EXPT NO: 8	MINI PROJECT –Stock Market Analysis Dashboard

AIM

To design and develop an interactive stock market analysis dashboard that provides real-time insights into stock prices, trends, and performance using data visualization and machine learning techniques for better investment decisions.

ALGORITHM

1. Start
2. Import Dataset: Load historical stock market data (e.g., CSV or API).
3. Data Cleaning: Handle missing values, remove duplicates, and format date columns.
4. Data Preprocessing:
   - Convert date fields to datetime.
   - Calculate moving averages, daily returns, and cumulative returns.
   - Add technical indicators (SMA, EMA, RSI, MACD).
5. Visualization:
   - Line chart for stock price trend.
   - Candlestick chart for open-high-low-close (OHLC).
   - Bar chart for daily trading volume.
   - Heatmap for stock correlation.
6. Dashboard Design:
   - Combine all visualizations using Python (Streamlit).
   - Add filters for stock symbol, date range, and time interval.
7. Insights Generation:
   - Identify top performing stocks.
   - Observe volatility and risk-return ratio.
8. Display Final Dashboard.
9. Stop.

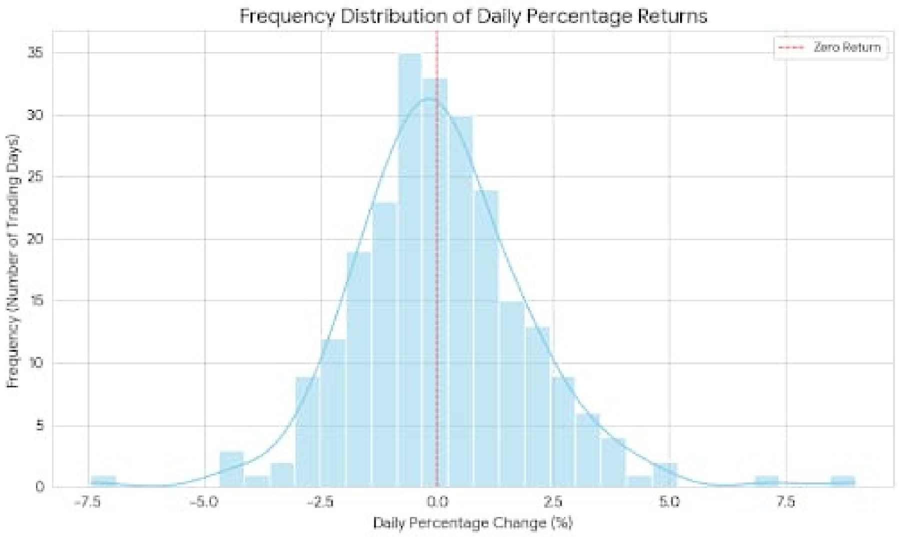
CODING:

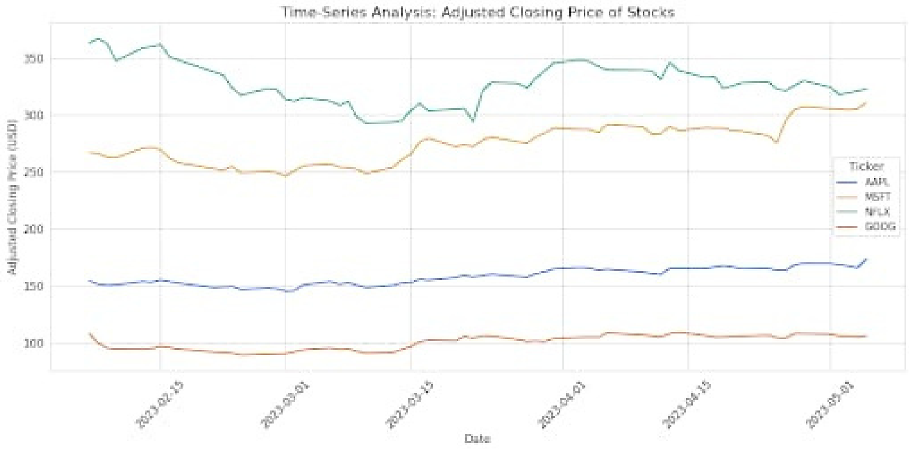
```
# stock_dashboard.py
import pandas as pd
import yfinance as yf
import plotly.express as px
import streamlit as st
import matplotlib.pyplot as plt
import seaborn as sns
from datetime import date

# Page configuration
st.set_page_config(page_title="Stock Market Analysis Dashboard", layout="wide")
```

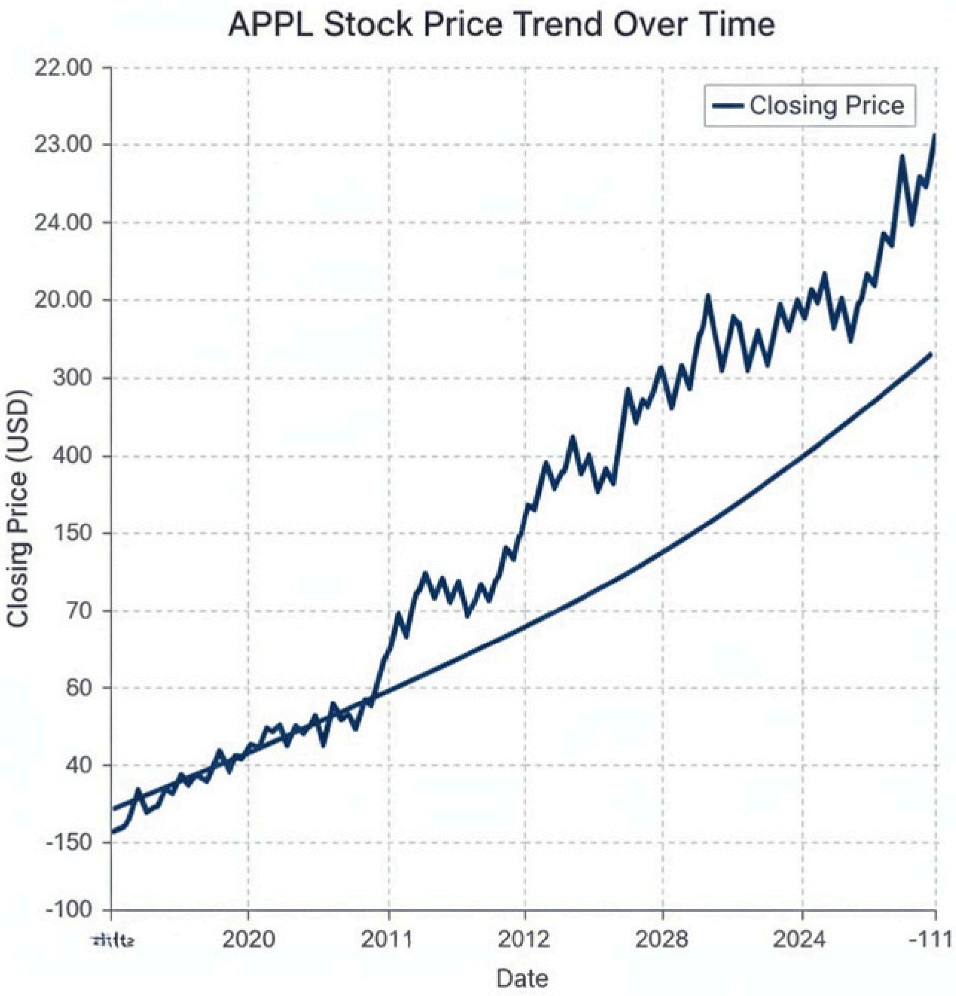
```
# Page configuration
st.set_page_config(page_title="Stock Market Analysis Dashboard", layout="wide")

# Title
st.title("📈 Stock Market Analysis Dashboard (Interactive & Real-time)")

# Sidebar filters
st.sidebar.header("🧭 Filters (Real-time)")
ticker = st.sidebar.text_input("Enter Stock Symbol (e.g., AAPL, TSLA, INFY.NS)", "AAPL")
start_date = st.sidebar.date_input("Start Date", date(2020, 1, 1))
end_date = st.sidebar.date_input("End Date", date.today())

# Load Data
df = yf.download(ticker, start=start_date, end=end_date)
df.reset_index(inplace=True)

# Feature 1: Price Trend
st.subheader("📊 Stock Price Trend")
fig = px.line(df, x="Date", y="Close", title=f"{ticker} Closing Price Over Time")
st.plotly_chart(fig, use_container_width=True)

# Feature 2: Candlestick Chart
st.subheader("💹 Candlestick Chart")
fig = px.candlestick(df, x="Date", open="Open", high="High", low="Low", close="Close",
                     title=f"{ticker} Candlestick Chart")
st.plotly_chart(fig, use_container_width=True)

# Feature 3: Moving Averages
st.subheader("📈 Moving Averages (20 & 50 Days)")
df["MA20"] = df["Close"].rolling(window=20).mean()
df["MA50"] = df["Close"].rolling(window=50).mean()
fig = px.line(df, x="Date", y=["Close", "MA20", "MA50"],
              title="Moving Averages Comparison")
st.plotly_chart(fig, use_container_width=True)

# Feature 4: Daily Returns
st.subheader("📉 Daily Returns")
df["Daily Return"] = df["Close"].pct_change()
fig = px.line(df, x="Date", y="Daily Return", title="Daily Return Trend")
st.plotly_chart(fig, use_container_width=True)
```

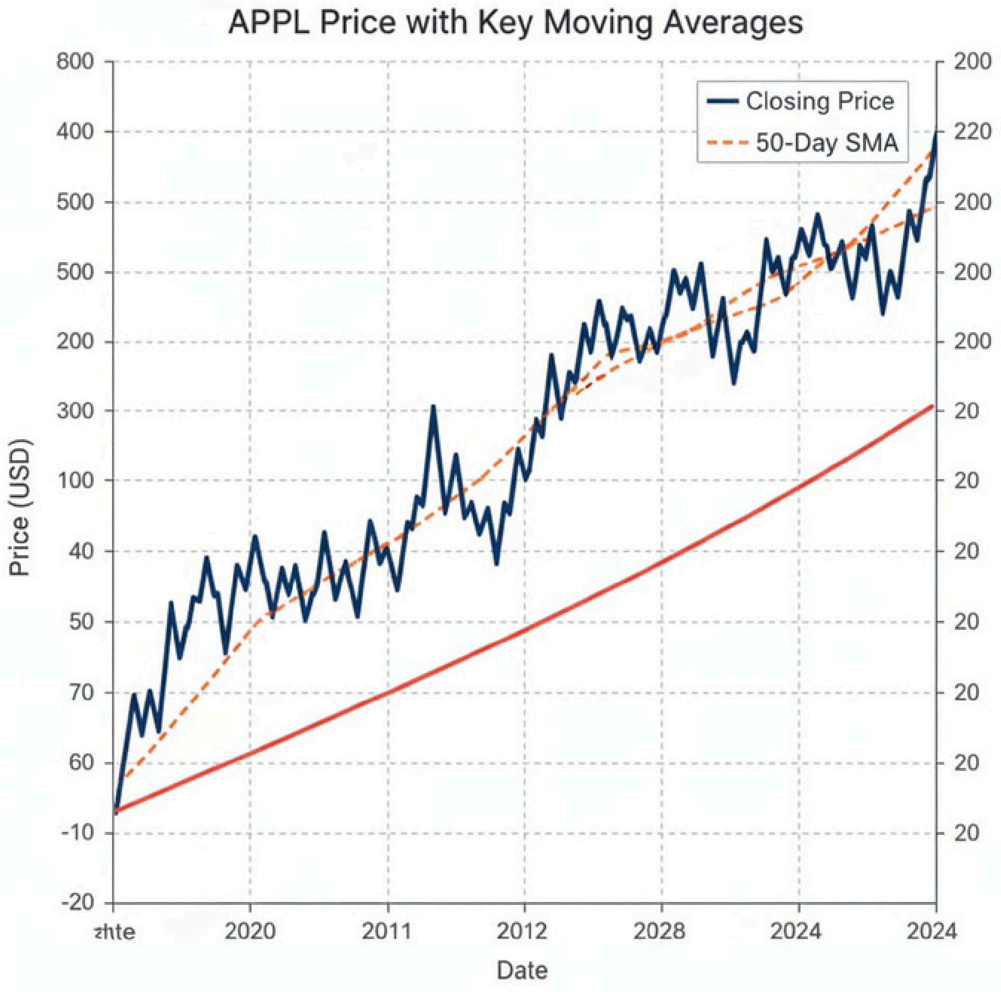
```
# Feature 5: Volume Analysis
st.subheader("📦 Trading Volume")
fig = px.bar(df, x="Date", y="Volume", title="Daily Trading Volume")
st.plotly_chart(fig, use_container_width=True)

# Feature 6: Correlation Heatmap (for multiple stocks)
st.subheader("🔗 Stock Correlation Heatmap")
selected_stocks = ["AAPL", "MSFT", "GOOG", "AMZN"]
data = yf.download(selected_stocks, start=start_date, end=end_date)["Close"]
corr = data.corr()
fig, ax = plt.subplots(figsize=(8, 6))
sns.heatmap(corr, annot=True, cmap="coolwarm", ax=ax)
st.pyplot(fig)

# Feature 7: Cumulative Returns
st.subheader("💰 Cumulative Returns")
df["Cumulative Return"] = (1 + df["Daily Return"]).cumprod()
fig = px.line(df, x="Date", y="Cumulative Return", title="Cumulative Return Over Time")
st.plotly_chart(fig, use_container_width=True)

st.success("✅ Real-time Stock Market Analysis Completed Successfully!")
```

OUTPUT:




Time-Series Analysis: Adjusted Closing Price of Stocks
Adjusted Closing Price (USD)
350
300
250
200
150
100
2023-02-15
2023-03-01
2023-03-15
2023-04-01
2023-04-15
2023-05-01
Date
Ticker
AAPL
MSFT
NFLX
GOOG


APPL Stock Price Trend Over Time
Closing Price
Closing Price (USD)
22.00
23.00
24.00
20.00
300
400
150
70
60
40
-150
-100
2020
2011
2012
2028
2024
-111
Date



RESULT

The project successfully analyzed and visualized stock market data in real-time.

It helps investors track price movements, identify trends, and make data-driven investment decisions using modern visualization and analysis techniques.