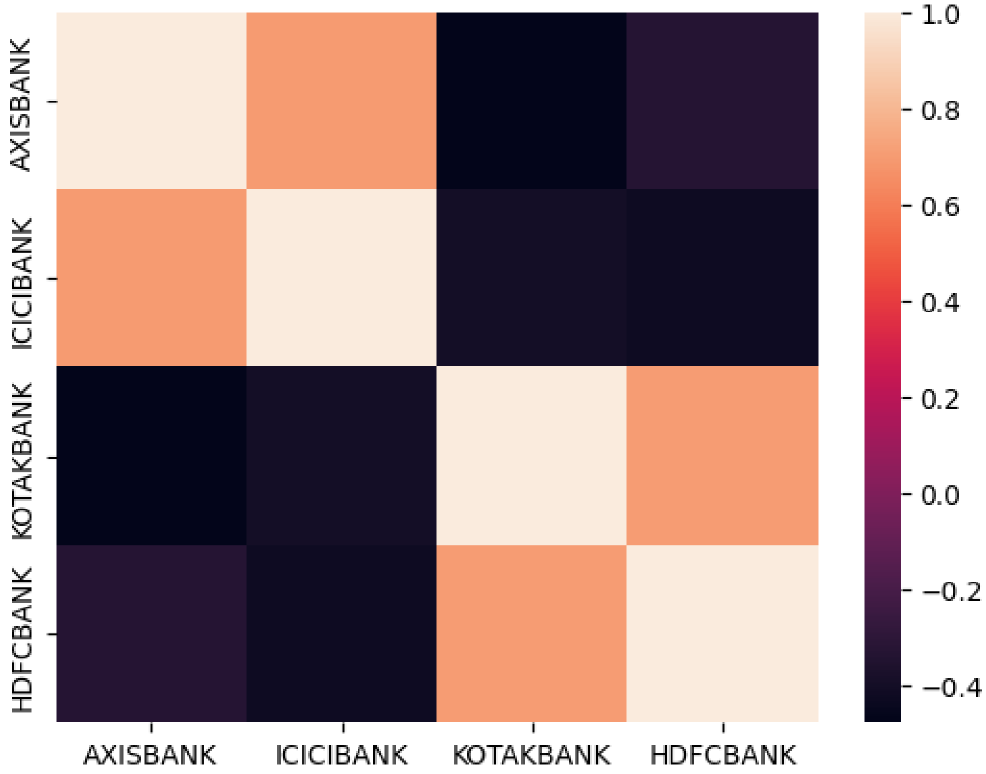
[16]:
```
        AXISBANK    ICICIBANK    KOTAKBANK     HDFCBANK
0     865.067261   914.175171  1945.997681  1708.210449
1     864.417908   919.382263  1927.113159  1607.218628
2     877.554504   930.242920  1957.238403  1625.805420
3     887.344482   926.771484  1952.692261  1625.854858
4     888.992859   928.407959  1957.088501  1633.368652
..           …            …            …            …
241  1130.300049  1107.900024  1608.500000  1509.800049
242  1159.250000  1160.150024  1640.400024  1529.500000
243  1165.900024  1150.400024  1623.949951  1520.099976
244  1149.849976  1139.449951  1575.650024  1532.250000
245  1141.500000  1142.050049  1546.699951  1519.599976

[246 rows x 4 columns]
```

[17]:
```
df.corr()
```

[17]:
```
           AXISBANK  ICICIBANK  KOTAKBANK  HDFCBANK
AXISBANK   1.000000   0.695754  -0.477334 -0.330993
ICICIBANK  0.695754   1.000000  -0.397763 -0.425357
KOTAKBANK -0.477334  -0.397763   1.000000  0.703226
HDFCBANK  -0.330993  -0.425357   0.703226  1.000000
```

[18]:
```
sns.heatmap(df.corr())
plt.show()
```


AXISBANK
ICICIBANK
KOTAKBANK
HDFCBANK
AXISBANK
ICICIBANK
KOTAKBANK
HDFCBANK
1.0
0.8
0.6
0.4
0.2
0.0
−0.2
−0.4