A. Installation, libraries, funcitons and global variables.

In [ ]:
```
# install alpaca library
!pip install alpaca-trade-api -q
```

```
     ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 50.1/50.1 kB 3.3 MB/s eta 0:00:00
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```

In [ ]:
```
# Load libraries required
import os
from datetime import datetime, timedelta, date, timezone
import pytz
from alpaca_trade_api.rest import REST, TimeFrame
import alpaca_trade_api as alpaca
import numpy as np
import pandas as pd
from google.colab import drive
import cvxopt as opt #Markowitz Portfolio Optimization
from cvxopt import matrix, blas, solvers #Markowitz Portfolio Optimization
from scipy.optimize import minimize #Markowitz Portfolio Optimization
import matplotlib.pyplot as plt
import seaborn as sns
from scipy import stats
from scipy.stats import yeojohnson
from typing import Union
```

In [ ]:
```
# Connect with Alpaca library
# Include your API_KEY, data included here is dummy data
API_KEY = '01234567890123456789'
SECRET_KEY = 'abcdefghijklmnopqrstuvwxy0123456789a0b2c'
api = alpaca.REST(API_KEY, SECRET_KEY, 'https://paper-api.alpaca.markets', api_vers
```

In [ ]:
```
# Define working folders
# Include your local drive or google drive information
# If you run this in collab, it will require your manual interventio to authenticat

collab_location='/content/gdrive/MyDrive/'
local_location='/content/drive/MyDrive/'
drive.mount('/content/drive')
```

```
Mounted at /content/drive
```

In [ ]:
```
# Define general variables

# Format to see the numbers
significant_numbers=3
instr='%.'+str(significant_numbers)+'g'
date_format='%Y-%m-%d %H:%M:%S'
```

```
# Tickers depending the market index
# List of stock market indices: https://en.wikipedia.org/wiki/List_of_stock_market_
# Dow Jones Global Titans 50: https://en.wikipedia.org/wiki/Dow_Jones_Global_Titans

# DJ Titanic Global 50
tickers_DJT=['MMM','ABBV','ALV','GOOG','GOOGL','AMZN','AMGN','BUD','AAPL','BHP','BA
# DJ Industrial
tickers_DJI=['MMM','AXP','AMGN','AMZN','AAPL','BA','CAT','CVX','CSCO','KO','DIS','D
# All DJ
tickers_DJ=['AAPL','ABBV','ALV','AMGN','AMZN','AXP','BA','BHP','BP','BTI','BUD','C'
```

In [ ]:
```
# Paramaters to download the information

# Choose between DJT (Titanic Global), DJI (Industrial) or DJ (All)
list_tickers='DJ'
if list_tickers=="DJT":
  tickers=tickers_DJT
elif list_tickers=='DJI':
  tickers=tickers_DJI
else:
  tickers=tickers_DJ

days_datasource=120
start_datasource=date.today() - timedelta(days=days_datasource)
time_frame='15Min'

# Keep the data only if it contains acceptable_data of data as minimum
acceptable_data=0.7

# Define the risk free rate to calculate the Sharpe ratio
risk_free_rate=0.0

# Define parameters for optimization
N = 5000  # Number of points in the plot
mus = [10**(5.0 * t/N - 1.0) for t in range(N)]
```

In [ ]:
```
# Dictionary for step mapping
step_mapping = {
    "Minutes": lambda x: timedelta(minutes=int(x)),
    "Hours": lambda x: timedelta(hours=int(x)),
    "Days": lambda x: timedelta(days=int(x))
}
```

In [ ]:
```
# Define option type and pryice_type
option_type=['static','variable']
price_type=['open','close']
```

In [ ]:
```
# Define the range of time you want to select
start_time = datetime.strptime('14:30:00', '%H:%M:%S').time()

# Set the end time based on the condition
end_time = datetime.strptime('21:00:00', '%H:%M:%S').time() if list_tickers == "DJT
```

In [ ]:
```
# Define weekdays, attempts to find a value and columns that needs to be exception
WEEKDAYS = range(5)  # Monday to Friday
attempts=1000
except_columns=['Sharpe Ratio', 'Returns', 'Volatility']
```

In [ ]:
```
# Define variables to storage the results and summary of all tests
results=[]
results_row = []

summary=[]
summary_row = []
```

In [ ]:

In [ ]:

A1. Functions

In [ ]:
```
# DATA QUALITY REPORT function for missing values, correlation and important inform
# Script provided by Dr. Jose Mario Zarate and adjusted for this script

def dqr(data):

    cols = pd.DataFrame(list(data.columns.values),
                        columns=['Name'],
                        index=list(data.columns.values))
    dtyp = pd.DataFrame(data.dtypes,columns=['Type'])
    misval = pd.DataFrame(data.isnull().sum(),columns=['N/A value'])
    nanval = pd.DataFrame(data.isna().sum(),columns=['Nan value'])
    infval = pd.DataFrame(columns=['Inf values'])
    presval = pd.DataFrame(data.count(),
                                columns=['Count values'])
    unival = pd.DataFrame(columns=['Unique values'])
    minval = pd.DataFrame(data.min(),columns=['Min'])
    maxval = pd.DataFrame(data.max(),columns=['Max'])
    IQRminval = pd.DataFrame(columns=['IQR Min'])
    IQRmaxval = pd.DataFrame(columns=['IQR Max'])
    IQRnum = pd.DataFrame(columns=['IQR Num'])
    mean =pd.DataFrame(data.mean(), columns=['Mean'])
    Std =pd.DataFrame(data.std(), columns=['Std'])
    Var =pd.DataFrame(data.var(), columns=['Var'])
    median =pd.DataFrame(data.median(), columns=['Median'])

    # Skew <0 left bias, >0 Right bias
    skewness = pd.DataFrame(data.skew(), columns=['Skewness'])
    # Kurt <1.2 flatten than Gaussian, >1.2 pointed than Gaussian
    kurtosis = pd.DataFrame(data.kurtosis(), columns=['Kurtosis'])

    for col in list(data.columns.values):
        unival.loc[col] = [data[col].nunique()]
        try:
            infval.loc[col] = np.isinf(data[col]).sum()
            lmin, lmax = find_boundaries(data[col])
```

```
            outliers_iqr = np.where((data[col] < lmin) | (data[col] > lmax), True,
            IQRminval.loc[col]=lmin
            IQRmaxval.loc[col]=lmax
            IQRnum.loc[col] = outliers_iqr.sum()
            minval.loc[col] = [data[col].min()]
            maxval.loc[col] = [data[col].max()]
        except:
            pass


    # Join all tables
    return cols.join(dtyp).join(misval).join(nanval).join(infval).join(presval).joi
```

In [ ]:
```
# Function defined to make sure every datetime used will be a valid datetime, betwe
# First if added to exclude holidays from the selection of the dates, line changed

def next_valid_datetime(dt: datetime) -> datetime:
    # Check if dt is a holiday and adjust to the next day if so
    if dt.date() in holidays['Holidays'].dt.date.values:
        dt += timedelta(days=1)

    # Helper function to get the next valid weekday
    def get_next_weekday(date: datetime) -> datetime:
        while date.weekday() not in WEEKDAYS:
            date += timedelta(days=1)
        return date

    # Move to next weekday if outside of weekdays
    dt = get_next_weekday(dt)

    # Check if within valid trading hours
    if not (start_time <= dt.time() <= end_time):
        if dt.time() > end_time:  # After trading hours
            dt += timedelta(days=1)
            dt = get_next_weekday(dt)
            dt = datetime(dt.year, dt.month, dt.day, start_time.hour, start_time.mi
        else:  # Before trading hours
            dt = datetime(dt.year, dt.month, dt.day, start_time.hour, start_time.mi

    return dt
```

In [ ]:
```
# Define a function to create the table that contains all different valid time rang
def invest_table(
    start_date: datetime,
    end_date: datetime,
    step: Union[timedelta, None],
    option: str
) -> pd.DataFrame:

    if option not in {'static', 'variable'}:
        raise ValueError(f"Invalid option: {option}. Choose 'static' or 'variable'.

    invest_time_ranges = []

    new_start_datetime = next_valid_datetime(start_date)
```

```
    new_end_datetime = next_valid_datetime(end_date)
    current_dt = new_start_datetime
    end_date = new_end_datetime


    if option == 'static':
        invest_time_ranges.append([new_start_datetime, new_end_datetime])
    elif option == 'variable':
        while current_dt < end_date:
            new_start_datetime = next_valid_datetime(current_dt)
            new_end_datetime = next_valid_datetime(new_start_datetime + step)

            if new_start_datetime <= end_date:
              invest_time_ranges.append([new_start_datetime, new_end_datetime])
            current_dt = new_start_datetime + step

    # Convert list to DataFrame for output
    return pd.DataFrame(invest_time_ranges, columns=['Start time', 'End Time'])
```

In [ ]:
```
# Define objective function to minimize (negative Sharpe Ratio)
def negative_sharpe_ratio(weights, mean_returns, cov_matrix, risk_free_rate=0.02):
  # portfolio_return = np.dot(weights, mean_returns)
  # portfolio_volatility = np.sqrt(np.dot(weights.T, np.dot(cov_matrix, weights)))
  # sharpe_ratio = (portfolio_return - risk_free_rate) / portfolio_volatility
  # return -sharpe_ratio  # Negative for minimization

  portfolio_return = np.sum(mean_returns * weights)
  portfolio_volatility = np.sqrt(np.dot(weights.T, np.dot(cov_matrix, weights)))
  sharpe_ratio = -(portfolio_return - risk_free_rate) / portfolio_volatility

  return sharpe_ratio  # Negative for minimization
```

In [ ]:
```
# Define constraint function (weights must sum to 1)
def weight_constraint(weights):
  return np.sum(weights) - 1
```

In [ ]:
```
# Select the top tickers using the minimize function (knowing it will not converge)
# Default tickers selected is 10
# Default risk free rate is 0.02

def select_tickers(data, num_top_tickers=10, risk_free_rate=0.02):

  # Calculate mean returns and covariance matrix
  mean_returns = data.mean()
  cov_matrix = data.cov()

  # Initialize equal weights
  initial_weights = np.full(len(mean_returns), 1 / len(mean_returns))
  bounds = [(0, 1)] * len(mean_returns)
  constraints = {'type': 'eq', 'fun': weight_constraint}

  # Optimize to maximize Sharpe Ratio (minimize negative Sharpe Ratio)
  result = minimize(
      negative_sharpe_ratio,
      initial_weights,
```

```
        args=(mean_returns, cov_matrix, risk_free_rate),
        bounds=bounds,
        constraints=constraints
    )

    # Extract and sort the tickers by optimized weights
    optimized_weights = result.x
    top_tickers_indices = np.argsort(optimized_weights)[-num_top_tickers:][::-1]
    top_tickers = data.columns[top_tickers_indices].tolist()

    return top_tickers
```

In [ ]:

```
# Markowitx fucntion to calcualte the optimal weights for the top tickers
# Script found in internet https://github.com/aghanhussain/Markowitz-Portfolio-Opti
# Adjusted as required

def calculate_optimal_weights(data, selected_tickers, num_portfolios, target_return

    # Filter data for selected tickers
    mean_returns = data[selected_tickers].mean()
    cov_matrix = data[selected_tickers].cov()

    # Convert covariance matrix and mean returns to cvxopt matrices
    S = matrix(cov_matrix.values)
    pbar = matrix(mean_returns.values)

    n = len(mean_returns)
    P = S  # Covariance matrix
    q = matrix(np.zeros(n))  # Zero mean
    G = matrix(-np.eye(n))  # Negative identity matrix for inequality constraints
    h = matrix(np.zeros(n))  # Zero lower bounds for weights
    A = matrix(1.0, (1, n))  # Equality constraint: sum of weights = 1
    b = matrix(1.0)  # Equality constraint value

    # Suppress solver output
    solvers.options['show_progress'] = False

    # sol = solvers.qp(P, q, G, h, A, b)

    # Calculate weights for the efficient frontier portfolios
    portfolios = [solvers.qp(mu * P, -pbar, G, h, A, b)['x'] for mu in target_retur

    # Extract weights, returns, and volatility for each portfolio
    weights_df = pd.DataFrame([np.array(w).flatten() for w in portfolios], columns=
    returns = [blas.dot(pbar, x) for x in portfolios]
    volatility = [np.sqrt(blas.dot(x, S * x)) for x in portfolios]

    # Construct DataFrame for portfolio performance
    portfolio_data = pd.DataFrame({
        'Returns': returns,
        'Volatility': volatility,
        'Sharpe Ratio': (np.array(returns) - risk_free_rate) / np.array(volatility)
    })

    # Add weights to the portfolio data
    portfolio_data = pd.concat([weights_df, portfolio_data], axis=1)
```

```
    # Identify the optimal portfolio with the maximum Sharpe Ratio
    optimal_portfolio_index = portfolio_data['Sharpe Ratio'].idxmax()
    optimal_portfolio = portfolio_data.iloc[optimal_portfolio_index]

    return optimal_portfolio
```

In [ ]:

In [ ]:

In [ ]:
```
# Get the prices for each ticker using the datetimes provided

def add_prices_to_portfolio(data, date, sel_tickers, label, step, attempts):

    # Ensure 'Datetime' is in datetime format
    data['Datetime'] = pd.to_datetime(data['Datetime'])

    # Select rows where the Datetime matches the specified date
    new_df = data[data['Datetime'] == date][['Datetime'] + sel_tickers].copy()

    if new_df.empty:
        print(f"No data found for the date: {date}")
        return pd.DataFrame(columns=['Datetime'] + sel_tickers)

    # Generate new column name from the first Datetime value
    new_label = f"{new_df.iloc[0, 0].to_pydatetime()} {label}"
    # Rename the first column to 'Symbol' and set it as index
    new_df['Datetime']=new_df['Datetime'].astype(str)
    new_df.columns = ['Symbol'] + new_df.columns.tolist()[1:]
    # Update the first entry in the Symbol column with the new label
    new_df.iloc[0, 0] = new_label
    # Reset index and transpose the DataFrame
    new_df = new_df.reset_index(drop=True).set_index('Symbol').T

    return new_df
```

In [ ]:
```
# Function defined to simulate when buying a certain stock at a certain datetime
def buying_stock(stock_identifier,dt, df_ref, i, amount):

    extra_investment = 0
    weight_col = f"{stock_identifier} - weight"
    open_price_col = f"{stock_identifier} - open price"

    # Sort values by weight column
    dt.sort_values(by=weight_col, ascending=False, inplace=True) # Ascending

    # Initialize new investment-related columns
    investment_cols = ['Non variable Investment', 'Investment', 'Initial investment
                       'Initial investment', 'Actual investment', 'Remainder']

    for col in investment_cols:
        dt[f"{stock_identifier} - {col}"] = 0.0

    for row_name in dt.index:
```

```
        if row_name not in ['Returns', 'Volatility', 'Sharpe Ratio'] and not pd.isna(
            weight = dt.loc[row_name, weight_col]
            open_price = dt.loc[row_name, open_price_col]

            # Calculate various forms of investment
            non_variable_investment = weight * amount
            investment = non_variable_investment + extra_investment
            initial_investment_unrounded = investment / open_price
            initial_investment = investment // open_price  # Floor division

            # initial_investment = math.ceil(investment / open_price) # Ceiling divisio
            actual_investment = initial_investment * open_price

            # Calculate the remaining extra investment
            extra_investment = investment - actual_investment

            # Update the DataFrame
            dt.at[row_name, f"{df_ref.iloc[i,0]} - Non variable Investment"] = non_vari

            dt.at[row_name, f"{df_ref.iloc[i,0]} - Investment"] = investment
            dt.at[row_name, f"{df_ref.iloc[i,0]} - Initial investment (not rounded)"] =
            dt.at[row_name, f"{df_ref.iloc[i,0]} - Initial investment"] = initial_inves
            dt.at[row_name, f"{df_ref.iloc[i,0]} - Actual investment"] = actual_investm
            dt.at[row_name, f"{df_ref.iloc[i,0]} - Remainder"] = extra_investment

    return extra_investment
```

In [ ]:

In [ ]:

B. Read all data

In [ ]:
```
# Upload holidays for NYSE, days which NSYE is close and as such there is no data t
# We will exclude these days from the tests
# Reference: https://www.nyse.com/markets/hours-calendars

holidays = pd.read_excel(local_location+'NYSE Holidays.xlsx')
holidays['Holidays'] = pd.to_datetime(holidays['Holidays'])
holidays
```

Out[ ]:

	Holidays
0	2024-01-01
1	2024-01-15
2	2024-02-19
3	2024-03-29
4	2024-05-27
5	2024-06-19
6	2024-07-04
7	2024-09-02
8	2024-11-28
9	2024-12-25
10	2025-01-01
11	2025-01-20
12	2025-02-17
13	2025-04-18
14	2025-05-26
15	2025-06-19
16	2025-07-04
17	2025-09-01
18	2025-11-27
19	2025-12-25
20	2026-01-01
21	2026-01-19
22	2026-02-16
23	2026-04-03
24	2026-05-25
25	2026-06-19
26	2026-07-03
27	2026-09-07
28	2026-11-26
29	2025-12-25

In [ ]:
```
# Download the data based on parameter defined

df_all = api.get_bars(tickers, start=start_datasource, timeframe=time_frame, adjust
df_all
```

Out[ ]:

timestamp	close	high	low	trade_count	open	volume	vwap	symb
2024-07-08 08:00:00+00:00	226.99	227.6000	226.61	882	227.6000	18771	227.025095	AA
2024-07-08 08:15:00+00:00	227.56	227.5600	226.90	462	226.9900	14662	227.256889	AA
2024-07-08 08:30:00+00:00	227.45	227.5700	227.14	539	227.5700	19385	227.340711	AA
2024-07-08 08:45:00+00:00	227.50	227.5200	227.43	215	227.5200	8561	227.495326	AA
2024-07-08 09:00:00+00:00	227.39	227.4500	227.29	195	227.3600	6211	227.362951	AA
...	...	...	...	...	...	...	...	
2024-11-01 22:00:00+00:00	114.95	115.0825	114.79	60	114.8500	4807	114.865993	XC
2024-11-01 22:30:00+00:00	114.97	114.9900	114.97	7	114.9800	1149	114.984276	XC
2024-11-01 22:45:00+00:00	114.95	115.0787	114.95	26	115.0787	3602	114.999501	XC
2024-11-01 23:00:00+00:00	115.01	115.0100	115.01	2	115.0100	200	115.010000	XC
2024-11-01 23:45:00+00:00	115.02	115.0300	114.95	33	115.0300	5159	115.018098	XC

220562 rows × 8 columns

In [ ]:
```
# Read the file that contains all the scenarios and set the pare

test_filename = 'Scenarios'
tests = pd.read_excel(local_location + test_filename + '.xlsx')
tests
```

Out[ ]:

	Start datetime	End datetime	Step	Step type	Tickers	Investment
0	2024-10-18 14:30:00	2024-10-18 17:30:00	15	Minutes	15	1000000
1	2024-10-18 14:30:00	2024-10-18 17:30:00	30	Minutes	15	1000000
2	2024-10-18 14:30:00	2024-10-18 17:30:00	1	Hours	15	1000000
3	2024-10-18 14:30:00	2024-10-18 17:30:00	2	Hours	15	1000000
4	2024-10-18 14:30:00	2024-10-18 17:30:00	3	Hours	15	1000000
5	2024-10-18 14:30:00	2024-10-18 17:30:00	4	Hours	15	1000000
6	2024-10-18 14:30:00	2024-10-18 17:30:00	5	Hours	15	1000000
7	2024-10-18 14:30:00	2024-10-21 14:30:00	15	Minutes	15	1000000
8	2024-10-18 14:30:00	2024-10-21 14:30:00	30	Minutes	15	1000000
9	2024-10-18 14:30:00	2024-10-21 14:30:00	1	Hours	15	1000000
10	2024-10-18 14:30:00	2024-10-21 14:30:00	2	Hours	15	1000000
11	2024-10-18 14:30:00	2024-10-21 14:30:00	3	Hours	15	1000000
12	2024-10-18 14:30:00	2024-10-21 14:30:00	4	Hours	15	1000000
13	2024-10-18 14:30:00	2024-10-21 14:30:00	5	Hours	15	1000000
14	2024-10-18 14:30:00	2024-10-22 14:30:00	2	Hours	15	1000000
15	2024-10-18 14:30:00	2024-10-23 14:30:00	2	Hours	15	1000000
16	2024-10-18 14:30:00	2024-10-24 14:30:00	2	Hours	15	1000000
17	2024-10-21 14:30:00	2024-10-25 14:30:00	2	Hours	15	1000000
18	2024-10-21 14:30:00	2024-10-26 14:30:00	2	Hours	15	1000000
19	2024-10-21 14:30:00	2024-10-27 14:30:00	2	Hours	15	1000000
20	2024-10-21 14:30:00	2024-10-28 14:30:00	2	Hours	15	1000000
21	2024-10-21 14:30:00	2024-10-29 14:30:00	2	Hours	15	1000000
22	2024-10-21 14:30:00	2024-10-30 14:30:00	2	Hours	15	1000000
23	2024-10-21 14:30:00	2024-10-31 14:30:00	2	Hours	15	1000000

In [ ]:

In [ ]:

In [ ]:

C. Data quality and preparation

C1. Prepare open price data

In [ ]:
```
# Separate the dataframes for open
df_open=df_all.copy()
```

In [ ]:
```
# Drop all unnecesary columns
df_open.drop(['close','high','low','trade_count','volume','vwap'], axis=1, inplace=
df_open
```

Out[ ]:

timestamp	open	symbol
2024-07-08 08:00:00+00:00	227.6000	AAPL
2024-07-08 08:15:00+00:00	226.9900	AAPL
2024-07-08 08:30:00+00:00	227.5700	AAPL
2024-07-08 08:45:00+00:00	227.5200	AAPL
2024-07-08 09:00:00+00:00	227.3600	AAPL
...	...	...
2024-11-01 22:00:00+00:00	114.8500	XOM
2024-11-01 22:30:00+00:00	114.9800	XOM
2024-11-01 22:45:00+00:00	115.0787	XOM
2024-11-01 23:00:00+00:00	115.0100	XOM
2024-11-01 23:45:00+00:00	115.0300	XOM

220562 rows × 2 columns

In [ ]:
```
# Reshape df_open to have tickers as columns and dates as indexes
prices_open = df_open.reset_index()
prices_open = prices_open.dropna(subset=['open'])
prices_open = prices_open.pivot_table(index='timestamp', columns='symbol', values='
prices_open = prices_open.ffill()
prices_open
```

Out[ ]:

symbol	AAPL	ABBV	ALV	AMGN	AMZN	AXP	BA	BHP	BI
timestamp									
2024-07-08 08:00:00+00:00	227.6000	NaN	108.45	NaN	200.0700	235.19	185.0000	58.78	36.740
2024-07-08 08:15:00+00:00	226.9900	NaN	108.29	NaN	200.0900	235.19	185.1200	58.78	36.740
2024-07-08 08:30:00+00:00	227.5700	NaN	107.88	NaN	200.2100	235.19	185.1200	58.78	36.740
2024-07-08 08:45:00+00:00	227.5200	NaN	108.13	NaN	200.1800	235.19	185.1200	58.78	36.740
2024-07-08 09:00:00+00:00	227.3600	NaN	108.13	NaN	200.2200	235.19	185.7000	58.79	36.560
...	...	...	...	...	...	...	...	...	.
2024-11-01 22:45:00+00:00	222.8900	203.55	95.17	320.3	197.3015	272.72	154.5600	56.05	29.270
2024-11-01 23:00:00+00:00	222.8900	203.55	95.17	320.3	197.1100	272.75	154.7092	56.05	29.260
2024-11-01 23:15:00+00:00	222.8400	203.55	95.17	320.3	197.2866	272.75	154.7500	56.05	29.260
2024-11-01 23:30:00+00:00	222.8694	203.55	95.17	320.3	197.1300	272.75	154.8500	56.05	29.240
2024-11-01 23:45:00+00:00	222.6200	203.55	95.17	320.3	197.0300	272.75	154.8000	56.05	29.234

5376 rows × 60 columns

In [ ]:
```
# Review for tickers with nulls for open
# acceptable_data will be using >=70% of the data needs to have a value else will b

# Calculate the total number of rows
total_rows = len(prices_open)

# Calculate the percentage of non-NaN values for each column
non_nan_percentage = prices_open.count() / total_rows

# Identify columns with insufficient data
drop_columns = non_nan_percentage[non_nan_percentage < acceptable_data].index.tolis

# Display the columns that will be dropped
for col in drop_columns:
    print(f'{col} will be deleted as it has {non_nan_percentage[col]:.2f}% data, be

# Drop all columns that don't meet the threshold
prices_open = prices_open.drop(columns=drop_columns)
```

```
# Update the list of tickers
tickers_open = list(set(tickers) - set(drop_columns))

# Check the number of remaining tickers
len(tickers_open)
```

Out[ ]: 62

In [ ]:
```
# Convert 'timestamp' to datetime without timezone
prices_open = prices_open.reset_index()
prices_open['Datetime'] = pd.to_datetime(prices_open['timestamp'], utc=True).dt.tz_
prices_open
```

Out[ ]:

symbol	timestamp	AAPL	ABBV	ALV	AMGN	AMZN	AXP	BA	BHP
0	2024-07-08 08:00:00+00:00	227.6000	NaN	108.45	NaN	200.0700	235.19	185.0000	58.78
1	2024-07-08 08:15:00+00:00	226.9900	NaN	108.29	NaN	200.0900	235.19	185.1200	58.78
2	2024-07-08 08:30:00+00:00	227.5700	NaN	107.88	NaN	200.2100	235.19	185.1200	58.78
3	2024-07-08 08:45:00+00:00	227.5200	NaN	108.13	NaN	200.1800	235.19	185.1200	58.78
4	2024-07-08 09:00:00+00:00	227.3600	NaN	108.13	NaN	200.2200	235.19	185.7000	58.79
...	...	...	...	...	...	...	...	...	...
5371	2024-11-01 22:45:00+00:00	222.8900	203.55	95.17	320.3	197.3015	272.72	154.5600	56.05
5372	2024-11-01 23:00:00+00:00	222.8900	203.55	95.17	320.3	197.1100	272.75	154.7092	56.05
5373	2024-11-01 23:15:00+00:00	222.8400	203.55	95.17	320.3	197.2866	272.75	154.7500	56.05
5374	2024-11-01 23:30:00+00:00	222.8694	203.55	95.17	320.3	197.1300	272.75	154.8500	56.05
5375	2024-11-01 23:45:00+00:00	222.6200	203.55	95.17	320.3	197.0300	272.75	154.8000	56.05

5376 rows × 62 columns

In [ ]:
```
# Drop the original 'timestamp' column
prices_open.drop(['timestamp'], axis=1, inplace=True)

# Reset the index to clean up the DataFrame if needed (depends on use case)
prices_open.reset_index(drop=True, inplace=True)

prices_open
```

Out[ ]:

symbol	AAPL	ABBV	ALV	AMGN	AMZN	AXP	BA	BHP	BP	BTI
0	227.6000	NaN	108.45	NaN	200.0700	235.19	185.0000	58.78	36.7400	31.73
1	226.9900	NaN	108.29	NaN	200.0900	235.19	185.1200	58.78	36.7400	31.65
2	227.5700	NaN	107.88	NaN	200.2100	235.19	185.1200	58.78	36.7400	31.67
3	227.5200	NaN	108.13	NaN	200.1800	235.19	185.1200	58.78	36.7400	31.67
4	227.3600	NaN	108.13	NaN	200.2200	235.19	185.7000	58.79	36.5600	31.62
...	...	...	...	...	...	...	...	...	...	...
5371	222.8900	203.55	95.17	320.3	197.3015	272.72	154.5600	56.05	29.2700	35.09
5372	222.8900	203.55	95.17	320.3	197.1100	272.75	154.7092	56.05	29.2600	35.09
5373	222.8400	203.55	95.17	320.3	197.2866	272.75	154.7500	56.05	29.2600	35.12
5374	222.8694	203.55	95.17	320.3	197.1300	272.75	154.8500	56.05	29.2400	35.24
5375	222.6200	203.55	95.17	320.3	197.0300	272.75	154.8000	56.05	29.2345	35.24

5376 rows × 61 columns

In [ ]:

```
# Filter rows based on the time range in a vectorized way
clean_prices_open = prices_open[(prices_open['Datetime'].dt.time >= start_time) & (

# Create a copy for later use with 'Datetime' column and drop the 'Datetime' column
clean_prices_open_wdatetime = clean_prices_open.copy()
clean_prices_open.drop(['Datetime'], axis=1, inplace=True)

# Convert the remaining columns to float
clean_prices_open = clean_prices_open.astype(float)
```

```
clean_prices_open
```

Out[ ]:

symbol	AAPL	ABBV	ALV	AMGN	AMZN	AXP	BA	BHP	BP	
26	225.1998	167.670	108.580	313.8050	199.97	236.14	190.3654	58.510	36.6450	31
27	225.1900	167.215	108.540	313.7850	199.70	236.84	191.1450	58.370	36.6900	31
28	225.4300	167.410	108.520	314.0800	199.76	237.22	190.6200	58.360	36.6250	31
29	226.2500	166.830	108.590	313.1600	199.68	236.87	190.4850	58.355	36.6100	31
30	226.5300	166.590	108.670	312.1301	199.99	236.15	189.2000	58.260	36.5800	31
...	...	...	...	...	...	...	...	...	...	
5356	222.5900	204.180	95.245	318.9400	198.34	273.17	154.6401	56.040	29.2550	35
5357	222.8900	204.545	95.230	318.7500	198.70	273.46	154.4600	56.090	29.2700	35
5358	222.3300	204.140	95.120	318.6600	197.82	273.19	153.9800	56.005	29.2387	34
5359	222.5700	203.825	95.140	319.3800	198.19	273.13	154.1700	56.015	29.2450	35
5360	222.9100	203.550	95.170	319.2200	197.88	272.69	154.6500	55.940	29.2300	35

1932 rows × 60 columns

In [ ]:

```
# Obtaining the data quality report
report = dqr(clean_prices_open)

# Saving to excel
file_name = 'Data_quality_clean_prices_open.xlsx'
report.to_excel(local_location + file_name)
report
```

Out[ ]:

	Name	Type	N/A value	Nan value	Inf values	Count values	Unique values	Min	Max	
AAPL	AAPL	float64	0	0	0	1932	1472	204.7900	236.6900	225.2
ABBV	ABBV	float64	0	0	0	1932	1442	166.0500	204.6900	189.3
ALV	ALV	float64	0	0	0	1932	1235	89.6090	111.2500	97.9
AMGN	AMGN	float64	0	0	0	1932	1557	307.1100	345.6100	325.6
AMZN	AMZN	float64	0	0	0	1932	1545	158.1850	200.2801	183.0
AXP	AXP	float64	0	0	0	1932	1675	225.9200	285.9575	256.3
BA	BA	float64	0	0	0	1932	1638	146.4450	196.7500	165.7
BHP	BHP	float64	0	0	0	1932	1166	50.9600	62.9600	55.8
BP	BP	float64	0	0	0	1932	1015	29.0100	36.6900	32.9
BTI	BTI	float64	0	0	0	1932	1018	31.5400	39.4250	35.7
BUD	BUD	float64	0	0	0	1932	975	59.0100	66.8200	62.6
C	C	float64	0	0	0	1932	1226	54.5750	67.7600	62.1
CAT	CAT	float64	0	0	0	1932	1716	314.2900	403.1650	359.0
CRM	CRM	float64	0	0	0	1932	1690	235.0625	300.3900	265.2
CSCO	CSCO	float64	0	0	0	1932	1286	44.7450	57.0050	50.4
CVX	CVX	float64	0	0	0	1932	1401	135.6900	164.1200	148.9
DD	DD	float64	0	0	0	1932	1149	76.6800	89.9450	82.4
DIS	DIS	float64	0	0	0	1932	1300	84.8100	98.6450	92.5
DOW	DOW	float64	0	0	0	1932	948	48.8700	55.8950	52.6
ENR	ENR	float64	0	0	0	1932	693	28.1900	32.9600	30.7
GE	GE	float64	0	0	0	1932	1568	154.6700	194.2300	174.1
GOOG	GOOG	float64	0	0	0	1932	1408	148.6700	193.1450	167.9
GOOGL	GOOGL	float64	0	0	0	1932	1464	147.6700	191.5801	166.4
GS	GS	float64	0	0	0	1932	1731	449.3850	534.7550	497.2
GSK	GSK	float64	0	0	0	1932	993	36.2600	44.2750	40.3
HD	HD	float64	0	0	0	1932	1741	336.1150	420.5500	378.1
HON	HON	float64	0	0	0	1932	1474	195.6900	222.6600	207.0
HSBC	HSBC	float64	0	0	0	1932	857	40.1700	47.0700	43.7
IBM	IBM	float64	0	0	0	1932	1700	174.9121	236.8300	204.9
INTC	INTC	float64	0	0	0	1932	1325	18.5250	36.1100	24.0

	Name	Type	N/A value	Nan value	Inf values	Count values	Unique values	Min	Max	
JNJ	JNJ	float64	0	0	0	1932	1204	145.3700	167.8800	160.6
JPM	JPM	float64	0	0	0	1932	1448	193.7800	226.1000	213.1
KO	KO	float64	0	0	0	1932	1174	62.3800	73.2350	68.8
MA	MA	float64	0	0	0	1932	1778	429.2300	517.7700	477.2
MCD	MCD	float64	0	0	0	1932	1681	243.7400	316.9550	284.8
META	META	float64	0	0	0	1932	1814	452.8200	599.8795	533.5
MMM	MMM	float64	0	0	0	1932	1402	98.4010	139.8700	126.2
MRK	MRK	float64	0	0	0	1932	1382	101.2900	129.7300	115.2
MSFT	MSFT	float64	0	0	0	1932	1684	393.5300	466.4100	423.5
NKE	NKE	float64	0	0	0	1932	1425	71.1400	90.1825	79.3
NVDA	NVDA	float64	0	0	0	1932	1725	98.7400	143.8300	122.5
NVS	NVS	float64	0	0	0	1932	1140	105.8200	120.8900	113.9
ORCL	ORCL	float64	0	0	0	1932	1511	125.9000	178.2900	152.9
PEP	PEP	float64	0	0	0	1932	1315	160.8700	179.4400	172.0
PFE	PFE	float64	0	0	0	1932	818	27.3300	31.4399	29.1
PG	PG	float64	0	0	0	1932	1193	159.3008	177.7900	169.9
PM	PM	float64	0	0	0	1932	1381	101.6700	133.3900	119.0
ROG	ROG	float64	0	0	0	1932	1357	96.4100	133.6300	109.1
RY	RY	float64	0	0	0	1932	1158	104.5700	126.8400	117.5
SAN	SAN	float64	0	0	0	1932	327	4.3200	5.1850	4.8
SHEL	SHEL	float64	0	0	0	1932	1067	64.5100	73.9400	69.7
TM	TM	float64	0	0	0	1932	1596	165.6100	208.7100	182.3
TRV	TRV	float64	0	0	0	1932	1660	203.0202	265.6400	228.3
TSM	TSM	float64	0	0	0	1932	1660	141.9100	212.2299	175.9
TTE	TTE	float64	0	0	0	1932	942	62.0050	70.4800	67.2
UNH	UNH	float64	0	0	0	1932	1700	486.5000	607.6900	572.3
V	V	float64	0	0	0	1932	1600	253.5123	293.7200	273.9
VZ	VZ	float64	0	0	0	1932	1049	38.7550	45.2100	42.1
WMT	WMT	float64	0	0	0	1932	1369	66.8750	83.3000	75.8
XOM	XOM	float64	0	0	0	1932	1240	107.8900	126.1900	117.0

In [ ]:

In [ ]:

C2. Prepare close price data

In [ ]:
```
# Separate the dataframes for close
df_close=df_all.copy()
```

In [ ]:
```
# So, we will keep df only with the close values
df_close.drop(['open','high','low','trade_count','volume','vwap'], axis=1, inplace=
df_close
```

Out[ ]:

timestamp	close	symbol
2024-07-08 08:00:00+00:00	226.99	AAPL
2024-07-08 08:15:00+00:00	227.56	AAPL
2024-07-08 08:30:00+00:00	227.45	AAPL
2024-07-08 08:45:00+00:00	227.50	AAPL
2024-07-08 09:00:00+00:00	227.39	AAPL
...	...	...
2024-11-01 22:00:00+00:00	114.95	XOM
2024-11-01 22:30:00+00:00	114.97	XOM
2024-11-01 22:45:00+00:00	114.95	XOM
2024-11-01 23:00:00+00:00	115.01	XOM
2024-11-01 23:45:00+00:00	115.02	XOM

220562 rows × 2 columns

In [ ]:
```
# Reshape df_open to have tickers as columns and dates as indexes
prices_close = df_close.reset_index()
prices_close = prices_close.dropna(subset=['close'])
prices_close = prices_close.pivot_table(index='timestamp', columns='symbol', values
prices_close = prices_close.ffill()
prices_close
```

Out[ ]:

symbol	AAPL	ABBV	ALV	AMGN	AMZN	AXP	BA	BHP	BP	
timestamp										
2024-07-08 08:00:00+00:00	226.99	NaN	108.34	NaN	200.0900	235.19	185.00	58.78	36.7500	3
2024-07-08 08:15:00+00:00	227.56	NaN	107.97	NaN	200.1500	235.19	185.12	58.78	36.7500	3
2024-07-08 08:30:00+00:00	227.45	NaN	108.24	NaN	200.2700	235.19	185.12	58.78	36.7500	3
2024-07-08 08:45:00+00:00	227.50	NaN	108.13	NaN	200.2100	235.19	185.12	58.78	36.7500	3
2024-07-08 09:00:00+00:00	227.39	NaN	108.13	NaN	200.2200	235.19	185.70	58.79	36.5700	3
...	...	...	...	...	...	...	...	...	...	
2024-11-01 22:45:00+00:00	222.93	203.55	95.15	320.3	197.1091	272.72	154.68	56.05	29.2700	3
2024-11-01 23:00:00+00:00	222.93	203.55	95.15	320.3	197.3000	272.75	154.72	56.05	29.2400	3
2024-11-01 23:15:00+00:00	222.81	203.55	95.15	320.3	197.2500	272.75	154.75	56.05	29.2400	3
2024-11-01 23:30:00+00:00	222.69	203.55	95.15	320.3	197.0200	272.75	154.75	56.05	29.2400	3
2024-11-01 23:45:00+00:00	222.68	203.55	95.15	320.3	197.0100	272.75	154.88	56.05	29.2345	3

5376 rows × 60 columns

In [ ]:
```
# Review for tickers with nulls for close
# acceptable_data will be using >=70% of the data needs to have a value else will b

# Calculate the total number of rows
total_rows = len(prices_close)

# Calculate the percentage of non-NaN values for each column
non_nan_percentage = prices_close.count() / total_rows

# Identify columns with insufficient data
drop_columns = non_nan_percentage[non_nan_percentage < acceptable_data].index.tolis

# Display the columns that will be dropped
for col in drop_columns:
    print(f'{col} will be deleted as it has {non_nan_percentage[col]:.2f}% data, be

# Drop all columns that don't meet the threshold
prices_close = prices_close.drop(columns=drop_columns)
```

```
# Update the list of tickers
tickers_close = list(set(tickers) - set(drop_columns))

# Check the number of remaining tickers
len(tickers_close)
```

Out[ ]: 62

In [ ]:
```
# Convert 'timestamp' to datetime without timezone
prices_close = prices_close.reset_index()
prices_close['Datetime'] = pd.to_datetime(prices_close['timestamp'], utc=True).dt.t
prices_close
```

Out[ ]:

symbol	timestamp	AAPL	ABBV	ALV	AMGN	AMZN	AXP	BA	BHP	
0	2024-07-08 08:00:00+00:00	226.99	NaN	108.34	NaN	200.0900	235.19	185.00	58.78	36.
1	2024-07-08 08:15:00+00:00	227.56	NaN	107.97	NaN	200.1500	235.19	185.12	58.78	36.
2	2024-07-08 08:30:00+00:00	227.45	NaN	108.24	NaN	200.2700	235.19	185.12	58.78	36.
3	2024-07-08 08:45:00+00:00	227.50	NaN	108.13	NaN	200.2100	235.19	185.12	58.78	36.
4	2024-07-08 09:00:00+00:00	227.39	NaN	108.13	NaN	200.2200	235.19	185.70	58.79	36.
...	...	...	...	...	...	...	...	...	...	
5371	2024-11-01 22:45:00+00:00	222.93	203.55	95.15	320.3	197.1091	272.72	154.68	56.05	29.
5372	2024-11-01 23:00:00+00:00	222.93	203.55	95.15	320.3	197.3000	272.75	154.72	56.05	29.
5373	2024-11-01 23:15:00+00:00	222.81	203.55	95.15	320.3	197.2500	272.75	154.75	56.05	29.
5374	2024-11-01 23:30:00+00:00	222.69	203.55	95.15	320.3	197.0200	272.75	154.75	56.05	29.
5375	2024-11-01 23:45:00+00:00	222.68	203.55	95.15	320.3	197.0100	272.75	154.88	56.05	29.

5376 rows × 62 columns

In [ ]:
```
# Drop the original 'timestamp' column
prices_close.drop(['timestamp'], axis=1, inplace=True)

# Reset the index to clean up the DataFrame if needed (depends on use case)
prices_close.reset_index(drop=True, inplace=True)

prices_close
```

Out[ ]:

symbol	AAPL	ABBV	ALV	AMGN	AMZN	AXP	BA	BHP	BP	BTI	...
0	226.99	NaN	108.34	NaN	200.0900	235.19	185.00	58.78	36.7500	31.70	...
1	227.56	NaN	107.97	NaN	200.1500	235.19	185.12	58.78	36.7500	31.65	...
2	227.45	NaN	108.24	NaN	200.2700	235.19	185.12	58.78	36.7500	31.68	...
3	227.50	NaN	108.13	NaN	200.2100	235.19	185.12	58.78	36.7500	31.67	...
4	227.39	NaN	108.13	NaN	200.2200	235.19	185.70	58.79	36.5700	31.62	...
...	...	...	...	...	...	...	...	...	...	...	...
5371	222.93	203.55	95.15	320.3	197.1091	272.72	154.68	56.05	29.2700	35.09	...
5372	222.93	203.55	95.15	320.3	197.3000	272.75	154.72	56.05	29.2400	35.09	...
5373	222.81	203.55	95.15	320.3	197.2500	272.75	154.75	56.05	29.2400	35.24	...
5374	222.69	203.55	95.15	320.3	197.0200	272.75	154.75	56.05	29.2400	35.08	...
5375	222.68	203.55	95.15	320.3	197.0100	272.75	154.88	56.05	29.2345	35.08	...

5376 rows × 61 columns

In [ ]:
```
# Filter rows based on the time range in a vectorized way
clean_prices_close = prices_close[(prices_close['Datetime'].dt.time >= start_time)

# Create a copy for later use with 'Datetime' column and drop the 'Datetime' column
clean_prices_close_wdatetime = clean_prices_close.copy()
clean_prices_close.drop(['Datetime'], axis=1, inplace=True)

# Convert the remaining columns to float
clean_prices_close = clean_prices_close.astype(float)
```

```
clean_prices_close
```

Out[ ]:

symbol	AAPL	ABBV	ALV	AMGN	AMZN	AXP	BA	BHP	BP	
26	225.200	167.215	108.485	313.6800	199.7068	236.820	191.130	58.370	36.6850	3
27	225.420	167.360	108.420	314.2800	199.7700	237.240	190.580	58.360	36.6300	3
28	226.250	166.880	108.565	313.1762	199.6650	236.910	190.500	58.350	36.6050	3
29	226.510	166.640	108.765	312.3500	199.9800	236.150	189.180	58.260	36.5800	3
30	226.830	166.290	108.200	311.6600	199.9600	234.955	188.025	58.230	36.4850	3
...	...	...	...	...	...	...	...	...	...	
5356	222.895	204.550	95.230	318.6801	198.7100	273.430	154.480	56.100	29.2650	3
5357	222.340	204.170	95.150	318.7150	197.8200	273.150	153.980	56.005	29.2350	3
5358	222.570	203.830	95.145	319.4400	198.2000	273.150	154.170	56.019	29.2479	3
5359	222.850	203.570	95.140	319.3190	197.8700	272.670	154.650	55.930	29.2350	3
5360	222.910	203.550	95.150	319.2200	197.9300	272.690	154.590	55.940	29.2700	3

1932 rows × 60 columns

In [ ]:

```
# Obtaining the data quality report
report = dqr(clean_prices_close)
report

# Saving to excel
file_name = 'Data_quality_clean_prices_close.xlsx'
report.to_excel(local_location + file_name)
report
```

Out[ ]:

	Name	Type	N/A value	Nan value	Inf values	Count values	Unique values	Min	Max	
AAPL	AAPL	float64	0	0	0	1932	1562	204.7596	236.6700	225.2
ABBV	ABBV	float64	0	0	0	1932	1461	166.1200	204.6800	189.3
ALV	ALV	float64	0	0	0	1932	1221	89.6500	111.2100	97.9
AMGN	AMGN	float64	0	0	0	1932	1534	307.0400	340.6300	325.6
AMZN	AMZN	float64	0	0	0	1932	1644	159.5901	200.2825	183.0
AXP	AXP	float64	0	0	0	1932	1670	225.7800	286.5000	256.4
BA	BA	float64	0	0	0	1932	1683	146.4300	196.7300	165.7
BHP	BHP	float64	0	0	0	1932	1194	51.0050	62.9300	55.8
BP	BP	float64	0	0	0	1932	1015	29.0100	36.6850	32.9
BTI	BTI	float64	0	0	0	1932	1051	31.5450	39.4700	35.7
BUD	BUD	float64	0	0	0	1932	989	59.0100	66.8300	62.6
C	C	float64	0	0	0	1932	1275	54.9700	67.6600	62.1
CAT	CAT	float64	0	0	0	1932	1725	315.4450	403.1525	359.0
CRM	CRM	float64	0	0	0	1932	1680	236.5600	300.3921	265.2
CSCO	CSCO	float64	0	0	0	1932	1333	44.7400	57.0100	50.4
CVX	CVX	float64	0	0	0	1932	1476	135.6990	164.1000	148.9
DD	DD	float64	0	0	0	1932	1193	76.8700	89.8700	82.3
DIS	DIS	float64	0	0	0	1932	1365	84.8050	98.6499	92.5
DOW	DOW	float64	0	0	0	1932	993	48.8750	55.7400	52.6
ENR	ENR	float64	0	0	0	1932	713	28.1900	32.9700	30.7
GE	GE	float64	0	0	0	1932	1599	155.9200	194.5000	174.1
GOOG	GOOG	float64	0	0	0	1932	1476	148.6600	193.1500	167.9
GOOGL	GOOGL	float64	0	0	0	1932	1501	147.6700	191.5900	166.4
GS	GS	float64	0	0	0	1932	1753	449.1900	534.8840	497.2
GSK	GSK	float64	0	0	0	1932	1011	36.2650	44.3400	40.3
HD	HD	float64	0	0	0	1932	1790	336.0875	420.7250	378.1
HON	HON	float64	0	0	0	1932	1486	195.6650	222.6900	207.0
HSBC	HSBC	float64	0	0	0	1932	884	40.1700	46.9700	43.7
IBM	IBM	float64	0	0	0	1932	1694	175.5850	236.8000	204.9
INTC	INTC	float64	0	0	0	1932	1376	18.5250	36.1100	24.0

	Name	Type	N/A value	Nan value	Inf values	Count values	Unique values	Min	Max	
JNJ	JNJ	float64	0	0	0	1932	1251	145.3800	167.8250	160.6
JPM	JPM	float64	0	0	0	1932	1514	193.7300	226.1100	213.1
KO	KO	float64	0	0	0	1932	1236	62.3800	73.2399	68.8
MA	MA	float64	0	0	0	1932	1769	429.2600	518.7100	477.2
MCD	MCD	float64	0	0	0	1932	1694	243.7400	316.9900	284.8
META	META	float64	0	0	0	1932	1842	446.2500	599.9800	533.5
MMM	MMM	float64	0	0	0	1932	1425	98.6100	139.8750	126.2
MRK	MRK	float64	0	0	0	1932	1413	101.2900	128.9700	115.2
MSFT	MSFT	float64	0	0	0	1932	1736	393.5500	466.4000	423.4
NKE	NKE	float64	0	0	0	1932	1428	71.1100	90.1700	79.3
NVDA	NVDA	float64	0	0	0	1932	1807	98.7250	143.8900	122.4
NVS	NVS	float64	0	0	0	1932	1161	105.8200	120.8900	113.9
ORCL	ORCL	float64	0	0	0	1932	1570	125.7300	178.2745	152.9
PEP	PEP	float64	0	0	0	1932	1321	161.5800	179.4400	172.0
PFE	PFE	float64	0	0	0	1932	885	27.3250	31.4350	29.1
PG	PG	float64	0	0	0	1932	1235	159.3000	177.8200	169.9
PM	PM	float64	0	0	0	1932	1398	101.6800	133.4000	119.0
ROG	ROG	float64	0	0	0	1932	1363	95.1000	133.4000	109.1
RY	RY	float64	0	0	0	1932	1172	104.5500	126.8300	117.5
SAN	SAN	float64	0	0	0	1932	330	4.3350	5.1850	4.8
SHEL	SHEL	float64	0	0	0	1932	1109	64.5000	73.8600	69.7
TM	TM	float64	0	0	0	1932	1591	166.7900	208.7000	182.3
TRV	TRV	float64	0	0	0	1932	1661	203.0400	265.6500	228.3
TSM	TSM	float64	0	0	0	1932	1674	142.3400	212.2000	175.9
TTE	TTE	float64	0	0	0	1932	961	62.0050	70.4800	67.2
UNH	UNH	float64	0	0	0	1932	1707	486.6000	607.7800	572.3
V	V	float64	0	0	0	1932	1596	253.5000	293.0731	273.9
VZ	VZ	float64	0	0	0	1932	1134	38.7550	45.2186	42.1
WMT	WMT	float64	0	0	0	1932	1424	66.8750	83.3000	75.8
XOM	XOM	float64	0	0	0	1932	1318	107.8900	126.1900	117.0

In [ ]:

In [ ]:

In [ ]:

Main code

In [ ]:
```
# Main code to run the scenarios

test_results = pd.DataFrame()
results=[]
summary=[]

for test_num, test in enumerate(tests.itertuples(index=False,name='TestRow')):
    start_date = test[0]
    end_date = test[1]
    step_type = test[3]
    num_top_tickers = test[4]
    investment = test[5]

    results_row = []
    summary_row = []

    try:
      # Handle step calculation
      step = step_mapping.get(step_type, test[2])
      if step is not None:
          step = step(test[2])  # Pass the step value
      else:
          raise ValueError(f"Invalid step type: {step_type}")

      results_row = {f'Start date': start_date,
                  f'End date': end_date,
                  f'Step': step,
                  f'Top tickers': num_top_tickers,
                  f'Budget for investment': investment
                  }

      summary_row = {f'Start date': start_date,
                  f'End date': end_date,
                  f'Step': step,
                  f'Top tickers': num_top_tickers,
                  f'Budget for investment': investment
                  }

      # Each test will be run in both scenarios: static and variable
      for option in option_type:
        print(f'1 - Option : {option}')
        invest_time_table=invest_table(start_date,end_date,step,option)

        # Each scenario will also be run using open and close price for comparison
```

```
        for price in price_type:

          start_timestamp = datetime.now()
          investment_open=investment
          extra=0

          print(f'         2 - Price : {price} - {len(invest_time_table)} scenarios

          if price=='open':
            price_table = clean_prices_open_wdatetime
          else:
            price_table = clean_prices_close_wdatetime

          # Create the optimal portfolio for each scenario
          for idx, investment_period in enumerate(invest_time_table.itertuples(inde

            investment_start_date = investment_period[0]
            investment_end_date = investment_period[1]

            # Preselect the prices for specific time period
            investment_prices_wdatetime = price_table[(price_table['Datetime'] >= i
            investment_prices = investment_prices_wdatetime.drop(['Datetime'], axis

            # Select top tickers based on minimize method
            top_tickers = select_tickers(investment_prices, num_top_tickers, risk_f
            print(f'                    3 - Scenario {idx+1} : {investment_start_dat

            # Define the precise full stock investment for each top ticker and run
            selected_portfolio=calculate_optimal_weights(investment_prices,top_tick

            # Financial transactions
            weight_column = str(invest_time_table.iloc[idx, 0]) + " - weight"

            # selected_portfolio.rename(columns={selected_portfolio.columns[0]: wei
            columns = selected_portfolio.columns.tolist()
            columns[0] = weight_column
            selected_portfolio.columns = columns

            if idx==0:

              # First transaction - buy
              print(f'                                        Stock transaction: {idx+

              print(f'                                                            I

              portfolio_investment = selected_portfolio.copy()
              price_col = add_prices_to_portfolio(price_table, invest_time_table.il
              portfolio_investment = pd.merge(portfolio_investment, price_col, left
              investment_open+=extra
              extra=buying_stock(investment_start_date,portfolio_investment,invest_
              print(f'                                                            R


            else:
              # Next transaction - sell
              print(f'                                        Stock transaction: {idx+
```

```
            filtered_columns = [col for col in portfolio_investment.index if col
            price_col = add_prices_to_portfolio(price_table, invest_time_table.il
            portfolio_investment = pd.merge(portfolio_investment, price_col, left

            portfolio_investment[str(invest_time_table.iloc[idx,0])+' - Sell']=po
            portfolio_investment[str(invest_time_table.iloc[idx,0])+' - (+) Gain
            investment_open=portfolio_investment[str(invest_time_table.iloc[idx,0
            investment_open+=extra


            # Next transaction - buy
            print(f'                                        Stock transaction: {idx+
            portfolio_investment = pd.merge(portfolio_investment, selected_portfo
            price_col = add_prices_to_portfolio(price_table, invest_time_table.il
            portfolio_investment = pd.merge(portfolio_investment, price_col, left

            print(f'
            extra=buying_stock(investment_start_date,portfolio_investment,invest_
            print(f'

          # End of financial transactions

        # End of top tickers for each scenario
        # Last transaction - sell
        print(f'                                      Stock transaction: {idx+1} -
        filtered_columns = [col for col in portfolio_investment.index if col not
        price_col = add_prices_to_portfolio(price_table, invest_time_table.iloc[i
        portfolio_investment = pd.merge(portfolio_investment, price_col, left_ind

        portfolio_investment[str(invest_time_table.iloc[idx,1])+' - Sell']=portfo
        portfolio_investment[str(invest_time_table.iloc[idx,1])+' - (+) Gain / (-
        investment_open=portfolio_investment[str(invest_time_table.iloc[idx,1])+'
        end_timestamp = datetime.now()
        time_cost = end_timestamp - start_timestamp
        print(f'                                                          Proce


        print(f'                                      Stock transaction: {idx+1} -
        file_name='Results_test for file ' + test_filename + '_' + str(test_num)
        portfolio_investment.to_excel(local_location + file_name)

        print(f'                                       *** RESULTS STORED***\n')
        tickers_selected = (portfolio_investment[str(invest_time_table.iloc[idx,0
        stocks_bought = portfolio_investment[str(invest_time_table.iloc[idx,0])+'
        actual_tickers = (portfolio_investment[str(invest_time_table.iloc[idx,0])
        actual_investment = portfolio_investment[str(invest_time_table.iloc[idx,0
        remainder = extra
        final_sell = portfolio_investment[str(invest_time_table.iloc[idx,1])+' -
        total_gain_loss = portfolio_investment[str(invest_time_table.iloc[idx,1])


        results_row[f'# Transactions ({option}-{price})'] = len(invest_time_table
        results_row[f'# Tickers selected ({option}-{price})'] = tickers_selected
        results_row[f'# Stocks bought ({option}-{price})'] = stocks_bought
        results_row[f'# Tickers bought ({option}-{price})'] = actual_tickers
```

```
            results_row[f'$ Actual investment ({option}-{price})'] = actual_investmen
            results_row[f'$ Remainder ({option}-{price})'] = remainder
            results_row[f'$ Final Sell ({option}-{price})'] = final_sell
            results_row[f'$ Final Gain (+) / loss (-) ({option}-{price})'] = total_ga
            results_row[f'$ Net gain (+) / loss (-) ({option}-{price})'] = total_gain
            results_row[f'# Time cost in mins ({option}-{price})'] = time_cost.total_


            summary_row[f'# Tickers selected ({option}-{price})'] = tickers_selected
            summary_row[f'$ Net gain (+) / loss (-) ({option}-{price})'] = total_gain
            summary_row[f'# Time cost in mins ({option}-{price})'] = time_cost.total_

          # End of Price : Open and Close
          print(f'        End of transactions for {option} scenario')
          # print(results_row)

        # End of Option : Static and Variable
        print(f'End of transactions for {price} price')
        # print(results_row)

      except ValueError as e:
        print(f"Error: {e}")
        continue
      except Exception as e:
        print(f"An unexpected error occurred: {e}")
        continue

      # End of one test
      print(f'End of running test number {test_num}')
      results.append(results_row)
      summary.append(summary_row)

# End of testing all tests
print("End")

test_results=pd.DataFrame(results)
test_summary=pd.DataFrame(summary)
file_name='Test results for file ' + test_filename + '.xlsx'
test_results.to_excel(local_location + file_name)
```

```
1 - Option : static
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['N
KE', 'TSM', 'ORCL', 'AAPL', 'ABBV', 'GS', 'JNJ', 'IBM', 'CVX', 'HD', 'PEP', 'UNH',
'TRV', 'MA', 'PM']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 18.2 USD
                                     Stock transaction: 1 - Check step
                                     Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
292 minutes
                                     Stock transaction: 1 - Printing results for thi
s scenario
                                      *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['I
BM', 'NKE', 'XOM', 'ROG', 'TSM', 'MA', 'GS', 'TRV', 'UNH', 'META', 'AXP', 'AMZN', 'M
SFT', 'HD', 'ABBV']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 4.62 USD
                                     Stock transaction: 1 - Check step
                                     Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
413 minutes
                                     Stock transaction: 1 - Printing results for thi
s scenario
                                      *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 12 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 14:45:00 - ['U
NH', 'ROG', 'BTI', 'NVDA', 'TTE', 'XOM', 'SAN', 'INTC', 'DD', 'BHP', 'PFE', 'ENR',
'BP', 'TSM', 'DOW']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 2.07 USD
                                     Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-18 14:45:00 to 2024-10-18 15:00:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                     Stock transaction: 2 - Sell
                                     Stock transaction: 2 - Buy
                                                           New investment : $ 1000
000.0 USD
                                                           Remainder of the invest
ment : $ 3.63 USD
```

```
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-18 15:00:00 to 2024-10-18 15:15:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 28.0 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-18 15:15:00 to 2024-10-18 15:30:00 - ['U
NH', 'CAT', 'AXP', 'HON', 'ORCL', 'GS', 'META', 'MSFT', 'JPM', 'MMM', 'GE', 'TSM',
'MA', 'NVDA', 'BTI']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 9.48 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-18 15:30:00 to 2024-10-18 15:45:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 1.19 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-18 15:45:00 to 2024-10-18 16:00:00 - ['I
NTC', 'HSBC', 'META', 'BHP', 'MA', 'KO', 'BTI', 'WMT', 'BUD', 'HON', 'AXP', 'GSK',
'GS', 'GOOGL', 'GOOG']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 3.03 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-18 16:00:00 to 2024-10-18 16:15:00 - ['A
APL', 'WMT', 'MSFT', 'C', 'CAT', 'META', 'MA', 'CSCO', 'IBM', 'ORCL', 'DIS', 'HON',
'HD', 'GSK', 'GOOGL']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 17.5 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-18 16:15:00 to 2024-10-18 16:30:00 - ['A
MGN', 'HD', 'ORCL', 'IBM', 'MA', 'GS', 'ABBV', 'JNJ', 'JPM', 'XOM', 'PG', 'PM', 'AAP
L', 'WMT', 'MRK']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
```

```
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 42.0 USD
                                        Stock transaction: 8 - Check step
                    3 - Scenario 9 : 2024-10-18 16:30:00 to 2024-10-18 16:45:00 - ['C
AT', 'UNH', 'SAN', 'INTC', 'PFE', 'BP', 'ENR', 'BTI', 'GSK', 'HSBC', 'VZ', 'DOW', 'B
HP', 'CSCO', 'C']
                                        Stock transaction: 9 - Sell
                                        Stock transaction: 9 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 1.78 USD
                                        Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-18 16:45:00 to 2024-10-18 17:00:00 -
['XOM', 'DIS', 'MCD', 'KO', 'IBM', 'HON', 'HD', 'GSK', 'GE', 'CVX', 'NKE', 'CSCO',
'CAT', 'BUD', 'BTI']
                                        Stock transaction: 10 - Sell
                                        Stock transaction: 10 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 10.6 USD
                                        Stock transaction: 10 - Check step
                    3 - Scenario 11 : 2024-10-18 17:00:00 to 2024-10-18 17:15:00 -
['XOM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DO
W', 'DIS', 'DD', 'CVX']
                                        Stock transaction: 11 - Sell
                                        Stock transaction: 11 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 7.06 USD
                                        Stock transaction: 11 - Check step
                    3 - Scenario 12 : 2024-10-18 17:15:00 to 2024-10-18 17:30:00 -
['UNH', 'META', 'AXP', 'GE', 'AMZN', 'CRM', 'GS', 'AAPL', 'PG', 'IBM', 'HON', 'DD',
'TRV', 'C', 'CAT']
                                        Stock transaction: 12 - Sell
                                        Stock transaction: 12 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 3.89 USD
                                        Stock transaction: 12 - Check step
                                        Stock transaction: 12 - Final Sell
                                                               Processing time cost: 2.
55 minutes
                                        Stock transaction: 12 - Printing results for th
is scenario
                                         *** RESULTS STORED***

          2 - Price : close - 12 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 14:45:00 - ['M
A', 'IBM', 'PEP', 'DIS', 'PG', 'PM', 'MCD', 'WMT', 'JNJ', 'TRV', 'UNH', 'V', 'HON',
'TM', 'KO']
```

```
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 47.6 USD
                                    Stock transaction: 1 - Check step
                  3 - Scenario 2 : 2024-10-18 14:45:00 to 2024-10-18 15:00:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 1.25 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-18 15:00:00 to 2024-10-18 15:15:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 8.67 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-18 15:15:00 to 2024-10-18 15:30:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 27.6 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-18 15:30:00 to 2024-10-18 15:45:00 - ['X
OM', 'NKE', 'MCD', 'KO', 'JPM', 'JNJ', 'IBM', 'HD', 'GE', 'DIS', 'DD', 'CVX', 'CAT',
'C', 'BP']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 24.2 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-18 15:45:00 to 2024-10-18 16:00:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 24.9 USD
                                    Stock transaction: 6 - Check step
```

```
                    3 - Scenario 7 : 2024-10-18 16:00:00 to 2024-10-18 16:15:00 - ['M
A', 'META', 'UNH', 'AXP', 'TRV', 'GOOGL', 'AMZN', 'GOOG', 'ROG', 'BA', 'TM', 'MCD',
'DOW', 'ENR', 'RY']
                                        Stock transaction: 7 - Sell
                                        Stock transaction: 7 - Buy
                                                              New investment : $ 1000
000.0 USD
                                                              Remainder of the invest
ment : $ 17.6 USD
                                        Stock transaction: 7 - Check step
                    3 - Scenario 8 : 2024-10-18 16:15:00 to 2024-10-18 16:30:00 - ['C
VX', 'CAT', 'XOM', 'CRM', 'UNH', 'BA', 'NKE', 'ROG', 'MMM', 'TM', 'V', 'ALV', 'GE',
'TTE', 'MRK']
                                        Stock transaction: 8 - Sell
                                        Stock transaction: 8 - Buy
                                                              New investment : $ 1000
000.0 USD
                                                              Remainder of the invest
ment : $ 40.0 USD
                                        Stock transaction: 8 - Check step
                    3 - Scenario 9 : 2024-10-18 16:30:00 to 2024-10-18 16:45:00 - ['A
APL', 'PM', 'AXP', 'BA', 'UNH', 'HD', 'NVDA', 'PEP', 'GE', 'HON', 'IBM', 'NKE', 'XO
M', 'CRM', 'CVX']
                                        Stock transaction: 9 - Sell
                                        Stock transaction: 9 - Buy
                                                              New investment : $ 1000
000.0 USD
                                                              Remainder of the invest
ment : $ 76.3 USD
                                        Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-18 16:45:00 to 2024-10-18 17:00:00 -
['AXP', 'HD', 'GOOGL', 'MCD', 'GOOG', 'PG', 'V', 'ALV', 'AMZN', 'ABBV', 'NKE', 'XO
M', 'TM', 'JPM', 'RY']
                                        Stock transaction: 10 - Sell
                                        Stock transaction: 10 - Buy
                                                              New investment : $ 1000
000.0 USD
                                                              Remainder of the invest
ment : $ 8.08 USD
                                        Stock transaction: 10 - Check step
                    3 - Scenario 11 : 2024-10-18 17:00:00 to 2024-10-18 17:15:00 -
['UNH', 'AXP', 'META', 'GE', 'AMZN', 'CRM', 'GS', 'AAPL', 'PG', 'TRV', 'HON', 'DD',
'IBM', 'CAT', 'BA']
                                        Stock transaction: 11 - Sell
                                        Stock transaction: 11 - Buy
                                                              New investment : $ 1000
000.0 USD
                                                              Remainder of the invest
ment : $ 83.3 USD
                                        Stock transaction: 11 - Check step
                    3 - Scenario 12 : 2024-10-18 17:15:00 to 2024-10-18 17:30:00 -
['META', 'MCD', 'CRM', 'SAN', 'INTC', 'BTI', 'BP', 'PFE', 'VZ', 'KO', 'ENR', 'GSK',
'HSBC', 'DOW', 'BUD']
                                        Stock transaction: 12 - Sell
                                        Stock transaction: 12 - Buy
                                                              New investment : $ 1000
```

```
000.0 USD
                                                                  Remainder of the invest
ment : $ 2.14 USD
                                    Stock transaction: 12 - Check step
                                    Stock transaction: 12 - Final Sell
                                                                  Processing time cost: 2.
48 minutes
                                    Stock transaction: 12 - Printing results for th
is scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 0
1 - Option : static
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['N
KE', 'TSM', 'ORCL', 'AAPL', 'ABBV', 'GS', 'JNJ', 'IBM', 'CVX', 'HD', 'PEP', 'UNH',
'TRV', 'MA', 'PM']
                                    Stock transaction: 1 - Fist Buy
                                                                  Initial investment : $ 1
000000.0 USD
                                                                  Remainder of the investm
ent : $ 18.2 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                                  Processing time cost: 0.
287 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['I
BM', 'NKE', 'XOM', 'ROG', 'TSM', 'MA', 'GS', 'TRV', 'UNH', 'META', 'AXP', 'AMZN', 'M
SFT', 'HD', 'ABBV']
                                    Stock transaction: 1 - Fist Buy
                                                                  Initial investment : $ 1
000000.0 USD
                                                                  Remainder of the investm
ent : $ 4.62 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                                  Processing time cost: 0.
305 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 6 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 15:00:00 - ['U
NH', 'GS', 'AXP', 'AMGN', 'CAT', 'IBM', 'TRV', 'GE', 'TSM', 'C', 'ALV', 'GOOGL', 'GO
OG', 'NKE', 'ORCL']
                                    Stock transaction: 1 - Fist Buy
```

```
                                                                    Initial investment : $ 1
000000.0 USD
                                                                    Remainder of the investm
ent : $ 32.5 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-18 15:00:00 to 2024-10-18 15:30:00 - ['H
D', 'META', 'CAT', 'UNH', 'AXP', 'BTI', 'NKE', 'JPM', 'TSM', 'INTC', 'ENR', 'PFE',
'BP', 'ROG', 'MSFT']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                     New investment : $ 1000
000.0 USD
                                                                     Remainder of the invest
ment : $ 6.07 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-18 15:30:00 to 2024-10-18 16:00:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                     New investment : $ 1000
000.0 USD
                                                                     Remainder of the invest
ment : $ 6.71 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-18 16:00:00 to 2024-10-18 16:30:00 - ['H
D', 'CRM', 'AMGN', 'AXP', 'ORCL', 'MA', 'IBM', 'META', 'ALV', 'GS', 'MSFT', 'TSM',
'JPM', 'NVDA', 'ABBV']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                                     New investment : $ 9990
00.0 USD
                                                                     Remainder of the invest
ment : $ 41.8 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-18 16:30:00 to 2024-10-18 17:00:00 - ['C
VX', 'UNH', 'GS', 'AMZN', 'HD', 'AXP', 'META', 'NVDA', 'GOOG', 'MSFT', 'GOOGL', 'P
G', 'DIS', 'AMGN', 'ABBV']
                                        Stock transaction: 5 - Sell
                                        Stock transaction: 5 - Buy
                                                                     New investment : $ 9990
00.0 USD
                                                                     Remainder of the invest
ment : $ 52.3 USD
                                        Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-18 17:00:00 to 2024-10-18 17:30:00 - ['U
NH', 'ABBV', 'AMGN', 'V', 'TM', 'ALV', 'ORCL', 'MCD', 'XOM', 'TSM', 'MA', 'ROG', 'H
D', 'JPM', 'DIS']
                                        Stock transaction: 6 - Sell
                                        Stock transaction: 6 - Buy
                                                                     New investment : $ 9990
00.0 USD
                                                                     Remainder of the invest
ment : $ 13.6 USD
                                        Stock transaction: 6 - Check step
                                        Stock transaction: 6 - Final Sell
```

```
                                                                    Processing time cost: 1.
34 minutes
                                        Stock transaction: 6 - Printing results for thi
s scenario
                                         *** RESULTS STORED***

         2 - Price : close - 6 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 15:00:00 - ['U
NH', 'TRV', 'AXP', 'MA', 'META', 'MSFT', 'AMZN', 'GS', 'ORCL', 'AAPL', 'PEP', 'ALV',
'RY', 'HON', 'CAT']
                                        Stock transaction: 1 - Fist Buy
                                                                    Initial investment : $ 1
000000.0 USD
                                                                    Remainder of the investm
ent : $ 6.26 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-18 15:00:00 to 2024-10-18 15:30:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                     New investment : $ 1000
000.0 USD
                                                                     Remainder of the invest
ment : $ 4.88 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-18 15:30:00 to 2024-10-18 16:00:00 - ['A
APL', 'PEP', 'GOOG', 'GOOGL', 'GSK', 'HD', 'WMT', 'CSCO', 'CAT', 'C', 'META', 'MSF
T', 'NVDA', 'ORCL', 'GE']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                     New investment : $ 1000
000.0 USD
                                                                     Remainder of the invest
ment : $ 0.667 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-18 16:00:00 to 2024-10-18 16:30:00 - ['M
A', 'CAT', 'ORCL', 'HD', 'AMGN', 'IBM', 'AMZN', 'SAN', 'GSK', 'PG', 'BTI', 'NVDA',
'PFE', 'ABBV', 'WMT']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                                     New investment : $ 1000
000.0 USD
                                                                     Remainder of the invest
ment : $ 0.718 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-18 16:30:00 to 2024-10-18 17:00:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                        Stock transaction: 5 - Sell
                                        Stock transaction: 5 - Buy
                                                                     New investment : $ 1000
000.0 USD
                                                                     Remainder of the invest
ment : $ 3.02 USD
                                        Stock transaction: 5 - Check step
```

```
                    3 - Scenario 6 : 2024-10-18 17:00:00 to 2024-10-18 17:30:00 - ['M
CD', 'UNH', 'META', 'GS', 'MA', 'AXP', 'HD', 'CAT', 'MSFT', 'V', 'SAN', 'XOM', 'EN
R', 'INTC', 'BP']
                                        Stock transaction: 6 - Sell
                                        Stock transaction: 6 - Buy
                                                               New investment : $ 1000
000.0 USD
                                                               Remainder of the invest
ment : $ 2.77 USD
                                        Stock transaction: 6 - Check step
                                        Stock transaction: 6 - Final Sell
                                                               Processing time cost: 1.
37 minutes
                                        Stock transaction: 6 - Printing results for thi
s scenario
                                         *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 1
1 - Option : static
         2 - Price : open - 1 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['N
KE', 'TSM', 'ORCL', 'AAPL', 'ABBV', 'GS', 'JNJ', 'IBM', 'CVX', 'HD', 'PEP', 'UNH',
'TRV', 'MA', 'PM']
                                        Stock transaction: 1 - Fist Buy
                                                               Initial investment : $ 1
000000.0 USD
                                                               Remainder of the investm
ent : $ 18.2 USD
                                        Stock transaction: 1 - Check step
                                        Stock transaction: 1 - Final Sell
                                                               Processing time cost: 0.
296 minutes
                                        Stock transaction: 1 - Printing results for thi
s scenario
                                         *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['I
BM', 'NKE', 'XOM', 'ROG', 'TSM', 'MA', 'GS', 'TRV', 'UNH', 'META', 'AXP', 'AMZN', 'M
SFT', 'HD', 'ABBV']
                                        Stock transaction: 1 - Fist Buy
                                                               Initial investment : $ 1
000000.0 USD
                                                               Remainder of the investm
ent : $ 4.62 USD
                                        Stock transaction: 1 - Check step
                                        Stock transaction: 1 - Final Sell
                                                               Processing time cost: 0.
281 minutes
                                        Stock transaction: 1 - Printing results for thi
s scenario
                                         *** RESULTS STORED***

        End of transactions for static scenario
```

```
1 - Option : variable
        2 - Price : open - 3 scenarios
                3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 15:30:00 - ['A
APL', 'UNH', 'GS', 'AXP', 'CAT', 'AMGN', 'IBM', 'GE', 'JNJ', 'PG', 'TRV', 'V', 'BA',
'HD', 'ALV']
                                    Stock transaction: 1 - Fist Buy
                                                       Initial investment : $ 1
000000.0 USD
                                                       Remainder of the investm
ent : $ 54.3 USD
                                    Stock transaction: 1 - Check step
                3 - Scenario 2 : 2024-10-18 15:30:00 to 2024-10-18 16:30:00 - ['H
D', 'ORCL', 'GS', 'AMGN', 'META', 'MSFT', 'TSM', 'MA', 'IBM', 'NVDA', 'WMT', 'PG',
'AAPL', 'AXP', 'ABBV']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 20.6 USD
                                    Stock transaction: 2 - Check step
                3 - Scenario 3 : 2024-10-18 16:30:00 to 2024-10-18 17:30:00 - ['X
OM', 'GS', 'UNH', 'CVX', 'V', 'TM', 'ALV', 'ABBV', 'NKE', 'MA', 'JPM', 'TRV', 'CAT',
'BA', 'TSM']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 16.9 USD
                                    Stock transaction: 3 - Check step
                                    Stock transaction: 3 - Final Sell
                                                       Processing time cost: 0.
757 minutes
                                    Stock transaction: 3 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        2 - Price : close - 3 scenarios
                3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 15:30:00 - ['U
NH', 'HD', 'AMGN', 'BA', 'ABBV', 'CVX', 'IBM', 'ALV', 'JNJ', 'PG', 'V', 'MRK', 'GOOG
L', 'GOOG', 'NKE']
                                    Stock transaction: 1 - Fist Buy
                                                       Initial investment : $ 1
000000.0 USD
                                                       Remainder of the investm
ent : $ 18.5 USD
                                    Stock transaction: 1 - Check step
                3 - Scenario 2 : 2024-10-18 15:30:00 to 2024-10-18 16:30:00 - ['M
A', 'ORCL', 'XOM', 'ALV', 'CAT', 'MSFT', 'TRV', 'CRM', 'UNH', 'MRK', 'PM', 'AMZN',
'BP', 'BA', 'NKE']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
```

```
ment : $ 4.56 USD
                                    Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-18 16:30:00 to 2024-10-18 17:30:00 - ['M
CD', 'UNH', 'META', 'CRM', 'GE', 'NVDA', 'ABBV', 'AAPL', 'IBM', 'PEP', 'PM', 'AXP',
'AMZN', 'MSFT', 'BA']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 4.33 USD
                                    Stock transaction: 3 - Check step
                                    Stock transaction: 3 - Final Sell
                                                          Processing time cost: 0.
715 minutes
                                    Stock transaction: 3 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 2
1 - Option : static
         2 - Price : open - 1 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['N
KE', 'TSM', 'ORCL', 'AAPL', 'ABBV', 'GS', 'JNJ', 'IBM', 'CVX', 'HD', 'PEP', 'UNH',
'TRV', 'MA', 'PM']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 18.2 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
272 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['I
BM', 'NKE', 'XOM', 'ROG', 'TSM', 'MA', 'GS', 'TRV', 'UNH', 'META', 'AXP', 'AMZN', 'M
SFT', 'HD', 'ABBV']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 4.62 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
282 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***
```

```
        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 2 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 16:30:00 - ['A
APL', 'ABBV', 'HD', 'ORCL', 'ROG', 'MCD', 'GS', 'UNH', 'MSFT', 'CVX', 'MA', 'META',
'TSM', 'CRM', 'TRV']
                                     Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 39.4 USD
                                     Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-18 16:30:00 to 2024-10-18 18:30:00 - ['X
OM', 'TSM', 'UNH', 'META', 'AMZN', 'AMGN', 'AXP', 'HD', 'GS', 'MSFT', 'MA', 'IBM',
'JNJ', 'MCD', 'DIS']
                                     Stock transaction: 2 - Sell
                                     Stock transaction: 2 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 68.9 USD
                                     Stock transaction: 2 - Check step
                                     Stock transaction: 2 - Final Sell
                                                        Processing time cost: 0.
562 minutes
                                     Stock transaction: 2 - Printing results for thi
s scenario
                                      *** RESULTS STORED***

         2 - Price : close - 2 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 16:30:00 - ['N
KE', 'MRK', 'ORCL', 'ROG', 'MA', 'IBM', 'CVX', 'UNH', 'ALV', 'META', 'XOM', 'AMGN',
'TSM', 'GS', 'TRV']
                                     Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 24.6 USD
                                     Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-18 16:30:00 to 2024-10-18 18:30:00 - ['T
SM', 'PG', 'XOM', 'UNH', 'AXP', 'AAPL', 'META', 'GS', 'AMGN', 'TRV', 'V', 'ABBV', 'M
A', 'JNJ', 'AMZN']
                                     Stock transaction: 2 - Sell
                                     Stock transaction: 2 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 50.3 USD
                                     Stock transaction: 2 - Check step
                                     Stock transaction: 2 - Final Sell
                                                        Processing time cost: 0.
538 minutes
                                     Stock transaction: 2 - Printing results for thi
s scenario
                                      *** RESULTS STORED***
```

```
        End of transactions for variable scenario
End of transactions for close price
End of running test number 3
1 - Option : static
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['N
KE', 'TSM', 'ORCL', 'AAPL', 'ABBV', 'GS', 'JNJ', 'IBM', 'CVX', 'HD', 'PEP', 'UNH',
'TRV', 'MA', 'PM']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 18.2 USD
                                     Stock transaction: 1 - Check step
                                     Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
29 minutes
                                     Stock transaction: 1 - Printing results for thi
s scenario
                                      *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['I
BM', 'NKE', 'XOM', 'ROG', 'TSM', 'MA', 'GS', 'TRV', 'UNH', 'META', 'AXP', 'AMZN', 'M
SFT', 'HD', 'ABBV']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 4.62 USD
                                     Stock transaction: 1 - Check step
                                     Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
304 minutes
                                     Stock transaction: 1 - Printing results for thi
s scenario
                                      *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['N
KE', 'TSM', 'ORCL', 'AAPL', 'ABBV', 'GS', 'JNJ', 'IBM', 'CVX', 'HD', 'PEP', 'UNH',
'TRV', 'MA', 'PM']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 18.2 USD
                                     Stock transaction: 1 - Check step
                                     Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
275 minutes
                                     Stock transaction: 1 - Printing results for thi
s scenario
```

```
                                    *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['I
BM', 'NKE', 'XOM', 'ROG', 'TSM', 'MA', 'GS', 'TRV', 'UNH', 'META', 'AXP', 'AMZN', 'M
SFT', 'HD', 'ABBV']
                                   Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 4.62 USD
                                   Stock transaction: 1 - Check step
                                   Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
284 minutes
                                   Stock transaction: 1 - Printing results for thi
s scenario
                                    *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 4
1 - Option : static
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['N
KE', 'TSM', 'ORCL', 'AAPL', 'ABBV', 'GS', 'JNJ', 'IBM', 'CVX', 'HD', 'PEP', 'UNH',
'TRV', 'MA', 'PM']
                                   Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 18.2 USD
                                   Stock transaction: 1 - Check step
                                   Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
277 minutes
                                   Stock transaction: 1 - Printing results for thi
s scenario
                                    *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['I
BM', 'NKE', 'XOM', 'ROG', 'TSM', 'MA', 'GS', 'TRV', 'UNH', 'META', 'AXP', 'AMZN', 'M
SFT', 'HD', 'ABBV']
                                   Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 4.62 USD
                                   Stock transaction: 1 - Check step
                                   Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
285 minutes
                                   Stock transaction: 1 - Printing results for thi
s scenario
                                    *** RESULTS STORED***
```

```
        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 18:30:00 - ['X
OM', 'TSM', 'IBM', 'NKE', 'UNH', 'GS', 'ORCL', 'TRV', 'TM', 'MA', 'AXP', 'AMZN', 'CA
T', 'CRM', 'META']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 82.6 USD
                                     Stock transaction: 1 - Check step
                                     Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
317 minutes
                                     Stock transaction: 1 - Printing results for thi
s scenario
                                      *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 18:30:00 - ['X
OM', 'TSM', 'MRK', 'PG', 'IBM', 'ORCL', 'BA', 'UNH', 'MA', 'GS', 'ALV', 'CAT', 'AX
P', 'AMZN', 'CRM']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 38.5 USD
                                     Stock transaction: 1 - Check step
                                     Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
286 minutes
                                     Stock transaction: 1 - Printing results for thi
s scenario
                                      *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 5
1 - Option : static
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['N
KE', 'TSM', 'ORCL', 'AAPL', 'ABBV', 'GS', 'JNJ', 'IBM', 'CVX', 'HD', 'PEP', 'UNH',
'TRV', 'MA', 'PM']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 18.2 USD
                                     Stock transaction: 1 - Check step
                                     Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
336 minutes
                                     Stock transaction: 1 - Printing results for thi
s scenario
```

```
                                    *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['I
BM', 'NKE', 'XOM', 'ROG', 'TSM', 'MA', 'GS', 'TRV', 'UNH', 'META', 'AXP', 'AMZN', 'M
SFT', 'HD', 'ABBV']
                                   Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 4.62 USD
                                   Stock transaction: 1 - Check step
                                   Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
287 minutes
                                   Stock transaction: 1 - Printing results for thi
s scenario
                                    *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 19:30:00 - ['X
OM', 'TSM', 'ROG', 'PG', 'HD', 'ORCL', 'GS', 'IBM', 'UNH', 'JNJ', 'MRK', 'TRV', 'AL
V', 'AXP', 'ABBV']
                                   Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 13.1 USD
                                   Stock transaction: 1 - Check step
                                   Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
285 minutes
                                   Stock transaction: 1 - Printing results for thi
s scenario
                                    *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 19:30:00 - ['T
TE', 'BA', 'WMT', 'ORCL', 'NKE', 'XOM', 'IBM', 'ALV', 'TSM', 'NVDA', 'HD', 'TRV', 'J
PM', 'GOOGL', 'UNH']
                                   Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 30.7 USD
                                   Stock transaction: 1 - Check step
                                   Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
286 minutes
                                   Stock transaction: 1 - Printing results for thi
s scenario
                                    *** RESULTS STORED***

        End of transactions for variable scenario
```

```
End of transactions for close price
End of running test number 6
1 - Option : static
        2 - Price : open - 1 scenarios
                3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'NKE', 'ORCL', 'XOM', 'HD', 'ROG', 'BA', 'NVDA', 'ALV', 'TSM', 'PG', 'IBM', 'TR
V', 'WMT', 'GOOGL']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 8.97 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
265 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        2 - Price : close - 1 scenarios
                3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'IBM', 'XOM', 'JPM', 'TSM', 'BA', 'TRV', 'MSFT', 'HD', 'V', 'ALV', 'ORCL', 'UN
H', 'GS', 'META']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 43.6 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
286 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

       End of transactions for static scenario
1 - Option : variable
        2 - Price : open - 24 scenarios
                3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 14:45:00 - ['U
NH', 'ROG', 'BTI', 'NVDA', 'TTE', 'XOM', 'SAN', 'INTC', 'DD', 'BHP', 'PFE', 'ENR',
'BP', 'TSM', 'DOW']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 2.07 USD
                                    Stock transaction: 1 - Check step
                3 - Scenario 2 : 2024-10-18 14:45:00 to 2024-10-18 15:00:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                         New investment : $ 1000
000.0 USD
```

```
                                                                Remainder of the invest
ment : $ 3.63 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-18 15:00:00 to 2024-10-18 15:15:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 28.0 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-18 15:15:00 to 2024-10-18 15:30:00 - ['U
NH', 'CAT', 'AXP', 'HON', 'ORCL', 'GS', 'META', 'MSFT', 'JPM', 'MMM', 'GE', 'TSM',
'MA', 'NVDA', 'BTI']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 9.48 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-18 15:30:00 to 2024-10-18 15:45:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                        Stock transaction: 5 - Sell
                                        Stock transaction: 5 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 1.19 USD
                                        Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-18 15:45:00 to 2024-10-18 16:00:00 - ['I
NTC', 'HSBC', 'META', 'BHP', 'MA', 'KO', 'BTI', 'WMT', 'BUD', 'HON', 'AXP', 'GSK',
'GS', 'GOOGL', 'GOOG']
                                        Stock transaction: 6 - Sell
                                        Stock transaction: 6 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 3.03 USD
                                        Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-18 16:00:00 to 2024-10-18 16:15:00 - ['A
APL', 'WMT', 'MSFT', 'C', 'CAT', 'META', 'MA', 'CSCO', 'IBM', 'ORCL', 'DIS', 'HON',
'HD', 'GSK', 'GOOGL']
                                        Stock transaction: 7 - Sell
                                        Stock transaction: 7 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 17.5 USD
                                        Stock transaction: 7 - Check step
                    3 - Scenario 8 : 2024-10-18 16:15:00 to 2024-10-18 16:30:00 - ['A
MGN', 'HD', 'ORCL', 'IBM', 'MA', 'GS', 'ABBV', 'JNJ', 'JPM', 'XOM', 'PG', 'PM', 'AAP
L', 'WMT', 'MRK']
```

```
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 42.0 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-18 16:30:00 to 2024-10-18 16:45:00 - ['C
AT', 'UNH', 'SAN', 'INTC', 'PFE', 'BP', 'ENR', 'BTI', 'GSK', 'HSBC', 'VZ', 'DOW', 'B
HP', 'CSCO', 'C']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 1.78 USD
                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-18 16:45:00 to 2024-10-18 17:00:00 -
['XOM', 'DIS', 'MCD', 'KO', 'IBM', 'HON', 'HD', 'GSK', 'GE', 'CVX', 'NKE', 'CSCO',
'CAT', 'BUD', 'BTI']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 10.6 USD
                                    Stock transaction: 10 - Check step
                  3 - Scenario 11 : 2024-10-18 17:00:00 to 2024-10-18 17:15:00 -
['XOM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DO
W', 'DIS', 'DD', 'CVX']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 7.06 USD
                                    Stock transaction: 11 - Check step
                  3 - Scenario 12 : 2024-10-18 17:15:00 to 2024-10-18 17:30:00 -
['UNH', 'META', 'AXP', 'GE', 'AMZN', 'CRM', 'GS', 'AAPL', 'PG', 'IBM', 'HON', 'DD',
'TRV', 'C', 'CAT']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 3.89 USD
                                    Stock transaction: 12 - Check step
                  3 - Scenario 13 : 2024-10-18 17:30:00 to 2024-10-18 17:45:00 -
['MCD', 'META', 'ROG', 'UNH', 'MA', 'MSFT', 'AMGN', 'CAT', 'CRM', 'GS', 'IBM', 'TR
V', 'HD', 'TSM', 'AAPL']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 51.3 USD
```

```
                                    Stock transaction: 13 - Check step
                  3 - Scenario 14 : 2024-10-18 17:45:00 to 2024-10-18 18:00:00 -
['AAPL', 'META', 'UNH', 'GS', 'MA', 'CAT', 'MSFT', 'HD', 'AMGN', 'CRM', 'MCD', 'V',
'IBM', 'BHP', 'DOW']
                                    Stock transaction: 14 - Sell
                                    Stock transaction: 14 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 13.6 USD
                                    Stock transaction: 14 - Check step
                  3 - Scenario 15 : 2024-10-18 18:00:00 to 2024-10-18 18:15:00 -
['META', 'UNH', 'SAN', 'INTC', 'BP', 'PFE', 'BTI', 'ENR', 'GSK', 'VZ', 'HSBC', 'BH
P', 'TTE', 'CSCO', 'C']
                                    Stock transaction: 15 - Sell
                                    Stock transaction: 15 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 3.63 USD
                                    Stock transaction: 15 - Check step
                  3 - Scenario 16 : 2024-10-18 18:15:00 to 2024-10-18 18:30:00 -
['META', 'UNH', 'CVX', 'ENR', 'C', 'XOM', 'INTC', 'DD', 'BTI', 'NVDA', 'BP', 'SAN',
'TTE', 'DOW', 'SHEL']
                                    Stock transaction: 16 - Sell
                                    Stock transaction: 16 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 4.43 USD
                                    Stock transaction: 16 - Check step
                  3 - Scenario 17 : 2024-10-18 18:30:00 to 2024-10-18 18:45:00 -
['UNH', 'AXP', 'MA', 'ROG', 'GOOGL', 'GOOG', 'XOM', 'AMZN', 'JPM', 'ALV', 'CVX', 'G
S', 'WMT', 'JNJ', 'AAPL']
                                    Stock transaction: 17 - Sell
                                    Stock transaction: 17 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 10.8 USD
                                    Stock transaction: 17 - Check step
                  3 - Scenario 18 : 2024-10-18 18:45:00 to 2024-10-18 19:00:00 -
['META', 'UNH', 'XOM', 'CVX', 'GOOGL', 'GOOG', 'ENR', 'DD', 'JPM', 'TTE', 'BP', 'SHE
L', 'SAN', 'BTI', 'PFE']
                                    Stock transaction: 18 - Sell
                                    Stock transaction: 18 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 1.46 USD
                                    Stock transaction: 18 - Check step
                  3 - Scenario 19 : 2024-10-18 19:00:00 to 2024-10-18 19:15:00 -
['XOM', 'META', 'WMT', 'IBM', 'NKE', 'NVDA', 'HON', 'HD', 'GE', 'PFE', 'ENR', 'PM',
'JPM', 'CRM', 'CAT']
                                    Stock transaction: 19 - Sell
                                    Stock transaction: 19 - Buy
```

```
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 4.0 USD
                                        Stock transaction: 19 - Check step
                    3 - Scenario 20 : 2024-10-18 19:15:00 to 2024-10-18 19:30:00 -
['MSFT', 'GS', 'AMGN', 'UNH', 'META', 'BA', 'HD', 'MA', 'TSM', 'CRM', 'ROG', 'ALV',
'CAT', 'MCD', 'CVX']
                                        Stock transaction: 20 - Sell
                                        Stock transaction: 20 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 19.4 USD
                                        Stock transaction: 20 - Check step
                    3 - Scenario 21 : 2024-10-18 19:30:00 to 2024-10-18 19:45:00 -
['TRV', 'META', 'UNH', 'TSM', 'ROG', 'MA', 'AXP', 'ALV', 'CAT', 'AAPL', 'GOOGL', 'GO
OG', 'MRK', 'NVDA', 'AMZN']
                                        Stock transaction: 21 - Sell
                                        Stock transaction: 21 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 22.2 USD
                                        Stock transaction: 21 - Check step
                    3 - Scenario 22 : 2024-10-18 19:45:00 to 2024-10-18 20:00:00 -
['META', 'GS', 'CRM', 'UNH', 'CAT', 'MA', 'MSFT', 'MCD', 'HD', 'SAN', 'ENR', 'PFE',
'BP', 'INTC', 'BTI']
                                        Stock transaction: 22 - Sell
                                        Stock transaction: 22 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 4.48 USD
                                        Stock transaction: 22 - Check step
                    3 - Scenario 23 : 2024-10-18 20:00:00 to 2024-10-21 14:30:00 -
['META', 'UNH', 'BA', 'NVDA', 'SAN', 'BP', 'INTC', 'PEP', 'ENR', 'PFE', 'CSCO', 'BT
I', 'VZ', 'GSK', 'TTE']
                                        Stock transaction: 23 - Sell
                                        Stock transaction: 23 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 1.12 USD
                                        Stock transaction: 23 - Check step
                    3 - Scenario 24 : 2024-10-21 14:30:00 to 2024-10-21 14:45:00 -
['UNH', 'CAT', 'GS', 'PG', 'BA', 'TRV', 'CVX', 'JNJ', 'XOM', 'HON', 'JPM', 'IBM', 'P
M', 'AXP', 'MRK']
                                        Stock transaction: 24 - Sell
                                        Stock transaction: 24 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 14.5 USD
                                        Stock transaction: 24 - Check step
                                        Stock transaction: 24 - Final Sell
```

```
                                                                Processing time cost: 5.
33 minutes
                                        Stock transaction: 24 - Printing results for th
is scenario
                                         *** RESULTS STORED***

         2 - Price : close - 24 scenarios
                     3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 14:45:00 - ['M
A', 'IBM', 'PEP', 'DIS', 'PG', 'PM', 'MCD', 'WMT', 'JNJ', 'TRV', 'UNH', 'V', 'HON',
'TM', 'KO']
                                        Stock transaction: 1 - Fist Buy
                                                                Initial investment : $ 1
000000.0 USD
                                                                Remainder of the investm
ent : $ 47.6 USD
                                        Stock transaction: 1 - Check step
                     3 - Scenario 2 : 2024-10-18 14:45:00 to 2024-10-18 15:00:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                 New investment : $ 1000
000.0 USD
                                                                 Remainder of the invest
ment : $ 1.25 USD
                                        Stock transaction: 2 - Check step
                     3 - Scenario 3 : 2024-10-18 15:00:00 to 2024-10-18 15:15:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                 New investment : $ 1000
000.0 USD
                                                                 Remainder of the invest
ment : $ 8.67 USD
                                        Stock transaction: 3 - Check step
                     3 - Scenario 4 : 2024-10-18 15:15:00 to 2024-10-18 15:30:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                                 New investment : $ 1000
000.0 USD
                                                                 Remainder of the invest
ment : $ 27.6 USD
                                        Stock transaction: 4 - Check step
                     3 - Scenario 5 : 2024-10-18 15:30:00 to 2024-10-18 15:45:00 - ['X
OM', 'NKE', 'MCD', 'KO', 'JPM', 'JNJ', 'IBM', 'HD', 'GE', 'DIS', 'DD', 'CVX', 'CAT',
'C', 'BP']
                                        Stock transaction: 5 - Sell
                                        Stock transaction: 5 - Buy
                                                                 New investment : $ 1000
000.0 USD
                                                                 Remainder of the invest
ment : $ 24.2 USD
                                        Stock transaction: 5 - Check step
```

```
                    3 - Scenario 6 : 2024-10-18 15:45:00 to 2024-10-18 16:00:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                        Stock transaction: 6 - Sell
                                        Stock transaction: 6 - Buy
                                                            New investment : $ 1000
000.0 USD
                                                            Remainder of the invest
ment : $ 24.9 USD
                                        Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-18 16:00:00 to 2024-10-18 16:15:00 - ['M
A', 'META', 'UNH', 'AXP', 'TRV', 'GOOGL', 'AMZN', 'GOOG', 'ROG', 'BA', 'TM', 'MCD',
'DOW', 'ENR', 'RY']
                                        Stock transaction: 7 - Sell
                                        Stock transaction: 7 - Buy
                                                            New investment : $ 1000
000.0 USD
                                                            Remainder of the invest
ment : $ 17.6 USD
                                        Stock transaction: 7 - Check step
                    3 - Scenario 8 : 2024-10-18 16:15:00 to 2024-10-18 16:30:00 - ['C
VX', 'CAT', 'XOM', 'CRM', 'UNH', 'BA', 'NKE', 'ROG', 'MMM', 'TM', 'V', 'ALV', 'GE',
'TTE', 'MRK']
                                        Stock transaction: 8 - Sell
                                        Stock transaction: 8 - Buy
                                                            New investment : $ 1000
000.0 USD
                                                            Remainder of the invest
ment : $ 40.0 USD
                                        Stock transaction: 8 - Check step
                    3 - Scenario 9 : 2024-10-18 16:30:00 to 2024-10-18 16:45:00 - ['A
APL', 'PM', 'AXP', 'BA', 'UNH', 'HD', 'NVDA', 'PEP', 'GE', 'HON', 'IBM', 'NKE', 'XO
M', 'CRM', 'CVX']
                                        Stock transaction: 9 - Sell
                                        Stock transaction: 9 - Buy
                                                            New investment : $ 1000
000.0 USD
                                                            Remainder of the invest
ment : $ 76.3 USD
                                        Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-18 16:45:00 to 2024-10-18 17:00:00 -
['AXP', 'HD', 'GOOGL', 'MCD', 'GOOG', 'PG', 'V', 'ALV', 'AMZN', 'ABBV', 'NKE', 'XO
M', 'TM', 'JPM', 'RY']
                                        Stock transaction: 10 - Sell
                                        Stock transaction: 10 - Buy
                                                            New investment : $ 1000
000.0 USD
                                                            Remainder of the invest
ment : $ 8.08 USD
                                        Stock transaction: 10 - Check step
                    3 - Scenario 11 : 2024-10-18 17:00:00 to 2024-10-18 17:15:00 -
['UNH', 'AXP', 'META', 'GE', 'AMZN', 'CRM', 'GS', 'AAPL', 'PG', 'TRV', 'HON', 'DD',
'IBM', 'CAT', 'BA']
                                        Stock transaction: 11 - Sell
                                        Stock transaction: 11 - Buy
                                                            New investment : $ 1000
```

```
000.0 USD
                                                                Remainder of the invest
ment : $ 83.3 USD
                                        Stock transaction: 11 - Check step
                    3 - Scenario 12 : 2024-10-18 17:15:00 to 2024-10-18 17:30:00 -
['META', 'MCD', 'CRM', 'SAN', 'INTC', 'BTI', 'BP', 'PFE', 'VZ', 'KO', 'ENR', 'GSK',
'HSBC', 'DOW', 'BUD']
                                        Stock transaction: 12 - Sell
                                        Stock transaction: 12 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 2.14 USD
                                        Stock transaction: 12 - Check step
                    3 - Scenario 13 : 2024-10-18 17:30:00 to 2024-10-18 17:45:00 -
['AAPL', 'META', 'UNH', 'MA', 'GS', 'SAN', 'ENR', 'INTC', 'PFE', 'BP', 'BTI', 'HSB
C', 'VZ', 'CSCO', 'ALV']
                                        Stock transaction: 13 - Sell
                                        Stock transaction: 13 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 2.55 USD
                                        Stock transaction: 13 - Check step
                    3 - Scenario 14 : 2024-10-18 17:45:00 to 2024-10-18 18:00:00 -
['META', 'UNH', 'AXP', 'SAN', 'INTC', 'BP', 'PFE', 'ENR', 'GS', 'BTI', 'GSK', 'VZ',
'HSBC', 'BHP', 'TTE']
                                        Stock transaction: 14 - Sell
                                        Stock transaction: 14 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 1.07 USD
                                        Stock transaction: 14 - Check step
                    3 - Scenario 15 : 2024-10-18 18:00:00 to 2024-10-18 18:15:00 -
['META', 'UNH', 'AMGN', 'GS', 'MA', 'AXP', 'MSFT', 'MCD', 'HD', 'CAT', 'AMZN', 'CR
M', 'V', 'TSM', 'IBM']
                                        Stock transaction: 15 - Sell
                                        Stock transaction: 15 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 25.8 USD
                                        Stock transaction: 15 - Check step
                    3 - Scenario 16 : 2024-10-18 18:15:00 to 2024-10-18 18:30:00 -
['XOM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DO
W', 'DIS', 'DD', 'CVX']
                                        Stock transaction: 16 - Sell
                                        Stock transaction: 16 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 11.8 USD
                                        Stock transaction: 16 - Check step
                    3 - Scenario 17 : 2024-10-18 18:30:00 to 2024-10-18 18:45:00 -
['UNH', 'META', 'JPM', 'MSFT', 'GOOG', 'GOOGL', 'XOM', 'CVX', 'ROG', 'V', 'TSM', 'D
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D', 'ENR', 'AAPL', 'SHEL']
                                    Stock transaction: 17 - Sell
                                    Stock transaction: 17 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 11.5 USD
                                    Stock transaction: 17 - Check step
                  3 - Scenario 18 : 2024-10-18 18:45:00 to 2024-10-18 19:00:00 -
['XOM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DO
W', 'DIS', 'DD', 'CVX']
                                    Stock transaction: 18 - Sell
                                    Stock transaction: 18 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 25.7 USD
                                    Stock transaction: 18 - Check step
                  3 - Scenario 19 : 2024-10-18 19:00:00 to 2024-10-18 19:15:00 -
['GS', 'AMGN', 'UNH', 'META', 'MA', 'HD', 'CAT', 'MCD', 'MSFT', 'AXP', 'V', 'IBM',
'JPM', 'GE', 'DIS']
                                    Stock transaction: 19 - Sell
                                    Stock transaction: 19 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 6.09 USD
                                    Stock transaction: 19 - Check step
                  3 - Scenario 20 : 2024-10-18 19:15:00 to 2024-10-18 19:30:00 -
['UNH', 'TRV', 'MA', 'META', 'IBM', 'GS', 'V', 'HD', 'HON', 'MSFT', 'MCD', 'PG', 'PE
P', 'GE', 'C']
                                    Stock transaction: 20 - Sell
                                    Stock transaction: 20 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 52.3 USD
                                    Stock transaction: 20 - Check step
                  3 - Scenario 21 : 2024-10-18 19:30:00 to 2024-10-18 19:45:00 -
['META', 'GS', 'UNH', 'CAT', 'MCD', 'MSFT', 'IBM', 'HON', 'PEP', 'MA', 'ABBV', 'TR
V', 'PG', 'HD', 'CRM']
                                    Stock transaction: 21 - Sell
                                    Stock transaction: 21 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 11.1 USD
                                    Stock transaction: 21 - Check step
                  3 - Scenario 22 : 2024-10-18 19:45:00 to 2024-10-18 20:00:00 -
['XOM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DO
W', 'DIS', 'DD', 'CVX']
                                    Stock transaction: 22 - Sell
                                    Stock transaction: 22 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
```

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ment : $ 1.05 USD
                                    Stock transaction: 22 - Check step
                    3 - Scenario 23 : 2024-10-18 20:00:00 to 2024-10-21 14:30:00 -
['META', 'UNH', 'GS', 'CAT', 'MSFT', 'BA', 'AXP', 'MA', 'HD', 'TRV', 'AMGN', 'SAN',
'BP', 'NVDA', 'V']
                                    Stock transaction: 23 - Sell
                                    Stock transaction: 23 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 0.79 USD
                                    Stock transaction: 23 - Check step
                    3 - Scenario 24 : 2024-10-21 14:30:00 to 2024-10-21 14:45:00 -
['UNH', 'META', 'AMGN', 'MA', 'HD', 'BA', 'ROG', 'V', 'MSFT', 'TRV', 'GS', 'PEP', 'M
CD', 'CRM', 'ABBV']
                                    Stock transaction: 24 - Sell
                                    Stock transaction: 24 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 14.4 USD
                                    Stock transaction: 24 - Check step
                                    Stock transaction: 24 - Final Sell
                                                         Processing time cost: 5.
19 minutes
                                    Stock transaction: 24 - Printing results for th
is scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 7
1 - Option : static
         2 - Price : open - 1 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'NKE', 'ORCL', 'XOM', 'HD', 'ROG', 'BA', 'NVDA', 'ALV', 'TSM', 'PG', 'IBM', 'TR
V', 'WMT', 'GOOGL']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 8.97 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
261 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'IBM', 'XOM', 'JPM', 'TSM', 'BA', 'TRV', 'MSFT', 'HD', 'V', 'ALV', 'ORCL', 'UN
H', 'GS', 'META']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
```

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000000.0 USD
                                                                Remainder of the investm
ent : $ 43.6 USD
                                        Stock transaction: 1 - Check step
                                        Stock transaction: 1 - Final Sell
                                                                Processing time cost: 0.
312 minutes
                                        Stock transaction: 1 - Printing results for thi
s scenario
                                         *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 13 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 15:00:00 - ['U
NH', 'GS', 'AXP', 'AMGN', 'CAT', 'IBM', 'TRV', 'GE', 'TSM', 'C', 'ALV', 'GOOGL', 'GO
OG', 'NKE', 'ORCL']
                                        Stock transaction: 1 - Fist Buy
                                                                Initial investment : $ 1
000000.0 USD
                                                                Remainder of the investm
ent : $ 32.5 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-18 15:00:00 to 2024-10-18 15:30:00 - ['H
D', 'META', 'CAT', 'UNH', 'AXP', 'BTI', 'NKE', 'JPM', 'TSM', 'INTC', 'ENR', 'PFE',
'BP', 'ROG', 'MSFT']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                 New investment : $ 1000
000.0 USD
                                                                 Remainder of the invest
ment : $ 6.07 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-18 15:30:00 to 2024-10-18 16:00:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                 New investment : $ 1000
000.0 USD
                                                                 Remainder of the invest
ment : $ 6.71 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-18 16:00:00 to 2024-10-18 16:30:00 - ['H
D', 'CRM', 'AMGN', 'AXP', 'ORCL', 'MA', 'IBM', 'META', 'ALV', 'GS', 'MSFT', 'TSM',
'JPM', 'NVDA', 'ABBV']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                                 New investment : $ 9990
00.0 USD
                                                                 Remainder of the invest
ment : $ 41.8 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-18 16:30:00 to 2024-10-18 17:00:00 - ['C
VX', 'UNH', 'GS', 'AMZN', 'HD', 'AXP', 'META', 'NVDA', 'GOOG', 'MSFT', 'GOOGL', 'P
G', 'DIS', 'AMGN', 'ABBV']
```

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                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 9990
00.0 USD
                                                        Remainder of the invest
ment : $ 52.3 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-18 17:00:00 to 2024-10-18 17:30:00 - ['U
NH', 'ABBV', 'AMGN', 'V', 'TM', 'ALV', 'ORCL', 'MCD', 'XOM', 'TSM', 'MA', 'ROG', 'H
D', 'JPM', 'DIS']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 9990
00.0 USD
                                                        Remainder of the invest
ment : $ 13.6 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-18 17:30:00 to 2024-10-18 18:00:00 - ['T
SM', 'AAPL', 'ROG', 'MCD', 'AMGN', 'MA', 'GS', 'HD', 'V', 'AXP', 'ABBV', 'JPM', 'MSF
T', 'CAT', 'JNJ']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 9990
00.0 USD
                                                        Remainder of the invest
ment : $ 47.6 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-18 18:00:00 to 2024-10-18 18:30:00 - ['A
APL', 'META', 'UNH', 'TSM', 'AMGN', 'XOM', 'HD', 'CVX', 'NVDA', 'AMZN', 'MCD', 'MA',
'RY', 'TM', 'AXP']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                        New investment : $ 9990
00.0 USD
                                                        Remainder of the invest
ment : $ 55.9 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-18 18:30:00 to 2024-10-18 19:00:00 - ['M
SFT', 'UNH', 'META', 'TSM', 'MCD', 'GS', 'V', 'CAT', 'HD', 'CRM', 'ABBV', 'TRV', 'AM
GN', 'BA', 'AXP']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 20.3 USD
                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-18 19:00:00 to 2024-10-18 19:30:00 -
['CRM', 'AMGN', 'UNH', 'META', 'IBM', 'AXP', 'MCD', 'PG', 'PM', 'AMZN', 'JPM', 'CA
T', 'GE', 'HD', 'TSM']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 8.58 USD
```

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                                    Stock transaction: 10 - Check step
                  3 - Scenario 11 : 2024-10-18 19:30:00 to 2024-10-18 20:00:00 -
['TRV', 'MA', 'CRM', 'GS', 'AMZN', 'V', 'HD', 'GE', 'JPM', 'ENR', 'GOOG', 'GOOGL',
'PG', 'CSCO', 'ORCL']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 18.5 USD
                                    Stock transaction: 11 - Check step
                  3 - Scenario 12 : 2024-10-18 20:00:00 to 2024-10-21 14:30:00 -
['META', 'UNH', 'BA', 'NVDA', 'SAN', 'BP', 'INTC', 'PEP', 'ENR', 'PFE', 'CSCO', 'BT
I', 'VZ', 'GSK', 'TTE']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 3.97 USD
                                    Stock transaction: 12 - Check step
                  3 - Scenario 13 : 2024-10-21 14:30:00 to 2024-10-21 15:00:00 -
['UNH', 'META', 'AXP', 'CAT', 'AMGN', 'HD', 'BA', 'MSFT', 'V', 'MA', 'PEP', 'TRV',
'ABBV', 'CRM', 'AMZN']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 11.8 USD
                                    Stock transaction: 13 - Check step
                                    Stock transaction: 13 - Final Sell
                                                       Processing time cost: 2.
96 minutes
                                    Stock transaction: 13 - Printing results for th
is scenario
                                     *** RESULTS STORED***

         2 - Price : close - 13 scenarios
                  3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 15:00:00 - ['U
NH', 'TRV', 'AXP', 'MA', 'META', 'MSFT', 'AMZN', 'GS', 'ORCL', 'AAPL', 'PEP', 'ALV',
'RY', 'HON', 'CAT']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 6.26 USD
                                    Stock transaction: 1 - Check step
                  3 - Scenario 2 : 2024-10-18 15:00:00 to 2024-10-18 15:30:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
```

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ment : $ 4.88 USD
                                    Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-18 15:30:00 to 2024-10-18 16:00:00 - ['A
APL', 'PEP', 'GOOG', 'GOOGL', 'GSK', 'HD', 'WMT', 'CSCO', 'CAT', 'C', 'META', 'MSF
T', 'NVDA', 'ORCL', 'GE']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 0.667 USD
                                    Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-18 16:00:00 to 2024-10-18 16:30:00 - ['M
A', 'CAT', 'ORCL', 'HD', 'AMGN', 'IBM', 'AMZN', 'SAN', 'GSK', 'PG', 'BTI', 'NVDA',
'PFE', 'ABBV', 'WMT']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 0.718 USD
                                    Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-18 16:30:00 to 2024-10-18 17:00:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 3.02 USD
                                    Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-18 17:00:00 to 2024-10-18 17:30:00 - ['M
CD', 'UNH', 'META', 'GS', 'MA', 'AXP', 'HD', 'CAT', 'MSFT', 'V', 'SAN', 'XOM', 'EN
R', 'INTC', 'BP']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 2.77 USD
                                    Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-18 17:30:00 to 2024-10-18 18:00:00 - ['A
APL', 'META', 'UNH', 'SAN', 'ENR', 'PFE', 'INTC', 'BP', 'BTI', 'CSCO', 'VZ', 'HSBC',
'DOW', 'GSK', 'BHP']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 2.23 USD
                                    Stock transaction: 7 - Check step
                    3 - Scenario 8 : 2024-10-18 18:00:00 to 2024-10-18 18:30:00 - ['X
OM', 'WMT', 'HSBC', 'HON', 'HD', 'GSK', 'GS', 'GOOGL', 'GOOG', 'GE', 'ENR', 'DOW',
'DIS', 'DD', 'CVX']
                                    Stock transaction: 8 - Sell
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                                    Stock transaction: 8 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 17.6 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-18 18:30:00 to 2024-10-18 19:00:00 - ['U
NH', 'CRM', 'HD', 'MA', 'GS', 'AMGN', 'JPM', 'PG', 'TM', 'RY', 'ABBV', 'BHP', 'MET
A', 'DIS', 'DOW']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 30.9 USD
                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-18 19:00:00 to 2024-10-18 19:30:00 -
['MSFT', 'GS', 'AMGN', 'TRV', 'META', 'UNH', 'MA', 'CAT', 'HD', 'MCD', 'AXP', 'TSM',
'V', 'JPM', 'IBM']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 79.7 USD
                                    Stock transaction: 10 - Check step
                  3 - Scenario 11 : 2024-10-18 19:30:00 to 2024-10-18 20:00:00 -
['CRM', 'AMZN', 'GS', 'MA', 'GE', 'AXP', 'GOOGL', 'ROG', 'META', 'GOOG', 'BA', 'AMG
N', 'AAPL', 'JPM', 'TSM']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 97.7 USD
                                    Stock transaction: 11 - Check step
                  3 - Scenario 12 : 2024-10-18 20:00:00 to 2024-10-21 14:30:00 -
['META', 'UNH', 'GS', 'CAT', 'MSFT', 'BA', 'AXP', 'MA', 'HD', 'TRV', 'AMGN', 'SAN',
'BP', 'NVDA', 'V']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 2.17 USD
                                    Stock transaction: 12 - Check step
                  3 - Scenario 13 : 2024-10-21 14:30:00 to 2024-10-21 15:00:00 -
['META', 'UNH', 'ROG', 'MA', 'NVDA', 'TSM', 'ENR', 'AAPL', 'INTC', 'SAN', 'BHP', 'TT
E', 'BTI', 'BP', 'HON']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 2.31 USD
                                    Stock transaction: 13 - Check step
```

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                                    Stock transaction: 13 - Final Sell
                                                        Processing time cost: 3.
11 minutes
                                    Stock transaction: 13 - Printing results for th
is scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 8
1 - Option : static
         2 - Price : open - 1 scenarios
                  3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'NKE', 'ORCL', 'XOM', 'HD', 'ROG', 'BA', 'NVDA', 'ALV', 'TSM', 'PG', 'IBM', 'TR
V', 'WMT', 'GOOGL']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 8.97 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
269 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                  3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'IBM', 'XOM', 'JPM', 'TSM', 'BA', 'TRV', 'MSFT', 'HD', 'V', 'ALV', 'ORCL', 'UN
H', 'GS', 'META']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 43.6 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
279 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 7 scenarios
                  3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 15:30:00 - ['A
APL', 'UNH', 'GS', 'AXP', 'CAT', 'AMGN', 'IBM', 'GE', 'JNJ', 'PG', 'TRV', 'V', 'BA',
'HD', 'ALV']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 54.3 USD
```

```
                                    Stock transaction: 1 - Check step
                  3 - Scenario 2 : 2024-10-18 15:30:00 to 2024-10-18 16:30:00 - ['H
D', 'ORCL', 'GS', 'AMGN', 'META', 'MSFT', 'TSM', 'MA', 'IBM', 'NVDA', 'WMT', 'PG',
'AAPL', 'AXP', 'ABBV']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 20.6 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-18 16:30:00 to 2024-10-18 17:30:00 - ['X
OM', 'GS', 'UNH', 'CVX', 'V', 'TM', 'ALV', 'ABBV', 'NKE', 'MA', 'JPM', 'TRV', 'CAT',
'BA', 'TSM']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 16.9 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-18 17:30:00 to 2024-10-18 18:30:00 - ['A
APL', 'TSM', 'UNH', 'CRM', 'AXP', 'GS', 'HD', 'ALV', 'V', 'XOM', 'CVX', 'JPM', 'NVD
A', 'ABBV', 'MA']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 18.0 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-18 18:30:00 to 2024-10-18 19:30:00 - ['G
OOGL', 'TSM', 'CRM', 'BA', 'GE', 'AMGN', 'ENR', 'HD', 'ALV', 'NVDA', 'TTE', 'HON',
'INTC', 'BP', 'ROG']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 14.9 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-18 19:30:00 to 2024-10-21 14:30:00 - ['M
A', 'TRV', 'CAT', 'UNH', 'TSM', 'META', 'BA', 'GS', 'NVDA', 'GOOG', 'SAN', 'AMZN',
'GE', 'BP', 'GOOGL']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 1.64 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-21 14:30:00 to 2024-10-21 15:30:00 - ['E
NR', 'AAPL', 'AMZN', 'UNH', 'MSFT', 'META', 'MMM', 'MA', 'HD', 'V', 'NVDA', 'ROG',
'GE', 'ABBV', 'CRM']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
```

```
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 77.2 USD
                                        Stock transaction: 7 - Check step
                                        Stock transaction: 7 - Final Sell
                                                                Processing time cost: 1.
78 minutes
                                        Stock transaction: 7 - Printing results for thi
s scenario
                                         *** RESULTS STORED***

         2 - Price : close - 7 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 15:30:00 - ['U
NH', 'HD', 'AMGN', 'BA', 'ABBV', 'CVX', 'IBM', 'ALV', 'JNJ', 'PG', 'V', 'MRK', 'GOOG
L', 'GOOG', 'NKE']
                                        Stock transaction: 1 - Fist Buy
                                                                Initial investment : $ 1
000000.0 USD
                                                                Remainder of the investm
ent : $ 18.5 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-18 15:30:00 to 2024-10-18 16:30:00 - ['M
A', 'ORCL', 'XOM', 'ALV', 'CAT', 'MSFT', 'TRV', 'CRM', 'UNH', 'MRK', 'PM', 'AMZN',
'BP', 'BA', 'NKE']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 4.56 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-18 16:30:00 to 2024-10-18 17:30:00 - ['M
CD', 'UNH', 'META', 'CRM', 'GE', 'NVDA', 'ABBV', 'AAPL', 'IBM', 'PEP', 'PM', 'AXP',
'AMZN', 'MSFT', 'BA']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 4.33 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-18 17:30:00 to 2024-10-18 18:30:00 - ['A
APL', 'META', 'CAT', 'UNH', 'AXP', 'AMGN', 'TSM', 'ALV', 'BUD', 'BP', 'CSCO', 'TTE',
'JNJ', 'SHEL', 'PM']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 28.0 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-18 18:30:00 to 2024-10-18 19:30:00 - ['M
SFT', 'CRM', 'HD', 'TRV', 'TSM', 'UNH', 'META', 'JPM', 'GS', 'MA', 'AMGN', 'BA', 'MC
D', 'INTC', 'ROG']
                                        Stock transaction: 5 - Sell
```

```
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 9990
00.0 USD
                                                        Remainder of the invest
ment : $ 7.3 USD
                                    Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-18 19:30:00 to 2024-10-21 14:30:00 - ['M
ETA', 'BA', 'CRM', 'UNH', 'GS', 'CAT', 'HD', 'MCD', 'AMZN', 'TM', 'TRV', 'HON', 'PE
P', 'RY', 'IBM']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 9990
00.0 USD
                                                        Remainder of the invest
ment : $ 28.9 USD
                                    Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-21 14:30:00 to 2024-10-21 15:30:00 - ['E
NR', 'MCD', 'AXP', 'AMGN', 'GS', 'TSM', 'META', 'TTE', 'CVX', 'XOM', 'GE', 'BHP', 'N
VS', 'UNH', 'BP']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 9990
00.0 USD
                                                        Remainder of the invest
ment : $ 8.75 USD
                                    Stock transaction: 7 - Check step
                                    Stock transaction: 7 - Final Sell
                                                        Processing time cost: 1.
76 minutes
                                    Stock transaction: 7 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 9
1 - Option : static
         2 - Price : open - 1 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'NKE', 'ORCL', 'XOM', 'HD', 'ROG', 'BA', 'NVDA', 'ALV', 'TSM', 'PG', 'IBM', 'TR
V', 'WMT', 'GOOGL']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 8.97 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
271 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
```

```
TE', 'IBM', 'XOM', 'JPM', 'TSM', 'BA', 'TRV', 'MSFT', 'HD', 'V', 'ALV', 'ORCL', 'UN
H', 'GS', 'META']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 43.6 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
287 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 4 scenarios
                  3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 16:30:00 - ['A
APL', 'ABBV', 'HD', 'ORCL', 'ROG', 'MCD', 'GS', 'UNH', 'MSFT', 'CVX', 'MA', 'META',
'TSM', 'CRM', 'TRV']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 39.4 USD
                                    Stock transaction: 1 - Check step
                  3 - Scenario 2 : 2024-10-18 16:30:00 to 2024-10-18 18:30:00 - ['X
OM', 'TSM', 'UNH', 'META', 'AMZN', 'AMGN', 'AXP', 'HD', 'GS', 'MSFT', 'MA', 'IBM',
'JNJ', 'MCD', 'DIS']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 68.9 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-18 18:30:00 to 2024-10-21 14:30:00 - ['X
OM', 'GOOGL', 'MSFT', 'TRV', 'GE', 'BA', 'TSM', 'CRM', 'JPM', 'PFE', 'V', 'UNH', 'H
D', 'MA', 'GS']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 3.4 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'CVX', 'WMT', 'AAPL', 'NVDA', 'GE', 'UNH', 'INTC', 'MA', 'META', 'AXP', 'CRM',
'TTE', 'BTI', 'JPM']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 2.13 USD
```

```
                                    Stock transaction: 4 - Check step
                                    Stock transaction: 4 - Final Sell
                                                        Processing time cost: 1.
1 minutes
                                    Stock transaction: 4 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 4 scenarios
                  3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 16:30:00 - ['N
KE', 'MRK', 'ORCL', 'ROG', 'MA', 'IBM', 'CVX', 'UNH', 'ALV', 'META', 'XOM', 'AMGN',
'TSM', 'GS', 'TRV']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 24.6 USD
                                    Stock transaction: 1 - Check step
                  3 - Scenario 2 : 2024-10-18 16:30:00 to 2024-10-18 18:30:00 - ['T
SM', 'PG', 'XOM', 'UNH', 'AXP', 'AAPL', 'META', 'GS', 'AMGN', 'TRV', 'V', 'ABBV', 'M
A', 'JNJ', 'AMZN']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 50.3 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-18 18:30:00 to 2024-10-21 14:30:00 - ['C
RM', 'MSFT', 'BA', 'TRV', 'UNH', 'HD', 'META', 'GS', 'GE', 'NVDA', 'SHEL', 'CVX', 'E
NR', 'TTE', 'BP']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                         New investment : $ 9990
00.0 USD
                                                         Remainder of the invest
ment : $ 1.94 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'BHP', 'CVX', 'GE', 'AAPL', 'MCD', 'UNH', 'MA', 'NVDA', 'META', 'AMGN', 'MMM',
'AMZN', 'GS', 'HON']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 4.98 USD
                                    Stock transaction: 4 - Check step
                                    Stock transaction: 4 - Final Sell
                                                        Processing time cost: 1.
11 minutes
                                    Stock transaction: 4 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
```

```
End of transactions for close price
End of running test number 10
1 - Option : static
        2 - Price : open - 1 scenarios
                3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'NKE', 'ORCL', 'XOM', 'HD', 'ROG', 'BA', 'NVDA', 'ALV', 'TSM', 'PG', 'IBM', 'TR
V', 'WMT', 'GOOGL']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 8.97 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
263 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        2 - Price : close - 1 scenarios
                3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'IBM', 'XOM', 'JPM', 'TSM', 'BA', 'TRV', 'MSFT', 'HD', 'V', 'ALV', 'ORCL', 'UN
H', 'GS', 'META']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 43.6 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
282 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

       End of transactions for static scenario
1 - Option : variable
        2 - Price : open - 3 scenarios
                3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['N
KE', 'TSM', 'ORCL', 'AAPL', 'ABBV', 'GS', 'JNJ', 'IBM', 'CVX', 'HD', 'PEP', 'UNH',
'TRV', 'MA', 'PM']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 18.2 USD
                                    Stock transaction: 1 - Check step
                3 - Scenario 2 : 2024-10-18 17:30:00 to 2024-10-21 14:30:00 - ['X
OM', 'TRV', 'GOOGL', 'TTE', 'TSM', 'MSFT', 'CRM', 'BA', 'NVDA', 'UNH', 'AAPL', 'CA
T', 'META', 'GE', 'AXP']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                         New investment : $ 9990
00.0 USD
```

```
                                                                    Remainder of the invest
ment : $ 28.3 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-21 14:30:00 to 2024-10-21 17:30:00 - ['E
NR', 'BHP', 'CVX', 'WMT', 'AAPL', 'UNH', 'MCD', 'MA', 'HD', 'NVDA', 'CAT', 'META',
'MSFT', 'AMGN', 'AMZN']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                                     New investment : $ 9990
00.0 USD
                                                                     Remainder of the invest
ment : $ 35.4 USD
                                    Stock transaction: 3 - Check step
                                    Stock transaction: 3 - Final Sell
                                                                    Processing time cost: 0.
845 minutes
                                    Stock transaction: 3 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 3 scenarios
                  3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 17:30:00 - ['I
BM', 'NKE', 'XOM', 'ROG', 'TSM', 'MA', 'GS', 'TRV', 'UNH', 'META', 'AXP', 'AMZN', 'M
SFT', 'HD', 'ABBV']
                                    Stock transaction: 1 - Fist Buy
                                                                    Initial investment : $ 1
000000.0 USD
                                                                    Remainder of the investm
ent : $ 4.62 USD
                                    Stock transaction: 1 - Check step
                  3 - Scenario 2 : 2024-10-18 17:30:00 to 2024-10-21 14:30:00 - ['X
OM', 'TRV', 'TSM', 'BA', 'MSFT', 'GOOGL', 'CRM', 'AXP', 'UNH', 'HD', 'ALV', 'GS', 'A
MZN', 'AAPL', 'MA']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                                     New investment : $ 9990
00.0 USD
                                                                     Remainder of the invest
ment : $ 61.0 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-21 14:30:00 to 2024-10-21 17:30:00 - ['E
NR', 'NVS', 'CVX', 'GE', 'XOM', 'AAPL', 'NVDA', 'TM', 'UNH', 'MA', 'AMGN', 'BA', 'CR
M', 'ROG', 'GS']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                                     New investment : $ 1000
000.0 USD
                                                                     Remainder of the invest
ment : $ 27.6 USD
                                    Stock transaction: 3 - Check step
                                    Stock transaction: 3 - Final Sell
                                                                    Processing time cost: 0.
829 minutes
                                    Stock transaction: 3 - Printing results for thi
s scenario
                                     *** RESULTS STORED***
```

```
        End of transactions for variable scenario
End of transactions for close price
End of running test number 11
1 - Option : static
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'NKE', 'ORCL', 'XOM', 'HD', 'ROG', 'BA', 'NVDA', 'ALV', 'TSM', 'PG', 'IBM', 'TR
V', 'WMT', 'GOOGL']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 8.97 USD
                                     Stock transaction: 1 - Check step
                                     Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
265 minutes
                                     Stock transaction: 1 - Printing results for thi
s scenario
                                      *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'IBM', 'XOM', 'JPM', 'TSM', 'BA', 'TRV', 'MSFT', 'HD', 'V', 'ALV', 'ORCL', 'UN
H', 'GS', 'META']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 43.6 USD
                                     Stock transaction: 1 - Check step
                                     Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
284 minutes
                                     Stock transaction: 1 - Printing results for thi
s scenario
                                      *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 3 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 18:30:00 - ['X
OM', 'TSM', 'IBM', 'NKE', 'UNH', 'GS', 'ORCL', 'TRV', 'TM', 'MA', 'AXP', 'AMZN', 'CA
T', 'CRM', 'META']
                                     Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 82.6 USD
                                     Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-18 18:30:00 to 2024-10-21 14:30:00 - ['X
OM', 'GOOGL', 'MSFT', 'TRV', 'GE', 'BA', 'TSM', 'CRM', 'JPM', 'PFE', 'V', 'UNH', 'H
D', 'MA', 'GS']
                                     Stock transaction: 2 - Sell
                                     Stock transaction: 2 - Buy
```

```
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 1.19 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 14:30:00 to 2024-10-21 18:30:00 - ['E
NR', 'XOM', 'WMT', 'CVX', 'AAPL', 'UNH', 'MA', 'NVDA', 'HD', 'MSFT', 'TSM', 'AMGN',
'GS', 'BA', 'META']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 47.6 USD
                                        Stock transaction: 3 - Check step
                                        Stock transaction: 3 - Final Sell
                                                                Processing time cost: 0.
854 minutes
                                        Stock transaction: 3 - Printing results for thi
s scenario
                                         *** RESULTS STORED***

          2 - Price : close - 3 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 18:30:00 - ['X
OM', 'TSM', 'MRK', 'PG', 'IBM', 'ORCL', 'BA', 'UNH', 'MA', 'GS', 'ALV', 'CAT', 'AX
P', 'AMZN', 'CRM']
                                        Stock transaction: 1 - Fist Buy
                                                                Initial investment : $ 1
000000.0 USD
                                                                Remainder of the investm
ent : $ 38.5 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-18 18:30:00 to 2024-10-21 14:30:00 - ['C
RM', 'MSFT', 'BA', 'TRV', 'UNH', 'HD', 'META', 'GS', 'GE', 'NVDA', 'SHEL', 'CVX', 'E
NR', 'TTE', 'BP']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                New investment : $ 9980
00.0 USD
                                                                Remainder of the invest
ment : $ 30.4 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 14:30:00 to 2024-10-21 18:30:00 - ['E
NR', 'XOM', 'WMT', 'BHP', 'CVX', 'NVS', 'GE', 'TM', 'UNH', 'AAPL', 'NVDA', 'MA', 'P
G', 'META', 'AMZN']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 55.6 USD
                                        Stock transaction: 3 - Check step
                                        Stock transaction: 3 - Final Sell
                                                                Processing time cost: 0.
872 minutes
                                        Stock transaction: 3 - Printing results for thi
```

```
s scenario
                                        *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 12
1 - Option : static
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'NKE', 'ORCL', 'XOM', 'HD', 'ROG', 'BA', 'NVDA', 'ALV', 'TSM', 'PG', 'IBM', 'TR
V', 'WMT', 'GOOGL']
                                       Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 8.97 USD
                                       Stock transaction: 1 - Check step
                                       Stock transaction: 1 - Final Sell
                                                            Processing time cost: 0.
262 minutes
                                       Stock transaction: 1 - Printing results for thi
s scenario
                                        *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-21 14:30:00 - ['T
TE', 'IBM', 'XOM', 'JPM', 'TSM', 'BA', 'TRV', 'MSFT', 'HD', 'V', 'ALV', 'ORCL', 'UN
H', 'GS', 'META']
                                       Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 43.6 USD
                                       Stock transaction: 1 - Check step
                                       Stock transaction: 1 - Final Sell
                                                            Processing time cost: 0.
282 minutes
                                       Stock transaction: 1 - Printing results for thi
s scenario
                                        *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 3 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 19:30:00 - ['X
OM', 'TSM', 'ROG', 'PG', 'HD', 'ORCL', 'GS', 'IBM', 'UNH', 'JNJ', 'MRK', 'TRV', 'AL
V', 'AXP', 'ABBV']
                                       Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 13.1 USD
                                       Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-18 19:30:00 to 2024-10-21 14:30:00 - ['M
A', 'TRV', 'CAT', 'UNH', 'TSM', 'META', 'BA', 'GS', 'NVDA', 'GOOG', 'SAN', 'AMZN',
'GE', 'BP', 'GOOGL']
```

```
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 4.98 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 14:30:00 to 2024-10-21 19:30:00 - ['E
NR', 'WMT', 'CVX', 'XOM', 'RY', 'NVDA', 'AAPL', 'UNH', 'MA', 'HON', 'CAT', 'MSFT',
'PG', 'HD', 'META']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 9.46 USD
                                        Stock transaction: 3 - Check step
                                        Stock transaction: 3 - Final Sell
                                                                Processing time cost: 0.
896 minutes
                                        Stock transaction: 3 - Printing results for thi
s scenario
                                         *** RESULTS STORED***

         2 - Price : close - 3 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 19:30:00 - ['T
TE', 'BA', 'WMT', 'ORCL', 'NKE', 'XOM', 'IBM', 'ALV', 'TSM', 'NVDA', 'HD', 'TRV', 'J
PM', 'GOOGL', 'UNH']
                                        Stock transaction: 1 - Fist Buy
                                                                Initial investment : $ 1
000000.0 USD
                                                                Remainder of the investm
ent : $ 30.7 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-18 19:30:00 to 2024-10-21 14:30:00 - ['M
ETA', 'BA', 'CRM', 'UNH', 'GS', 'CAT', 'HD', 'MCD', 'AMZN', 'TM', 'TRV', 'HON', 'PE
P', 'RY', 'IBM']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 71.7 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 14:30:00 to 2024-10-21 19:30:00 - ['E
NR', 'RY', 'XOM', 'WMT', 'BHP', 'GE', 'NVDA', 'DD', 'TM', 'MSFT', 'UNH', 'AXP', 'H
D', 'MA', 'AMGN']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 23.1 USD
                                        Stock transaction: 3 - Check step
                                        Stock transaction: 3 - Final Sell
                                                                Processing time cost: 0.
```

```
794 minutes
                                    Stock transaction: 3 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 13
1 - Option : static
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-22 14:30:00 - ['T
TE', 'ENR', 'ORCL', 'XOM', 'NKE', 'INTC', 'WMT', 'PG', 'NVDA', 'RY', 'UNH', 'IBM',
'PM', 'TSM', 'AAPL']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 8.64 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
291 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-22 14:30:00 - ['T
TE', 'ENR', 'WMT', 'ORCL', 'DD', 'PG', 'XOM', 'NVDA', 'C', 'TSM', 'NKE', 'UNH', 'P
M', 'IBM', 'AAPL']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 28.3 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
281 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 7 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 16:30:00 - ['A
APL', 'ABBV', 'HD', 'ORCL', 'ROG', 'MCD', 'GS', 'UNH', 'MSFT', 'CVX', 'MA', 'META',
'TSM', 'CRM', 'TRV']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 39.4 USD
                                    Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-18 16:30:00 to 2024-10-18 18:30:00 - ['X
```

```
OM', 'TSM', 'UNH', 'META', 'AMZN', 'AMGN', 'AXP', 'HD', 'GS', 'MSFT', 'MA', 'IBM',
'JNJ', 'MCD', 'DIS']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 68.9 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-18 18:30:00 to 2024-10-21 14:30:00 - ['X
OM', 'GOOGL', 'MSFT', 'TRV', 'GE', 'BA', 'TSM', 'CRM', 'JPM', 'PFE', 'V', 'UNH', 'H
D', 'MA', 'GS']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 3.4 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'CVX', 'WMT', 'AAPL', 'NVDA', 'GE', 'UNH', 'INTC', 'MA', 'META', 'AXP', 'CRM',
'TTE', 'BTI', 'JPM']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 2.13 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['T
M', 'UNH', 'TSM', 'AMGN', 'MA', 'MSFT', 'BA', 'HD', 'GE', 'ROG', 'CVX', 'MMM', 'XO
M', 'PG', 'GOOGL']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 84.8 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'PEP', 'AXP', 'PM', 'GS', 'HD', 'UNH', 'META', 'MSFT', 'CAT', 'ABBV', 'IBM', 'AM
GN', 'TSM', 'ORCL']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 10.3 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['R
OG', 'NVDA', 'MSFT', 'MCD', 'HD', 'CRM', 'CAT', 'GE', 'IBM', 'PM', 'AXP', 'MA', 'PE
P', 'UNH', 'META']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1010
000.0 USD
```

```
                                                                    Remainder of the invest
ment : $ 76.8 USD
                                        Stock transaction: 7 - Check step
                                        Stock transaction: 7 - Final Sell
                                                                    Processing time cost: 1.
91 minutes
                                        Stock transaction: 7 - Printing results for thi
s scenario
                                         *** RESULTS STORED***

         2 - Price : close - 7 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 16:30:00 - ['N
KE', 'MRK', 'ORCL', 'ROG', 'MA', 'IBM', 'CVX', 'UNH', 'ALV', 'META', 'XOM', 'AMGN',
'TSM', 'GS', 'TRV']
                                        Stock transaction: 1 - Fist Buy
                                                                    Initial investment : $ 1
000000.0 USD
                                                                    Remainder of the investm
ent : $ 24.6 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-18 16:30:00 to 2024-10-18 18:30:00 - ['T
SM', 'PG', 'XOM', 'UNH', 'AXP', 'AAPL', 'META', 'GS', 'AMGN', 'TRV', 'V', 'ABBV', 'M
A', 'JNJ', 'AMZN']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                     New investment : $ 1000
000.0 USD
                                                                     Remainder of the invest
ment : $ 50.3 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-18 18:30:00 to 2024-10-21 14:30:00 - ['C
RM', 'MSFT', 'BA', 'TRV', 'UNH', 'HD', 'META', 'GS', 'GE', 'NVDA', 'SHEL', 'CVX', 'E
NR', 'TTE', 'BP']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                     New investment : $ 9990
00.0 USD
                                                                     Remainder of the invest
ment : $ 1.94 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'BHP', 'CVX', 'GE', 'AAPL', 'MCD', 'UNH', 'MA', 'NVDA', 'META', 'AMGN', 'MMM',
'AMZN', 'GS', 'HON']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                                     New investment : $ 1000
000.0 USD
                                                                     Remainder of the invest
ment : $ 4.98 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['P
G', 'AMGN', 'MSFT', 'TSM', 'ROG', 'UNH', 'BA', 'AXP', 'XOM', 'HD', 'CVX', 'TRV', 'PE
P', 'HON', 'JPM']
                                        Stock transaction: 5 - Sell
                                        Stock transaction: 5 - Buy
                                                                     New investment : $ 1000
```

```
000.0 USD
                                                                Remainder of the invest
ment : $ 73.3 USD
                                    Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'ENR', 'MRK', 'GS', 'PEP', 'HD', 'ALV', 'META', 'AMZN', 'NKE', 'BA', 'NVDA', 'UN
H', 'GOOGL', 'V']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 25.8 USD
                                    Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['N
VDA', 'HD', 'ALV', 'META', 'MA', 'UNH', 'BA', 'MCD', 'AXP', 'PM', 'MSFT', 'CRM', 'GO
OG', 'TSM', 'JPM']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 36.8 USD
                                    Stock transaction: 7 - Check step
                                    Stock transaction: 7 - Final Sell
                                                                Processing time cost: 1.
87 minutes
                                    Stock transaction: 7 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 14
1 - Option : static
         2 - Price : open - 1 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-23 14:30:00 - ['T
TE', 'ENR', 'BTI', 'ORCL', 'VZ', 'XOM', 'NVDA', 'PG', 'GOOGL', 'UNH', 'MSFT', 'RY',
'TM', 'CVX', 'TSM']
                                    Stock transaction: 1 - Fist Buy
                                                                Initial investment : $ 1
000000.0 USD
                                                                Remainder of the investm
ent : $ 20.2 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                                Processing time cost: 0.
3 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-23 14:30:00 - ['T
TE', 'ENR', 'BTI', 'ORCL', 'XOM', 'VZ', 'TSM', 'TM', 'PG', 'NVDA', 'UNH', 'GOOGL',
'PM', 'GE', 'INTC']
```

```
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 20.5 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
305 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 10 scenarios
                  3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 16:30:00 - ['A
APL', 'ABBV', 'HD', 'ORCL', 'ROG', 'MCD', 'GS', 'UNH', 'MSFT', 'CVX', 'MA', 'META',
'TSM', 'CRM', 'TRV']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 39.4 USD
                                    Stock transaction: 1 - Check step
                  3 - Scenario 2 : 2024-10-18 16:30:00 to 2024-10-18 18:30:00 - ['X
OM', 'TSM', 'UNH', 'META', 'AMZN', 'AMGN', 'AXP', 'HD', 'GS', 'MSFT', 'MA', 'IBM',
'JNJ', 'MCD', 'DIS']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 68.9 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-18 18:30:00 to 2024-10-21 14:30:00 - ['X
OM', 'GOOGL', 'MSFT', 'TRV', 'GE', 'BA', 'TSM', 'CRM', 'JPM', 'PFE', 'V', 'UNH', 'H
D', 'MA', 'GS']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 3.4 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'CVX', 'WMT', 'AAPL', 'NVDA', 'GE', 'UNH', 'INTC', 'MA', 'META', 'AXP', 'CRM',
'TTE', 'BTI', 'JPM']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 2.13 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['T
```

```
M', 'UNH', 'TSM', 'AMGN', 'MA', 'MSFT', 'BA', 'HD', 'GE', 'ROG', 'CVX', 'MMM', 'XO
M', 'PG', 'GOOGL']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 84.8 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'PEP', 'AXP', 'PM', 'GS', 'HD', 'UNH', 'META', 'MSFT', 'CAT', 'ABBV', 'IBM', 'AM
GN', 'TSM', 'ORCL']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 10.3 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['R
OG', 'NVDA', 'MSFT', 'MCD', 'HD', 'CRM', 'CAT', 'GE', 'IBM', 'PM', 'AXP', 'MA', 'PE
P', 'UNH', 'META']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 76.8 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['C
VX', 'JNJ', 'PG', 'VZ', 'TRV', 'GE', 'GS', 'AXP', 'HD', 'PM', 'AMGN', 'UNH', 'META',
'MSFT', 'AMZN']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 13.0 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'PM', 'GS', 'AMGN', 'MCD', 'META', 'TRV', 'AAPL', 'IBM', 'ABBV', 'GE', 'ORCL',
'HD', 'PEP', 'NVDA']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 8.9 USD
                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'VZ', 'PG', 'GE', 'JNJ', 'TRV', 'UNH', 'TSM', 'XOM', 'MA', 'BA', 'MCD', 'AAP
L', 'META', 'GS']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                        New investment : $ 1010
000.0 USD
```

```
                                                                Remainder of the invest
ment : $ 22.7 USD
                                        Stock transaction: 10 - Check step
                                        Stock transaction: 10 - Final Sell
                                                               Processing time cost: 2.
66 minutes
                                        Stock transaction: 10 - Printing results for th
is scenario
                                         *** RESULTS STORED***

         2 - Price : close - 10 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 16:30:00 - ['N
KE', 'MRK', 'ORCL', 'ROG', 'MA', 'IBM', 'CVX', 'UNH', 'ALV', 'META', 'XOM', 'AMGN',
'TSM', 'GS', 'TRV']
                                        Stock transaction: 1 - Fist Buy
                                                               Initial investment : $ 1
000000.0 USD
                                                               Remainder of the investm
ent : $ 24.6 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-18 16:30:00 to 2024-10-18 18:30:00 - ['T
SM', 'PG', 'XOM', 'UNH', 'AXP', 'AAPL', 'META', 'GS', 'AMGN', 'TRV', 'V', 'ABBV', 'M
A', 'JNJ', 'AMZN']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 50.3 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-18 18:30:00 to 2024-10-21 14:30:00 - ['C
RM', 'MSFT', 'BA', 'TRV', 'UNH', 'HD', 'META', 'GS', 'GE', 'NVDA', 'SHEL', 'CVX', 'E
NR', 'TTE', 'BP']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 1.94 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'BHP', 'CVX', 'GE', 'AAPL', 'MCD', 'UNH', 'MA', 'NVDA', 'META', 'AMGN', 'MMM',
'AMZN', 'GS', 'HON']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 4.98 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['P
G', 'AMGN', 'MSFT', 'TSM', 'ROG', 'UNH', 'BA', 'AXP', 'XOM', 'HD', 'CVX', 'TRV', 'PE
P', 'HON', 'JPM']
                                        Stock transaction: 5 - Sell
                                        Stock transaction: 5 - Buy
                                                                New investment : $ 1000
```

```
000.0 USD
                                                                Remainder of the invest
ment : $ 73.3 USD
                                        Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'ENR', 'MRK', 'GS', 'PEP', 'HD', 'ALV', 'META', 'AMZN', 'NKE', 'BA', 'NVDA', 'UN
H', 'GOOGL', 'V']
                                        Stock transaction: 6 - Sell
                                        Stock transaction: 6 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 25.8 USD
                                        Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['N
VDA', 'HD', 'ALV', 'META', 'MA', 'UNH', 'BA', 'MCD', 'AXP', 'PM', 'MSFT', 'CRM', 'GO
OG', 'TSM', 'JPM']
                                        Stock transaction: 7 - Sell
                                        Stock transaction: 7 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 36.8 USD
                                        Stock transaction: 7 - Check step
                    3 - Scenario 8 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['T
RV', 'PM', 'VZ', 'GS', 'CVX', 'HD', 'GE', 'MSFT', 'MCD', 'CRM', 'AXP', 'ALV', 'JNJ',
'MMM', 'AMZN']
                                        Stock transaction: 8 - Sell
                                        Stock transaction: 8 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 29.7 USD
                                        Stock transaction: 8 - Check step
                    3 - Scenario 9 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'META', 'GS', 'AMGN', 'PM', 'UNH', 'GE', 'GOOG', 'TRV', 'CRM', 'MMM', 'CAT', 'JP
M', 'TSM', 'HON']
                                        Stock transaction: 9 - Sell
                                        Stock transaction: 9 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 122.0 USD
                                        Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'ABBV', 'GE', 'UNH', 'TSM', 'TRV', 'MA', 'MMM', 'MCD', 'JNJ', 'VZ', 'ENR', 'ME
TA', 'NVS', 'HSBC']
                                        Stock transaction: 10 - Sell
                                        Stock transaction: 10 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 14.4 USD
                                        Stock transaction: 10 - Check step
                                        Stock transaction: 10 - Final Sell
                                                               Processing time cost: 2.
```

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67 minutes
                                    Stock transaction: 10 - Printing results for th
is scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 15
1 - Option : static
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-24 14:30:00 - ['T
TE', 'ENR', 'VZ', 'WMT', 'BTI', 'PG', 'PM', 'DIS', 'PEP', 'TSM', 'XOM', 'ORCL', 'M
A', 'MSFT', 'BA']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 20.2 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
277 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-24 14:30:00 - ['T
TE', 'ENR', 'WMT', 'BTI', 'VZ', 'DIS', 'PG', 'TSM', 'PEP', 'PM', 'ORCL', 'BA', 'XO
M', 'GE', 'IBM']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 5.12 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
279 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 13 scenarios
                   3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 16:30:00 - ['A
APL', 'ABBV', 'HD', 'ORCL', 'ROG', 'MCD', 'GS', 'UNH', 'MSFT', 'CVX', 'MA', 'META',
'TSM', 'CRM', 'TRV']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 39.4 USD
                                    Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-18 16:30:00 to 2024-10-18 18:30:00 - ['X
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OM', 'TSM', 'UNH', 'META', 'AMZN', 'AMGN', 'AXP', 'HD', 'GS', 'MSFT', 'MA', 'IBM',
'JNJ', 'MCD', 'DIS']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 68.9 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-18 18:30:00 to 2024-10-21 14:30:00 - ['X
OM', 'GOOGL', 'MSFT', 'TRV', 'GE', 'BA', 'TSM', 'CRM', 'JPM', 'PFE', 'V', 'UNH', 'H
D', 'MA', 'GS']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 3.4 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'CVX', 'WMT', 'AAPL', 'NVDA', 'GE', 'UNH', 'INTC', 'MA', 'META', 'AXP', 'CRM',
'TTE', 'BTI', 'JPM']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 2.13 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['T
M', 'UNH', 'TSM', 'AMGN', 'MA', 'MSFT', 'BA', 'HD', 'GE', 'ROG', 'CVX', 'MMM', 'XO
M', 'PG', 'GOOGL']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 84.8 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'PEP', 'AXP', 'PM', 'GS', 'HD', 'UNH', 'META', 'MSFT', 'CAT', 'ABBV', 'IBM', 'AM
GN', 'TSM', 'ORCL']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 10.3 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['R
OG', 'NVDA', 'MSFT', 'MCD', 'HD', 'CRM', 'CAT', 'GE', 'IBM', 'PM', 'AXP', 'MA', 'PE
P', 'UNH', 'META']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1010
000.0 USD
```

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                                                                Remainder of the invest
ment : $ 76.8 USD
                                        Stock transaction: 7 - Check step
                    3 - Scenario 8 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['C
VX', 'JNJ', 'PG', 'VZ', 'TRV', 'GE', 'GS', 'AXP', 'HD', 'PM', 'AMGN', 'UNH', 'META',
'MSFT', 'AMZN']
                                        Stock transaction: 8 - Sell
                                        Stock transaction: 8 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 13.0 USD
                                        Stock transaction: 8 - Check step
                    3 - Scenario 9 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'PM', 'GS', 'AMGN', 'MCD', 'META', 'TRV', 'AAPL', 'IBM', 'ABBV', 'GE', 'ORCL',
'HD', 'PEP', 'NVDA']
                                        Stock transaction: 9 - Sell
                                        Stock transaction: 9 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 8.9 USD
                                        Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'VZ', 'PG', 'GE', 'JNJ', 'TRV', 'UNH', 'TSM', 'XOM', 'MA', 'BA', 'MCD', 'AAP
L', 'META', 'GS']
                                        Stock transaction: 10 - Sell
                                        Stock transaction: 10 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 22.7 USD
                                        Stock transaction: 10 - Check step
                    3 - Scenario 11 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 -
['JNJ', 'PEP', 'MMM', 'AAPL', 'MA', 'BA', 'IBM', 'NVDA', 'META', 'HON', 'PG', 'RY',
'VZ', 'KO', 'WMT']
                                        Stock transaction: 11 - Sell
                                        Stock transaction: 11 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 0.793 USD
                                        Stock transaction: 11 - Check step
                    3 - Scenario 12 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 -
['PEP', 'PM', 'META', 'ROG', 'TSM', 'AMGN', 'UNH', 'HD', 'HON', 'IBM', 'JNJ', 'MCD',
'VZ', 'ALV', 'XOM']
                                        Stock transaction: 12 - Sell
                                        Stock transaction: 12 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 20.4 USD
                                        Stock transaction: 12 - Check step
                    3 - Scenario 13 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'GS', 'CRM', 'TRV', 'GOOGL', 'UNH', 'MRK', 'GOOG', 'ROG', 'BHP',
'ABBV', 'NVS', 'TM']
```

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                                        Stock transaction: 13 - Sell
                                        Stock transaction: 13 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 4.12 USD
                                        Stock transaction: 13 - Check step
                                        Stock transaction: 13 - Final Sell
                                                               Processing time cost: 3.
51 minutes
                                        Stock transaction: 13 - Printing results for th
is scenario
                                         *** RESULTS STORED***

         2 - Price : close - 13 scenarios
                    3 - Scenario 1 : 2024-10-18 14:30:00 to 2024-10-18 16:30:00 - ['N
KE', 'MRK', 'ORCL', 'ROG', 'MA', 'IBM', 'CVX', 'UNH', 'ALV', 'META', 'XOM', 'AMGN',
'TSM', 'GS', 'TRV']
                                        Stock transaction: 1 - Fist Buy
                                                                Initial investment : $ 1
000000.0 USD
                                                                Remainder of the investm
ent : $ 24.6 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-18 16:30:00 to 2024-10-18 18:30:00 - ['T
SM', 'PG', 'XOM', 'UNH', 'AXP', 'AAPL', 'META', 'GS', 'AMGN', 'TRV', 'V', 'ABBV', 'M
A', 'JNJ', 'AMZN']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 50.3 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-18 18:30:00 to 2024-10-21 14:30:00 - ['C
RM', 'MSFT', 'BA', 'TRV', 'UNH', 'HD', 'META', 'GS', 'GE', 'NVDA', 'SHEL', 'CVX', 'E
NR', 'TTE', 'BP']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 1.94 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'BHP', 'CVX', 'GE', 'AAPL', 'MCD', 'UNH', 'MA', 'NVDA', 'META', 'AMGN', 'MMM',
'AMZN', 'GS', 'HON']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 4.98 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['P
G', 'AMGN', 'MSFT', 'TSM', 'ROG', 'UNH', 'BA', 'AXP', 'XOM', 'HD', 'CVX', 'TRV', 'PE
```

```
P', 'HON', 'JPM']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 73.3 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'ENR', 'MRK', 'GS', 'PEP', 'HD', 'ALV', 'META', 'AMZN', 'NKE', 'BA', 'NVDA', 'UN
H', 'GOOGL', 'V']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 25.8 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['N
VDA', 'HD', 'ALV', 'META', 'MA', 'UNH', 'BA', 'MCD', 'AXP', 'PM', 'MSFT', 'CRM', 'GO
OG', 'TSM', 'JPM']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 36.8 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['T
RV', 'PM', 'VZ', 'GS', 'CVX', 'HD', 'GE', 'MSFT', 'MCD', 'CRM', 'AXP', 'ALV', 'JNJ',
'MMM', 'AMZN']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 29.7 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'META', 'GS', 'AMGN', 'PM', 'UNH', 'GE', 'GOOG', 'TRV', 'CRM', 'MMM', 'CAT', 'JP
M', 'TSM', 'HON']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 122.0 USD
                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'ABBV', 'GE', 'UNH', 'TSM', 'TRV', 'MA', 'MMM', 'MCD', 'JNJ', 'VZ', 'ENR', 'ME
TA', 'NVS', 'HSBC']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
```

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ment : $ 14.4 USD
                                    Stock transaction: 10 - Check step
                    3 - Scenario 11 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 -
['PEP', 'ABBV', 'RY', 'TSM', 'BA', 'JNJ', 'AAPL', 'PG', 'META', 'NVDA', 'MA', 'HD',
'GS', 'CAT', 'AMZN']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 115.0 USD
                                    Stock transaction: 11 - Check step
                    3 - Scenario 12 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 -
['META', 'UNH', 'HON', 'GS', 'IBM', 'CRM', 'MSFT', 'HD', 'ORCL', 'ABBV', 'BA', 'JN
J', 'AMGN', 'AMZN', 'V']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 153.0 USD
                                    Stock transaction: 12 - Check step
                    3 - Scenario 13 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'MMM', 'UNH', 'GS', 'CRM', 'META', 'JNJ', 'NVS', 'TM', 'BHP', 'H
D', 'MRK', 'ROG']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 17.1 USD
                                    Stock transaction: 13 - Check step
                                    Stock transaction: 13 - Final Sell
                                                       Processing time cost: 3.
47 minutes
                                    Stock transaction: 13 - Printing results for th
is scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 16
1 - Option : static
         2 - Price : open - 1 scenarios
                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-25 14:30:00 - ['B
UD', 'ENR', 'PG', 'TTE', 'WMT', 'VZ', 'DIS', 'NVS', 'PM', 'ORCL', 'GE', 'TM', 'MA',
'UNH', 'GS']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 4.88 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
303 minutes
```

```
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-25 14:30:00 - ['B
UD', 'ENR', 'PG', 'TTE', 'WMT', 'GSK', 'DIS', 'BTI', 'ORCL', 'PM', 'GE', 'DOW', 'V
Z', 'IBM', 'JNJ']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 0.975 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
317 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 13 scenarios
                   3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'CVX', 'WMT', 'AAPL', 'NVDA', 'GE', 'UNH', 'INTC', 'MA', 'META', 'AXP', 'CRM',
'TTE', 'BTI', 'JPM']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 3.38 USD
                                    Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['T
M', 'UNH', 'TSM', 'AMGN', 'MA', 'MSFT', 'BA', 'HD', 'GE', 'ROG', 'CVX', 'MMM', 'XO
M', 'PG', 'GOOGL']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                           New investment : $ 1000
000.0 USD
                                                           Remainder of the invest
ment : $ 36.1 USD
                                    Stock transaction: 2 - Check step
                   3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'PEP', 'AXP', 'PM', 'GS', 'HD', 'UNH', 'META', 'MSFT', 'CAT', 'ABBV', 'IBM', 'AM
GN', 'TSM', 'ORCL']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                           New investment : $ 1000
000.0 USD
                                                           Remainder of the invest
ment : $ 23.8 USD
                                    Stock transaction: 3 - Check step
                   3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['R
OG', 'NVDA', 'MSFT', 'MCD', 'HD', 'CRM', 'CAT', 'GE', 'IBM', 'PM', 'AXP', 'MA', 'PE
P', 'UNH', 'META']
```

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                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 73.3 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['C
VX', 'JNJ', 'PG', 'VZ', 'TRV', 'GE', 'GS', 'AXP', 'HD', 'PM', 'AMGN', 'UNH', 'META',
'MSFT', 'AMZN']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 6.08 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'PM', 'GS', 'AMGN', 'MCD', 'META', 'TRV', 'AAPL', 'IBM', 'ABBV', 'GE', 'ORCL',
'HD', 'PEP', 'NVDA']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 76.8 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'VZ', 'PG', 'GE', 'JNJ', 'TRV', 'UNH', 'TSM', 'XOM', 'MA', 'BA', 'MCD', 'AAP
L', 'META', 'GS']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 10.9 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['J
NJ', 'PEP', 'MMM', 'AAPL', 'MA', 'BA', 'IBM', 'NVDA', 'META', 'HON', 'PG', 'RY', 'V
Z', 'KO', 'WMT']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 29.8 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['P
EP', 'PM', 'META', 'ROG', 'TSM', 'AMGN', 'UNH', 'HD', 'HON', 'IBM', 'JNJ', 'MCD', 'V
Z', 'ALV', 'XOM']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 20.3 USD
```

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                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'GS', 'CRM', 'TRV', 'GOOGL', 'UNH', 'MRK', 'GOOG', 'ROG', 'BHP',
'ABBV', 'NVS', 'TM']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 52.9 USD
                                    Stock transaction: 10 - Check step
                  3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['HON', 'BA', 'JNJ', 'ALV', 'AMGN', 'MRK', 'AAPL', 'HD', 'UNH', 'IBM', 'MCD', 'MET
A', 'MSFT', 'TRV', 'ROG']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 57.3 USD
                                    Stock transaction: 11 - Check step
                  3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'HON', 'MSFT', 'PG', 'GS', 'HD', 'META', 'AMGN', 'UNH', 'MCD', 'IBM',
'CRM', 'TSM', 'NVDA']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 21.0 USD
                                    Stock transaction: 12 - Check step
                  3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['TSM', 'MMM', 'PG', 'NVDA', 'IBM', 'MCD', 'CVX', 'INTC', 'UNH', 'CAT', 'MSFT', 'AAP
L', 'ROG', 'BA', 'GOOGL']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 19.1 USD
                                    Stock transaction: 13 - Check step
                                    Stock transaction: 13 - Final Sell
                                                         Processing time cost: 3.
43 minutes
                                    Stock transaction: 13 - Printing results for th
is scenario
                                     *** RESULTS STORED***

         2 - Price : close - 13 scenarios
                  3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'BHP', 'CVX', 'GE', 'AAPL', 'MCD', 'UNH', 'MA', 'NVDA', 'META', 'AMGN', 'MMM',
'AMZN', 'GS', 'HON']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
```

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ent : $ 38.0 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['P
G', 'AMGN', 'MSFT', 'TSM', 'ROG', 'UNH', 'BA', 'AXP', 'XOM', 'HD', 'CVX', 'TRV', 'PE
P', 'HON', 'JPM']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 57.5 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'ENR', 'MRK', 'GS', 'PEP', 'HD', 'ALV', 'META', 'AMZN', 'NKE', 'BA', 'NVDA', 'UN
H', 'GOOGL', 'V']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 8.54 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['N
VDA', 'HD', 'ALV', 'META', 'MA', 'UNH', 'BA', 'MCD', 'AXP', 'PM', 'MSFT', 'CRM', 'GO
OG', 'TSM', 'JPM']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 73.6 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['T
RV', 'PM', 'VZ', 'GS', 'CVX', 'HD', 'GE', 'MSFT', 'MCD', 'CRM', 'AXP', 'ALV', 'JNJ',
'MMM', 'AMZN']
                                        Stock transaction: 5 - Sell
                                        Stock transaction: 5 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 11.1 USD
                                        Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'META', 'GS', 'AMGN', 'PM', 'UNH', 'GE', 'GOOG', 'TRV', 'CRM', 'MMM', 'CAT', 'JP
M', 'TSM', 'HON']
                                        Stock transaction: 6 - Sell
                                        Stock transaction: 6 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 25.9 USD
                                        Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'ABBV', 'GE', 'UNH', 'TSM', 'TRV', 'MA', 'MMM', 'MCD', 'JNJ', 'VZ', 'ENR', 'ME
TA', 'NVS', 'HSBC']
                                        Stock transaction: 7 - Sell
```

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                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 2.48 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['P
EP', 'ABBV', 'RY', 'TSM', 'BA', 'JNJ', 'AAPL', 'PG', 'META', 'NVDA', 'MA', 'HD', 'G
S', 'CAT', 'AMZN']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 123.0 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['M
ETA', 'UNH', 'HON', 'GS', 'IBM', 'CRM', 'MSFT', 'HD', 'ORCL', 'ABBV', 'BA', 'JNJ',
'AMGN', 'AMZN', 'V']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 9.31 USD
                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'MMM', 'UNH', 'GS', 'CRM', 'META', 'JNJ', 'NVS', 'TM', 'BHP', 'H
D', 'MRK', 'ROG']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 16.9 USD
                                    Stock transaction: 10 - Check step
                  3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['MRK', 'BA', 'AMGN', 'ABBV', 'HON', 'UNH', 'HD', 'AAPL', 'IBM', 'ROG', 'AXP', 'MC
D', 'TSM', 'NVS', 'GS']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 47.3 USD
                                    Stock transaction: 11 - Check step
                  3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'META', 'GS', 'IBM', 'SAN', 'DOW', 'MCD', 'C', 'ENR', 'PFE', 'BP', 'AL
V', 'GSK', 'HD']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 0.264 USD
                                    Stock transaction: 12 - Check step
```

```
                    3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['NVDA', 'MMM', 'TSM', 'INTC', 'IBM', 'PG', 'MCD', 'MSFT', 'UNH', 'PEP', 'ROG', 'CV
X', 'AAPL', 'META', 'BA']
                                      Stock transaction: 13 - Sell
                                      Stock transaction: 13 - Buy
                                                              New investment : $ 9990
00.0 USD
                                                              Remainder of the invest
ment : $ 13.1 USD
                                      Stock transaction: 13 - Check step
                                      Stock transaction: 13 - Final Sell
                                                             Processing time cost: 3.
47 minutes
                                      Stock transaction: 13 - Printing results for th
is scenario
                                       *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 17
1 - Option : static
         2 - Price : open - 1 scenarios
                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-28 14:30:00 - ['E
NR', 'PG', 'NVS', 'WMT', 'TTE', 'PM', 'SHEL', 'TM', 'GE', 'TSM', 'MCD', 'BTI', 'SA
N', 'BP', 'GOOGL']
                                      Stock transaction: 1 - Fist Buy
                                                              Initial investment : $ 1
000000.0 USD
                                                              Remainder of the investm
ent : $ 4.96 USD
                                      Stock transaction: 1 - Check step
                                      Stock transaction: 1 - Final Sell
                                                              Processing time cost: 0.
303 minutes
                                      Stock transaction: 1 - Printing results for thi
s scenario
                                       *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-28 14:30:00 - ['T
TE', 'NVS', 'WMT', 'PG', 'ENR', 'BTI', 'PM', 'SHEL', 'GE', 'TM', 'TSM', 'ROG', 'ORC
L', 'UNH', 'GS']
                                      Stock transaction: 1 - Fist Buy
                                                              Initial investment : $ 1
000000.0 USD
                                                              Remainder of the investm
ent : $ 5.52 USD
                                      Stock transaction: 1 - Check step
                                      Stock transaction: 1 - Final Sell
                                                              Processing time cost: 0.
3 minutes
                                      Stock transaction: 1 - Printing results for thi
s scenario
                                       *** RESULTS STORED***

        End of transactions for static scenario
```

```
1 - Option : variable
        2 - Price : open - 16 scenarios
                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'CVX', 'WMT', 'AAPL', 'NVDA', 'GE', 'UNH', 'INTC', 'MA', 'META', 'AXP', 'CRM',
'TTE', 'BTI', 'JPM']
                                        Stock transaction: 1 - Fist Buy
                                                           Initial investment : $ 1
000000.0 USD
                                                           Remainder of the investm
ent : $ 3.38 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['T
M', 'UNH', 'TSM', 'AMGN', 'MA', 'MSFT', 'BA', 'HD', 'GE', 'ROG', 'CVX', 'MMM', 'XO
M', 'PG', 'GOOGL']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                            New investment : $ 1000
000.0 USD
                                                            Remainder of the invest
ment : $ 36.1 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'PEP', 'AXP', 'PM', 'GS', 'HD', 'UNH', 'META', 'MSFT', 'CAT', 'ABBV', 'IBM', 'AM
GN', 'TSM', 'ORCL']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                            New investment : $ 1000
000.0 USD
                                                            Remainder of the invest
ment : $ 23.8 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['R
OG', 'NVDA', 'MSFT', 'MCD', 'HD', 'CRM', 'CAT', 'GE', 'IBM', 'PM', 'AXP', 'MA', 'PE
P', 'UNH', 'META']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                            New investment : $ 1010
000.0 USD
                                                            Remainder of the invest
ment : $ 73.3 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['C
VX', 'JNJ', 'PG', 'VZ', 'TRV', 'GE', 'GS', 'AXP', 'HD', 'PM', 'AMGN', 'UNH', 'META',
'MSFT', 'AMZN']
                                        Stock transaction: 5 - Sell
                                        Stock transaction: 5 - Buy
                                                            New investment : $ 1010
000.0 USD
                                                            Remainder of the invest
ment : $ 6.08 USD
                                        Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'PM', 'GS', 'AMGN', 'MCD', 'META', 'TRV', 'AAPL', 'IBM', 'ABBV', 'GE', 'ORCL',
'HD', 'PEP', 'NVDA']
                                        Stock transaction: 6 - Sell
                                        Stock transaction: 6 - Buy
```

```
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 76.8 USD
                                        Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'VZ', 'PG', 'GE', 'JNJ', 'TRV', 'UNH', 'TSM', 'XOM', 'MA', 'BA', 'MCD', 'AAP
L', 'META', 'GS']
                                        Stock transaction: 7 - Sell
                                        Stock transaction: 7 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 10.9 USD
                                        Stock transaction: 7 - Check step
                    3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['J
NJ', 'PEP', 'MMM', 'AAPL', 'MA', 'BA', 'IBM', 'NVDA', 'META', 'HON', 'PG', 'RY', 'V
Z', 'KO', 'WMT']
                                        Stock transaction: 8 - Sell
                                        Stock transaction: 8 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 29.8 USD
                                        Stock transaction: 8 - Check step
                    3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['P
EP', 'PM', 'META', 'ROG', 'TSM', 'AMGN', 'UNH', 'HD', 'HON', 'IBM', 'JNJ', 'MCD', 'V
Z', 'ALV', 'XOM']
                                        Stock transaction: 9 - Sell
                                        Stock transaction: 9 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 20.3 USD
                                        Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'GS', 'CRM', 'TRV', 'GOOGL', 'UNH', 'MRK', 'GOOG', 'ROG', 'BHP',
'ABBV', 'NVS', 'TM']
                                        Stock transaction: 10 - Sell
                                        Stock transaction: 10 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 52.9 USD
                                        Stock transaction: 10 - Check step
                    3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['HON', 'BA', 'JNJ', 'ALV', 'AMGN', 'MRK', 'AAPL', 'HD', 'UNH', 'IBM', 'MCD', 'MET
A', 'MSFT', 'TRV', 'ROG']
                                        Stock transaction: 11 - Sell
                                        Stock transaction: 11 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 57.3 USD
                                        Stock transaction: 11 - Check step
                    3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
```

```
['TRV', 'MA', 'HON', 'MSFT', 'PG', 'GS', 'HD', 'META', 'AMGN', 'UNH', 'MCD', 'IBM',
'CRM', 'TSM', 'NVDA']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 21.0 USD
                                    Stock transaction: 12 - Check step
                  3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['TSM', 'MMM', 'PG', 'NVDA', 'IBM', 'MCD', 'CVX', 'INTC', 'UNH', 'CAT', 'MSFT', 'AAP
L', 'ROG', 'BA', 'GOOGL']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 19.1 USD
                                    Stock transaction: 13 - Check step
                  3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['SHEL', 'PG', 'ENR', 'ROG', 'MRK', 'HON', 'META', 'CRM', 'AXP', 'SAN', 'VZ', 'PFE',
'BTI', 'GSK', 'HSBC']
                                    Stock transaction: 14 - Sell
                                    Stock transaction: 14 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 0.239 USD
                                    Stock transaction: 14 - Check step
                  3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['PEP', 'AMGN', 'ROG', 'TSM', 'UNH', 'ABBV', 'ALV', 'HD', 'GOOGL', 'CRM', 'GOOG', 'N
KE', 'CVX', 'TM', 'PG']
                                    Stock transaction: 15 - Sell
                                    Stock transaction: 15 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 22.2 USD
                                    Stock transaction: 15 - Check step
                  3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GOOG', 'PM', 'AMGN', 'TSM', 'META', 'MA', 'HD', 'MSFT', 'BA', 'GE', 'CAT',
'TRV', 'GOOGL', 'ABBV']
                                    Stock transaction: 16 - Sell
                                    Stock transaction: 16 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 49.3 USD
                                    Stock transaction: 16 - Check step
                                    Stock transaction: 16 - Final Sell
                                                         Processing time cost: 4.
14 minutes
                                    Stock transaction: 16 - Printing results for th
is scenario
                                     *** RESULTS STORED***
```

```
        2 - Price : close - 16 scenarios
                  3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'BHP', 'CVX', 'GE', 'AAPL', 'MCD', 'UNH', 'MA', 'NVDA', 'META', 'AMGN', 'MMM',
'AMZN', 'GS', 'HON']
                                    Stock transaction: 1 - Fist Buy
                                                       Initial investment : $ 1
000000.0 USD
                                                       Remainder of the investm
ent : $ 38.0 USD
                                    Stock transaction: 1 - Check step
                  3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['P
G', 'AMGN', 'MSFT', 'TSM', 'ROG', 'UNH', 'BA', 'AXP', 'XOM', 'HD', 'CVX', 'TRV', 'PE
P', 'HON', 'JPM']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 57.5 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'ENR', 'MRK', 'GS', 'PEP', 'HD', 'ALV', 'META', 'AMZN', 'NKE', 'BA', 'NVDA', 'UN
H', 'GOOGL', 'V']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 8.54 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['N
VDA', 'HD', 'ALV', 'META', 'MA', 'UNH', 'BA', 'MCD', 'AXP', 'PM', 'MSFT', 'CRM', 'GO
OG', 'TSM', 'JPM']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 73.6 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['T
RV', 'PM', 'VZ', 'GS', 'CVX', 'HD', 'GE', 'MSFT', 'MCD', 'CRM', 'AXP', 'ALV', 'JNJ',
'MMM', 'AMZN']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 11.1 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'META', 'GS', 'AMGN', 'PM', 'UNH', 'GE', 'GOOG', 'TRV', 'CRM', 'MMM', 'CAT', 'JP
M', 'TSM', 'HON']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1000
```

```
000.0 USD
                                                                Remainder of the invest
ment : $ 25.9 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'ABBV', 'GE', 'UNH', 'TSM', 'TRV', 'MA', 'MMM', 'MCD', 'JNJ', 'VZ', 'ENR', 'ME
TA', 'NVS', 'HSBC']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 2.48 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['P
EP', 'ABBV', 'RY', 'TSM', 'BA', 'JNJ', 'AAPL', 'PG', 'META', 'NVDA', 'MA', 'HD', 'G
S', 'CAT', 'AMZN']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 123.0 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['M
ETA', 'UNH', 'HON', 'GS', 'IBM', 'CRM', 'MSFT', 'HD', 'ORCL', 'ABBV', 'BA', 'JNJ',
'AMGN', 'AMZN', 'V']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 9.31 USD
                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'MMM', 'UNH', 'GS', 'CRM', 'META', 'JNJ', 'NVS', 'TM', 'BHP', 'H
D', 'MRK', 'ROG']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 16.9 USD
                                    Stock transaction: 10 - Check step
                  3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['MRK', 'BA', 'AMGN', 'ABBV', 'HON', 'UNH', 'HD', 'AAPL', 'IBM', 'ROG', 'AXP', 'MC
D', 'TSM', 'NVS', 'GS']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 47.3 USD
                                    Stock transaction: 11 - Check step
                  3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'META', 'GS', 'IBM', 'SAN', 'DOW', 'MCD', 'C', 'ENR', 'PFE', 'BP', 'AL
```

```
V', 'GSK', 'HD']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 0.264 USD
                                    Stock transaction: 12 - Check step
                  3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['NVDA', 'MMM', 'TSM', 'INTC', 'IBM', 'PG', 'MCD', 'MSFT', 'UNH', 'PEP', 'ROG', 'CV
X', 'AAPL', 'META', 'BA']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                        New investment : $ 9990
00.0 USD
                                                        Remainder of the invest
ment : $ 13.1 USD
                                    Stock transaction: 13 - Check step
                  3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['PG', 'SHEL', 'BP', 'ROG', 'MRK', 'CRM', 'AMGN', 'IBM', 'XOM', 'GS', 'NVDA', 'AXP',
'ABBV', 'CAT', 'HD']
                                    Stock transaction: 14 - Sell
                                    Stock transaction: 14 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 27.5 USD
                                    Stock transaction: 14 - Check step
                  3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['IBM', 'ROG', 'ABBV', 'XOM', 'TSM', 'AMGN', 'MA', 'GS', 'TRV', 'UNH', 'META', 'NVD
A', 'HON', 'AMZN', 'DD']
                                    Stock transaction: 15 - Sell
                                    Stock transaction: 15 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 32.6 USD
                                    Stock transaction: 15 - Check step
                  3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GE', 'AMGN', 'GOOG', 'META', 'CRM', 'TRV', 'TSM', 'MMM', 'MSFT', 'UNH', 'G
S', 'BA', 'AMZN', 'V']
                                    Stock transaction: 16 - Sell
                                    Stock transaction: 16 - Buy
                                                        New investment : $ 9980
00.0 USD
                                                        Remainder of the invest
ment : $ 75.7 USD
                                    Stock transaction: 16 - Check step
                                    Stock transaction: 16 - Final Sell
                                                       Processing time cost: 4.
21 minutes
                                    Stock transaction: 16 - Printing results for th
is scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
```

```
End of transactions for close price
End of running test number 18
1 - Option : static
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-28 14:30:00 - ['E
NR', 'PG', 'NVS', 'WMT', 'TTE', 'PM', 'SHEL', 'TM', 'GE', 'TSM', 'MCD', 'BTI', 'SA
N', 'BP', 'GOOGL']
                                       Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 4.96 USD
                                       Stock transaction: 1 - Check step
                                       Stock transaction: 1 - Final Sell
                                                            Processing time cost: 0.
301 minutes
                                       Stock transaction: 1 - Printing results for thi
s scenario
                                        *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-28 14:30:00 - ['T
TE', 'NVS', 'WMT', 'PG', 'ENR', 'BTI', 'PM', 'SHEL', 'GE', 'TM', 'TSM', 'ROG', 'ORC
L', 'UNH', 'GS']
                                       Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 5.52 USD
                                       Stock transaction: 1 - Check step
                                       Stock transaction: 1 - Final Sell
                                                            Processing time cost: 0.
321 minutes
                                       Stock transaction: 1 - Printing results for thi
s scenario
                                        *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 16 scenarios
                   3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'CVX', 'WMT', 'AAPL', 'NVDA', 'GE', 'UNH', 'INTC', 'MA', 'META', 'AXP', 'CRM',
'TTE', 'BTI', 'JPM']
                                       Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 3.38 USD
                                       Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['T
M', 'UNH', 'TSM', 'AMGN', 'MA', 'MSFT', 'BA', 'HD', 'GE', 'ROG', 'CVX', 'MMM', 'XO
M', 'PG', 'GOOGL']
                                       Stock transaction: 2 - Sell
                                       Stock transaction: 2 - Buy
                                                             New investment : $ 1000
000.0 USD
```

```
                                                                Remainder of the invest
ment : $ 36.1 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'PEP', 'AXP', 'PM', 'GS', 'HD', 'UNH', 'META', 'MSFT', 'CAT', 'ABBV', 'IBM', 'AM
GN', 'TSM', 'ORCL']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 23.8 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['R
OG', 'NVDA', 'MSFT', 'MCD', 'HD', 'CRM', 'CAT', 'GE', 'IBM', 'PM', 'AXP', 'MA', 'PE
P', 'UNH', 'META']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 73.3 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['C
VX', 'JNJ', 'PG', 'VZ', 'TRV', 'GE', 'GS', 'AXP', 'HD', 'PM', 'AMGN', 'UNH', 'META',
'MSFT', 'AMZN']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 6.08 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'PM', 'GS', 'AMGN', 'MCD', 'META', 'TRV', 'AAPL', 'IBM', 'ABBV', 'GE', 'ORCL',
'HD', 'PEP', 'NVDA']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 76.8 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'VZ', 'PG', 'GE', 'JNJ', 'TRV', 'UNH', 'TSM', 'XOM', 'MA', 'BA', 'MCD', 'AAP
L', 'META', 'GS']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 10.9 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['J
NJ', 'PEP', 'MMM', 'AAPL', 'MA', 'BA', 'IBM', 'NVDA', 'META', 'HON', 'PG', 'RY', 'V
Z', 'KO', 'WMT']
```

```
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 29.8 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['P
EP', 'PM', 'META', 'ROG', 'TSM', 'AMGN', 'UNH', 'HD', 'HON', 'IBM', 'JNJ', 'MCD', 'V
Z', 'ALV', 'XOM']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 20.3 USD
                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'GS', 'CRM', 'TRV', 'GOOGL', 'UNH', 'MRK', 'GOOG', 'ROG', 'BHP',
'ABBV', 'NVS', 'TM']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 52.9 USD
                                    Stock transaction: 10 - Check step
                  3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['HON', 'BA', 'JNJ', 'ALV', 'AMGN', 'MRK', 'AAPL', 'HD', 'UNH', 'IBM', 'MCD', 'MET
A', 'MSFT', 'TRV', 'ROG']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 57.3 USD
                                    Stock transaction: 11 - Check step
                  3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'HON', 'MSFT', 'PG', 'GS', 'HD', 'META', 'AMGN', 'UNH', 'MCD', 'IBM',
'CRM', 'TSM', 'NVDA']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 21.0 USD
                                    Stock transaction: 12 - Check step
                  3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['TSM', 'MMM', 'PG', 'NVDA', 'IBM', 'MCD', 'CVX', 'INTC', 'UNH', 'CAT', 'MSFT', 'AAP
L', 'ROG', 'BA', 'GOOGL']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 19.1 USD
```

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                                    Stock transaction: 13 - Check step
                  3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['SHEL', 'PG', 'ENR', 'ROG', 'MRK', 'HON', 'META', 'CRM', 'AXP', 'SAN', 'VZ', 'PFE',
'BTI', 'GSK', 'HSBC']
                                    Stock transaction: 14 - Sell
                                    Stock transaction: 14 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 0.239 USD
                                    Stock transaction: 14 - Check step
                  3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['PEP', 'AMGN', 'ROG', 'TSM', 'UNH', 'ABBV', 'ALV', 'HD', 'GOOGL', 'CRM', 'GOOG', 'N
KE', 'CVX', 'TM', 'PG']
                                    Stock transaction: 15 - Sell
                                    Stock transaction: 15 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 22.2 USD
                                    Stock transaction: 15 - Check step
                  3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GOOG', 'PM', 'AMGN', 'TSM', 'META', 'MA', 'HD', 'MSFT', 'BA', 'GE', 'CAT',
'TRV', 'GOOGL', 'ABBV']
                                    Stock transaction: 16 - Sell
                                    Stock transaction: 16 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 49.3 USD
                                    Stock transaction: 16 - Check step
                                    Stock transaction: 16 - Final Sell
                                                       Processing time cost: 4.
17 minutes
                                    Stock transaction: 16 - Printing results for th
is scenario
                                     *** RESULTS STORED***

         2 - Price : close - 16 scenarios
                  3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'BHP', 'CVX', 'GE', 'AAPL', 'MCD', 'UNH', 'MA', 'NVDA', 'META', 'AMGN', 'MMM',
'AMZN', 'GS', 'HON']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 38.0 USD
                                    Stock transaction: 1 - Check step
                  3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['P
G', 'AMGN', 'MSFT', 'TSM', 'ROG', 'UNH', 'BA', 'AXP', 'XOM', 'HD', 'CVX', 'TRV', 'PE
P', 'HON', 'JPM']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
```

```
ment : $ 57.5 USD
                                    Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'ENR', 'MRK', 'GS', 'PEP', 'HD', 'ALV', 'META', 'AMZN', 'NKE', 'BA', 'NVDA', 'UN
H', 'GOOGL', 'V']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 8.54 USD
                                    Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['N
VDA', 'HD', 'ALV', 'META', 'MA', 'UNH', 'BA', 'MCD', 'AXP', 'PM', 'MSFT', 'CRM', 'GO
OG', 'TSM', 'JPM']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 73.6 USD
                                    Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['T
RV', 'PM', 'VZ', 'GS', 'CVX', 'HD', 'GE', 'MSFT', 'MCD', 'CRM', 'AXP', 'ALV', 'JNJ',
'MMM', 'AMZN']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 11.1 USD
                                    Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'META', 'GS', 'AMGN', 'PM', 'UNH', 'GE', 'GOOG', 'TRV', 'CRM', 'MMM', 'CAT', 'JP
M', 'TSM', 'HON']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 25.9 USD
                                    Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'ABBV', 'GE', 'UNH', 'TSM', 'TRV', 'MA', 'MMM', 'MCD', 'JNJ', 'VZ', 'ENR', 'ME
TA', 'NVS', 'HSBC']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 2.48 USD
                                    Stock transaction: 7 - Check step
                    3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['P
EP', 'ABBV', 'RY', 'TSM', 'BA', 'JNJ', 'AAPL', 'PG', 'META', 'NVDA', 'MA', 'HD', 'G
S', 'CAT', 'AMZN']
                                    Stock transaction: 8 - Sell
```

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                                    Stock transaction: 8 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 123.0 USD
                                    Stock transaction: 8 - Check step
                    3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['M
ETA', 'UNH', 'HON', 'GS', 'IBM', 'CRM', 'MSFT', 'HD', 'ORCL', 'ABBV', 'BA', 'JNJ',
'AMGN', 'AMZN', 'V']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 9.31 USD
                                    Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'MMM', 'UNH', 'GS', 'CRM', 'META', 'JNJ', 'NVS', 'TM', 'BHP', 'H
D', 'MRK', 'ROG']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 16.9 USD
                                    Stock transaction: 10 - Check step
                    3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['MRK', 'BA', 'AMGN', 'ABBV', 'HON', 'UNH', 'HD', 'AAPL', 'IBM', 'ROG', 'AXP', 'MC
D', 'TSM', 'NVS', 'GS']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 47.3 USD
                                    Stock transaction: 11 - Check step
                    3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'META', 'GS', 'IBM', 'SAN', 'DOW', 'MCD', 'C', 'ENR', 'PFE', 'BP', 'AL
V', 'GSK', 'HD']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 0.264 USD
                                    Stock transaction: 12 - Check step
                    3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['NVDA', 'MMM', 'TSM', 'INTC', 'IBM', 'PG', 'MCD', 'MSFT', 'UNH', 'PEP', 'ROG', 'CV
X', 'AAPL', 'META', 'BA']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                        New investment : $ 9990
00.0 USD
                                                        Remainder of the invest
ment : $ 13.1 USD
                                    Stock transaction: 13 - Check step
```

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                  3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['PG', 'SHEL', 'BP', 'ROG', 'MRK', 'CRM', 'AMGN', 'IBM', 'XOM', 'GS', 'NVDA', 'AXP',
'ABBV', 'CAT', 'HD']
                                    Stock transaction: 14 - Sell
                                    Stock transaction: 14 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 27.5 USD
                                    Stock transaction: 14 - Check step
                  3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['IBM', 'ROG', 'ABBV', 'XOM', 'TSM', 'AMGN', 'MA', 'GS', 'TRV', 'UNH', 'META', 'NVD
A', 'HON', 'AMZN', 'DD']
                                    Stock transaction: 15 - Sell
                                    Stock transaction: 15 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 32.6 USD
                                    Stock transaction: 15 - Check step
                  3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GE', 'AMGN', 'GOOG', 'META', 'CRM', 'TRV', 'TSM', 'MMM', 'MSFT', 'UNH', 'G
S', 'BA', 'AMZN', 'V']
                                    Stock transaction: 16 - Sell
                                    Stock transaction: 16 - Buy
                                                        New investment : $ 9980
00.0 USD
                                                        Remainder of the invest
ment : $ 75.7 USD
                                    Stock transaction: 16 - Check step
                                    Stock transaction: 16 - Final Sell
                                                       Processing time cost: 4.
29 minutes
                                    Stock transaction: 16 - Printing results for th
is scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 19
1 - Option : static
         2 - Price : open - 1 scenarios
                  3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-28 14:30:00 - ['E
NR', 'PG', 'NVS', 'WMT', 'TTE', 'PM', 'SHEL', 'TM', 'GE', 'TSM', 'MCD', 'BTI', 'SA
N', 'BP', 'GOOGL']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 4.96 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                        Processing time cost: 0.
298 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
```

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                                        *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-28 14:30:00 - ['T
TE', 'NVS', 'WMT', 'PG', 'ENR', 'BTI', 'PM', 'SHEL', 'GE', 'TM', 'TSM', 'ROG', 'ORC
L', 'UNH', 'GS']
                                       Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 5.52 USD
                                       Stock transaction: 1 - Check step
                                       Stock transaction: 1 - Final Sell
                                                            Processing time cost: 0.
303 minutes
                                       Stock transaction: 1 - Printing results for thi
s scenario
                                        *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 16 scenarios
                   3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'CVX', 'WMT', 'AAPL', 'NVDA', 'GE', 'UNH', 'INTC', 'MA', 'META', 'AXP', 'CRM',
'TTE', 'BTI', 'JPM']
                                       Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 3.38 USD
                                       Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['T
M', 'UNH', 'TSM', 'AMGN', 'MA', 'MSFT', 'BA', 'HD', 'GE', 'ROG', 'CVX', 'MMM', 'XO
M', 'PG', 'GOOGL']
                                       Stock transaction: 2 - Sell
                                       Stock transaction: 2 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 36.1 USD
                                       Stock transaction: 2 - Check step
                   3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'PEP', 'AXP', 'PM', 'GS', 'HD', 'UNH', 'META', 'MSFT', 'CAT', 'ABBV', 'IBM', 'AM
GN', 'TSM', 'ORCL']
                                       Stock transaction: 3 - Sell
                                       Stock transaction: 3 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 23.8 USD
                                       Stock transaction: 3 - Check step
                   3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['R
OG', 'NVDA', 'MSFT', 'MCD', 'HD', 'CRM', 'CAT', 'GE', 'IBM', 'PM', 'AXP', 'MA', 'PE
P', 'UNH', 'META']
                                       Stock transaction: 4 - Sell
                                       Stock transaction: 4 - Buy
```

```
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 73.3 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['C
VX', 'JNJ', 'PG', 'VZ', 'TRV', 'GE', 'GS', 'AXP', 'HD', 'PM', 'AMGN', 'UNH', 'META',
'MSFT', 'AMZN']
                                        Stock transaction: 5 - Sell
                                        Stock transaction: 5 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 6.08 USD
                                        Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'PM', 'GS', 'AMGN', 'MCD', 'META', 'TRV', 'AAPL', 'IBM', 'ABBV', 'GE', 'ORCL',
'HD', 'PEP', 'NVDA']
                                        Stock transaction: 6 - Sell
                                        Stock transaction: 6 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 76.8 USD
                                        Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'VZ', 'PG', 'GE', 'JNJ', 'TRV', 'UNH', 'TSM', 'XOM', 'MA', 'BA', 'MCD', 'AAP
L', 'META', 'GS']
                                        Stock transaction: 7 - Sell
                                        Stock transaction: 7 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 10.9 USD
                                        Stock transaction: 7 - Check step
                    3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['J
NJ', 'PEP', 'MMM', 'AAPL', 'MA', 'BA', 'IBM', 'NVDA', 'META', 'HON', 'PG', 'RY', 'V
Z', 'KO', 'WMT']
                                        Stock transaction: 8 - Sell
                                        Stock transaction: 8 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 29.8 USD
                                        Stock transaction: 8 - Check step
                    3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['P
EP', 'PM', 'META', 'ROG', 'TSM', 'AMGN', 'UNH', 'HD', 'HON', 'IBM', 'JNJ', 'MCD', 'V
Z', 'ALV', 'XOM']
                                        Stock transaction: 9 - Sell
                                        Stock transaction: 9 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 20.3 USD
                                        Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
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['PM', 'PG', 'MCD', 'GS', 'CRM', 'TRV', 'GOOGL', 'UNH', 'MRK', 'GOOG', 'ROG', 'BHP',
'ABBV', 'NVS', 'TM']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 52.9 USD
                                    Stock transaction: 10 - Check step
                  3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['HON', 'BA', 'JNJ', 'ALV', 'AMGN', 'MRK', 'AAPL', 'HD', 'UNH', 'IBM', 'MCD', 'MET
A', 'MSFT', 'TRV', 'ROG']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 57.3 USD
                                    Stock transaction: 11 - Check step
                  3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'HON', 'MSFT', 'PG', 'GS', 'HD', 'META', 'AMGN', 'UNH', 'MCD', 'IBM',
'CRM', 'TSM', 'NVDA']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 21.0 USD
                                    Stock transaction: 12 - Check step
                  3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['TSM', 'MMM', 'PG', 'NVDA', 'IBM', 'MCD', 'CVX', 'INTC', 'UNH', 'CAT', 'MSFT', 'AAP
L', 'ROG', 'BA', 'GOOGL']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 19.1 USD
                                    Stock transaction: 13 - Check step
                  3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['SHEL', 'PG', 'ENR', 'ROG', 'MRK', 'HON', 'META', 'CRM', 'AXP', 'SAN', 'VZ', 'PFE',
'BTI', 'GSK', 'HSBC']
                                    Stock transaction: 14 - Sell
                                    Stock transaction: 14 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 0.239 USD
                                    Stock transaction: 14 - Check step
                  3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['PEP', 'AMGN', 'ROG', 'TSM', 'UNH', 'ABBV', 'ALV', 'HD', 'GOOGL', 'CRM', 'GOOG', 'N
KE', 'CVX', 'TM', 'PG']
                                    Stock transaction: 15 - Sell
                                    Stock transaction: 15 - Buy
                                                        New investment : $ 1010
000.0 USD
```

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                                                                Remainder of the invest
ment : $ 22.2 USD
                                    Stock transaction: 15 - Check step
                    3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GOOG', 'PM', 'AMGN', 'TSM', 'META', 'MA', 'HD', 'MSFT', 'BA', 'GE', 'CAT',
'TRV', 'GOOGL', 'ABBV']
                                    Stock transaction: 16 - Sell
                                    Stock transaction: 16 - Buy
                                                                 New investment : $ 1010
000.0 USD
                                                                 Remainder of the invest
ment : $ 49.3 USD
                                    Stock transaction: 16 - Check step
                                    Stock transaction: 16 - Final Sell
                                                                Processing time cost: 4.
23 minutes
                                    Stock transaction: 16 - Printing results for th
is scenario
                                     *** RESULTS STORED***

          2 - Price : close - 16 scenarios
                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'BHP', 'CVX', 'GE', 'AAPL', 'MCD', 'UNH', 'MA', 'NVDA', 'META', 'AMGN', 'MMM',
'AMZN', 'GS', 'HON']
                                    Stock transaction: 1 - Fist Buy
                                                                Initial investment : $ 1
000000.0 USD
                                                                Remainder of the investm
ent : $ 38.0 USD
                                    Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['P
G', 'AMGN', 'MSFT', 'TSM', 'ROG', 'UNH', 'BA', 'AXP', 'XOM', 'HD', 'CVX', 'TRV', 'PE
P', 'HON', 'JPM']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                                 New investment : $ 1000
000.0 USD
                                                                 Remainder of the invest
ment : $ 57.5 USD
                                    Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'ENR', 'MRK', 'GS', 'PEP', 'HD', 'ALV', 'META', 'AMZN', 'NKE', 'BA', 'NVDA', 'UN
H', 'GOOGL', 'V']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                                 New investment : $ 1000
000.0 USD
                                                                 Remainder of the invest
ment : $ 8.54 USD
                                    Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['N
VDA', 'HD', 'ALV', 'META', 'MA', 'UNH', 'BA', 'MCD', 'AXP', 'PM', 'MSFT', 'CRM', 'GO
OG', 'TSM', 'JPM']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                                 New investment : $ 1000
```

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000.0 USD
                                                                Remainder of the invest
ment : $ 73.6 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['T
RV', 'PM', 'VZ', 'GS', 'CVX', 'HD', 'GE', 'MSFT', 'MCD', 'CRM', 'AXP', 'ALV', 'JNJ',
'MMM', 'AMZN']
                                        Stock transaction: 5 - Sell
                                        Stock transaction: 5 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 11.1 USD
                                        Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'META', 'GS', 'AMGN', 'PM', 'UNH', 'GE', 'GOOG', 'TRV', 'CRM', 'MMM', 'CAT', 'JP
M', 'TSM', 'HON']
                                        Stock transaction: 6 - Sell
                                        Stock transaction: 6 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 25.9 USD
                                        Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'ABBV', 'GE', 'UNH', 'TSM', 'TRV', 'MA', 'MMM', 'MCD', 'JNJ', 'VZ', 'ENR', 'ME
TA', 'NVS', 'HSBC']
                                        Stock transaction: 7 - Sell
                                        Stock transaction: 7 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 2.48 USD
                                        Stock transaction: 7 - Check step
                    3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['P
EP', 'ABBV', 'RY', 'TSM', 'BA', 'JNJ', 'AAPL', 'PG', 'META', 'NVDA', 'MA', 'HD', 'G
S', 'CAT', 'AMZN']
                                        Stock transaction: 8 - Sell
                                        Stock transaction: 8 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 123.0 USD
                                        Stock transaction: 8 - Check step
                    3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['M
ETA', 'UNH', 'HON', 'GS', 'IBM', 'CRM', 'MSFT', 'HD', 'ORCL', 'ABBV', 'BA', 'JNJ',
'AMGN', 'AMZN', 'V']
                                        Stock transaction: 9 - Sell
                                        Stock transaction: 9 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 9.31 USD
                                        Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'MMM', 'UNH', 'GS', 'CRM', 'META', 'JNJ', 'NVS', 'TM', 'BHP', 'H
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D', 'MRK', 'ROG']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 16.9 USD
                                    Stock transaction: 10 - Check step
                  3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['MRK', 'BA', 'AMGN', 'ABBV', 'HON', 'UNH', 'HD', 'AAPL', 'IBM', 'ROG', 'AXP', 'MC
D', 'TSM', 'NVS', 'GS']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 47.3 USD
                                    Stock transaction: 11 - Check step
                  3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'META', 'GS', 'IBM', 'SAN', 'DOW', 'MCD', 'C', 'ENR', 'PFE', 'BP', 'AL
V', 'GSK', 'HD']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 0.264 USD
                                    Stock transaction: 12 - Check step
                  3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['NVDA', 'MMM', 'TSM', 'INTC', 'IBM', 'PG', 'MCD', 'MSFT', 'UNH', 'PEP', 'ROG', 'CV
X', 'AAPL', 'META', 'BA']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                        New investment : $ 9990
00.0 USD
                                                        Remainder of the invest
ment : $ 13.1 USD
                                    Stock transaction: 13 - Check step
                  3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['PG', 'SHEL', 'BP', 'ROG', 'MRK', 'CRM', 'AMGN', 'IBM', 'XOM', 'GS', 'NVDA', 'AXP',
'ABBV', 'CAT', 'HD']
                                    Stock transaction: 14 - Sell
                                    Stock transaction: 14 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 27.5 USD
                                    Stock transaction: 14 - Check step
                  3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['IBM', 'ROG', 'ABBV', 'XOM', 'TSM', 'AMGN', 'MA', 'GS', 'TRV', 'UNH', 'META', 'NVD
A', 'HON', 'AMZN', 'DD']
                                    Stock transaction: 15 - Sell
                                    Stock transaction: 15 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
```

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ment : $ 32.6 USD
                                    Stock transaction: 15 - Check step
                    3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GE', 'AMGN', 'GOOG', 'META', 'CRM', 'TRV', 'TSM', 'MMM', 'MSFT', 'UNH', 'G
S', 'BA', 'AMZN', 'V']
                                    Stock transaction: 16 - Sell
                                    Stock transaction: 16 - Buy
                                                            New investment : $ 9980
00.0 USD
                                                            Remainder of the invest
ment : $ 75.7 USD
                                    Stock transaction: 16 - Check step
                                    Stock transaction: 16 - Final Sell
                                                           Processing time cost: 4.
23 minutes
                                    Stock transaction: 16 - Printing results for th
is scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 20
1 - Option : static
         2 - Price : open - 1 scenarios
                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-29 14:30:00 - ['E
NR', 'PG', 'WMT', 'HSBC', 'BUD', 'TTE', 'SHEL', 'NKE', 'TSM', 'TM', 'GE', 'HON', 'XO
M', 'PM', 'MCD']
                                    Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 47.9 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                            Processing time cost: 0.
324 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-29 14:30:00 - ['E
NR', 'BTI', 'WMT', 'PG', 'SHEL', 'HSBC', 'TTE', 'BUD', 'NKE', 'XOM', 'GE', 'TSM', 'T
M', 'ROG', 'PM']
                                    Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 3.73 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                            Processing time cost: 0.
284 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***
```

```
        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 19 scenarios
                   3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'CVX', 'WMT', 'AAPL', 'NVDA', 'GE', 'UNH', 'INTC', 'MA', 'META', 'AXP', 'CRM',
'TTE', 'BTI', 'JPM']
                                     Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                        Remainder of the investm
ent : $ 3.38 USD
                                     Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['T
M', 'UNH', 'TSM', 'AMGN', 'MA', 'MSFT', 'BA', 'HD', 'GE', 'ROG', 'CVX', 'MMM', 'XO
M', 'PG', 'GOOGL']
                                     Stock transaction: 2 - Sell
                                     Stock transaction: 2 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 36.1 USD
                                     Stock transaction: 2 - Check step
                   3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'PEP', 'AXP', 'PM', 'GS', 'HD', 'UNH', 'META', 'MSFT', 'CAT', 'ABBV', 'IBM', 'AM
GN', 'TSM', 'ORCL']
                                     Stock transaction: 3 - Sell
                                     Stock transaction: 3 - Buy
                                                         New investment : $ 1000
000.0 USD
                                                         Remainder of the invest
ment : $ 23.8 USD
                                     Stock transaction: 3 - Check step
                   3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['R
OG', 'NVDA', 'MSFT', 'MCD', 'HD', 'CRM', 'CAT', 'GE', 'IBM', 'PM', 'AXP', 'MA', 'PE
P', 'UNH', 'META']
                                     Stock transaction: 4 - Sell
                                     Stock transaction: 4 - Buy
                                                         New investment : $ 1010
000.0 USD
                                                         Remainder of the invest
ment : $ 73.3 USD
                                     Stock transaction: 4 - Check step
                   3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['C
VX', 'JNJ', 'PG', 'VZ', 'TRV', 'GE', 'GS', 'AXP', 'HD', 'PM', 'AMGN', 'UNH', 'META',
'MSFT', 'AMZN']
                                     Stock transaction: 5 - Sell
                                     Stock transaction: 5 - Buy
                                                         New investment : $ 1010
000.0 USD
                                                         Remainder of the invest
ment : $ 6.08 USD
                                     Stock transaction: 5 - Check step
                   3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'PM', 'GS', 'AMGN', 'MCD', 'META', 'TRV', 'AAPL', 'IBM', 'ABBV', 'GE', 'ORCL',
'HD', 'PEP', 'NVDA']
```

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                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 76.8 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'VZ', 'PG', 'GE', 'JNJ', 'TRV', 'UNH', 'TSM', 'XOM', 'MA', 'BA', 'MCD', 'AAP
L', 'META', 'GS']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 10.9 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['J
NJ', 'PEP', 'MMM', 'AAPL', 'MA', 'BA', 'IBM', 'NVDA', 'META', 'HON', 'PG', 'RY', 'V
Z', 'KO', 'WMT']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 29.8 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['P
EP', 'PM', 'META', 'ROG', 'TSM', 'AMGN', 'UNH', 'HD', 'HON', 'IBM', 'JNJ', 'MCD', 'V
Z', 'ALV', 'XOM']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 20.3 USD
                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'GS', 'CRM', 'TRV', 'GOOGL', 'UNH', 'MRK', 'GOOG', 'ROG', 'BHP',
'ABBV', 'NVS', 'TM']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 52.9 USD
                                    Stock transaction: 10 - Check step
                  3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['HON', 'BA', 'JNJ', 'ALV', 'AMGN', 'MRK', 'AAPL', 'HD', 'UNH', 'IBM', 'MCD', 'MET
A', 'MSFT', 'TRV', 'ROG']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 57.3 USD
```

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                                    Stock transaction: 11 - Check step
                  3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'HON', 'MSFT', 'PG', 'GS', 'HD', 'META', 'AMGN', 'UNH', 'MCD', 'IBM',
'CRM', 'TSM', 'NVDA']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 21.0 USD
                                    Stock transaction: 12 - Check step
                  3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['TSM', 'MMM', 'PG', 'NVDA', 'IBM', 'MCD', 'CVX', 'INTC', 'UNH', 'CAT', 'MSFT', 'AAP
L', 'ROG', 'BA', 'GOOGL']
                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 19.1 USD
                                    Stock transaction: 13 - Check step
                  3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['SHEL', 'PG', 'ENR', 'ROG', 'MRK', 'HON', 'META', 'CRM', 'AXP', 'SAN', 'VZ', 'PFE',
'BTI', 'GSK', 'HSBC']
                                    Stock transaction: 14 - Sell
                                    Stock transaction: 14 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 0.239 USD
                                    Stock transaction: 14 - Check step
                  3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['PEP', 'AMGN', 'ROG', 'TSM', 'UNH', 'ABBV', 'ALV', 'HD', 'GOOGL', 'CRM', 'GOOG', 'N
KE', 'CVX', 'TM', 'PG']
                                    Stock transaction: 15 - Sell
                                    Stock transaction: 15 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 22.2 USD
                                    Stock transaction: 15 - Check step
                  3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GOOG', 'PM', 'AMGN', 'TSM', 'META', 'MA', 'HD', 'MSFT', 'BA', 'GE', 'CAT',
'TRV', 'GOOGL', 'ABBV']
                                    Stock transaction: 16 - Sell
                                    Stock transaction: 16 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 49.3 USD
                                    Stock transaction: 16 - Check step
                  3 - Scenario 17 : 2024-10-28 16:30:00 to 2024-10-28 18:30:00 -
['ROG', 'HON', 'GOOGL', 'UNH', 'GS', 'MA', 'AMGN', 'META', 'HD', 'MCD', 'PM', 'TRV',
'NVDA', 'PG', 'DIS']
                                    Stock transaction: 17 - Sell
                                    Stock transaction: 17 - Buy
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                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 33.1 USD
                                        Stock transaction: 17 - Check step
                    3 - Scenario 18 : 2024-10-28 18:30:00 to 2024-10-29 14:30:00 -
['JPM', 'META', 'MA', 'BA', 'GS', 'CAT', 'UNH', 'AXP', 'NVDA', 'HD', 'HON', 'TSM',
'ORCL', 'ROG', 'CRM']
                                        Stock transaction: 18 - Sell
                                        Stock transaction: 18 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 36.3 USD
                                        Stock transaction: 18 - Check step
                    3 - Scenario 19 : 2024-10-29 14:30:00 to 2024-10-29 16:30:00 -
['ORCL', 'AMGN', 'NVS', 'MSFT', 'CRM', 'GS', 'JPM', 'META', 'UNH', 'MRK', 'HD', 'MC
D', 'PFE', 'TRV', 'HSBC']
                                        Stock transaction: 19 - Sell
                                        Stock transaction: 19 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 12.1 USD
                                        Stock transaction: 19 - Check step
                                        Stock transaction: 19 - Final Sell
                                                               Processing time cost: 4.
98 minutes
                                        Stock transaction: 19 - Printing results for th
is scenario
                                         *** RESULTS STORED***

          2 - Price : close - 19 scenarios
                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'BHP', 'CVX', 'GE', 'AAPL', 'MCD', 'UNH', 'MA', 'NVDA', 'META', 'AMGN', 'MMM',
'AMZN', 'GS', 'HON']
                                        Stock transaction: 1 - Fist Buy
                                                                Initial investment : $ 1
000000.0 USD
                                                                Remainder of the investm
ent : $ 38.0 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['P
G', 'AMGN', 'MSFT', 'TSM', 'ROG', 'UNH', 'BA', 'AXP', 'XOM', 'HD', 'CVX', 'TRV', 'PE
P', 'HON', 'JPM']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 57.5 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'ENR', 'MRK', 'GS', 'PEP', 'HD', 'ALV', 'META', 'AMZN', 'NKE', 'BA', 'NVDA', 'UN
H', 'GOOGL', 'V']
                                        Stock transaction: 3 - Sell
```

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                                    Stock transaction: 3 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 8.54 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['N
VDA', 'HD', 'ALV', 'META', 'MA', 'UNH', 'BA', 'MCD', 'AXP', 'PM', 'MSFT', 'CRM', 'GO
OG', 'TSM', 'JPM']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 73.6 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['T
RV', 'PM', 'VZ', 'GS', 'CVX', 'HD', 'GE', 'MSFT', 'MCD', 'CRM', 'AXP', 'ALV', 'JNJ',
'MMM', 'AMZN']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 11.1 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'META', 'GS', 'AMGN', 'PM', 'UNH', 'GE', 'GOOG', 'TRV', 'CRM', 'MMM', 'CAT', 'JP
M', 'TSM', 'HON']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 25.9 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'ABBV', 'GE', 'UNH', 'TSM', 'TRV', 'MA', 'MMM', 'MCD', 'JNJ', 'VZ', 'ENR', 'ME
TA', 'NVS', 'HSBC']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 2.48 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['P
EP', 'ABBV', 'RY', 'TSM', 'BA', 'JNJ', 'AAPL', 'PG', 'META', 'NVDA', 'MA', 'HD', 'G
S', 'CAT', 'AMZN']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 123.0 USD
                                    Stock transaction: 8 - Check step
```

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                    3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['M
ETA', 'UNH', 'HON', 'GS', 'IBM', 'CRM', 'MSFT', 'HD', 'ORCL', 'ABBV', 'BA', 'JNJ',
'AMGN', 'AMZN', 'V']
                                        Stock transaction: 9 - Sell
                                        Stock transaction: 9 - Buy
                                                              New investment : $ 1010
000.0 USD
                                                              Remainder of the invest
ment : $ 9.31 USD
                                        Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'MMM', 'UNH', 'GS', 'CRM', 'META', 'JNJ', 'NVS', 'TM', 'BHP', 'H
D', 'MRK', 'ROG']
                                        Stock transaction: 10 - Sell
                                        Stock transaction: 10 - Buy
                                                              New investment : $ 1000
000.0 USD
                                                              Remainder of the invest
ment : $ 16.9 USD
                                        Stock transaction: 10 - Check step
                    3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['MRK', 'BA', 'AMGN', 'ABBV', 'HON', 'UNH', 'HD', 'AAPL', 'IBM', 'ROG', 'AXP', 'MC
D', 'TSM', 'NVS', 'GS']
                                        Stock transaction: 11 - Sell
                                        Stock transaction: 11 - Buy
                                                              New investment : $ 1000
000.0 USD
                                                              Remainder of the invest
ment : $ 47.3 USD
                                        Stock transaction: 11 - Check step
                    3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'META', 'GS', 'IBM', 'SAN', 'DOW', 'MCD', 'C', 'ENR', 'PFE', 'BP', 'AL
V', 'GSK', 'HD']
                                        Stock transaction: 12 - Sell
                                        Stock transaction: 12 - Buy
                                                              New investment : $ 1000
000.0 USD
                                                              Remainder of the invest
ment : $ 0.264 USD
                                        Stock transaction: 12 - Check step
                    3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['NVDA', 'MMM', 'TSM', 'INTC', 'IBM', 'PG', 'MCD', 'MSFT', 'UNH', 'PEP', 'ROG', 'CV
X', 'AAPL', 'META', 'BA']
                                        Stock transaction: 13 - Sell
                                        Stock transaction: 13 - Buy
                                                              New investment : $ 9990
00.0 USD
                                                              Remainder of the invest
ment : $ 13.1 USD
                                        Stock transaction: 13 - Check step
                    3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['PG', 'SHEL', 'BP', 'ROG', 'MRK', 'CRM', 'AMGN', 'IBM', 'XOM', 'GS', 'NVDA', 'AXP',
'ABBV', 'CAT', 'HD']
                                        Stock transaction: 14 - Sell
                                        Stock transaction: 14 - Buy
                                                              New investment : $ 1000
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000.0 USD
                                                                Remainder of the invest
ment : $ 27.5 USD
                                        Stock transaction: 14 - Check step
                    3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['IBM', 'ROG', 'ABBV', 'XOM', 'TSM', 'AMGN', 'MA', 'GS', 'TRV', 'UNH', 'META', 'NVD
A', 'HON', 'AMZN', 'DD']
                                        Stock transaction: 15 - Sell
                                        Stock transaction: 15 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 32.6 USD
                                        Stock transaction: 15 - Check step
                    3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GE', 'AMGN', 'GOOG', 'META', 'CRM', 'TRV', 'TSM', 'MMM', 'MSFT', 'UNH', 'G
S', 'BA', 'AMZN', 'V']
                                        Stock transaction: 16 - Sell
                                        Stock transaction: 16 - Buy
                                                                New investment : $ 9980
00.0 USD
                                                                Remainder of the invest
ment : $ 75.7 USD
                                        Stock transaction: 16 - Check step
                    3 - Scenario 17 : 2024-10-28 16:30:00 to 2024-10-28 18:30:00 -
['ROG', 'HD', 'HON', 'PM', 'XOM', 'BA', 'MSFT', 'META', 'MCD', 'GS', 'AXP', 'NVDA',
'AMGN', 'TSM', 'RY']
                                        Stock transaction: 17 - Sell
                                        Stock transaction: 17 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 111.0 USD
                                        Stock transaction: 17 - Check step
                    3 - Scenario 18 : 2024-10-28 18:30:00 to 2024-10-29 14:30:00 -
['PM', 'HD', 'JPM', 'MA', 'META', 'AMGN', 'GS', 'NVDA', 'TRV', 'CAT', 'ROG', 'AXP',
'NVS', 'GE', 'HON']
                                        Stock transaction: 18 - Sell
                                        Stock transaction: 18 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 1.36 USD
                                        Stock transaction: 18 - Check step
                    3 - Scenario 19 : 2024-10-29 14:30:00 to 2024-10-29 16:30:00 -
['MSFT', 'MRK', 'AMGN', 'CRM', 'GS', 'IBM', 'META', 'BA', 'AAPL', 'NVS', 'HD', 'UN
H', 'CVX', 'TM', 'HON']
                                        Stock transaction: 19 - Sell
                                        Stock transaction: 19 - Buy
                                                                New investment : $ 9970
00.0 USD
                                                                Remainder of the invest
ment : $ 4.73 USD
                                        Stock transaction: 19 - Check step
                                        Stock transaction: 19 - Final Sell
                                                               Processing time cost: 5.
```

```
01 minutes
                                    Stock transaction: 19 - Printing results for th
is scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 21
1 - Option : static
         2 - Price : open - 1 scenarios
                   3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-30 14:30:00 - ['E
NR', 'HSBC', 'PG', 'WMT', 'SHEL', 'NKE', 'GOOGL', 'PM', 'CSCO', 'VZ', 'GE', 'TSM',
'BUD', 'HON', 'PFE']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 9.48 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
296 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

         2 - Price : close - 1 scenarios
                   3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-30 14:30:00 - ['E
NR', 'HSBC', 'PG', 'WMT', 'SHEL', 'CSCO', 'PFE', 'GOOGL', 'NKE', 'PM', 'BUD', 'GE',
'TTE', 'TSM', 'ROG']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 0.0428 USD
                                    Stock transaction: 1 - Check step
                                    Stock transaction: 1 - Final Sell
                                                          Processing time cost: 0.
29 minutes
                                    Stock transaction: 1 - Printing results for thi
s scenario
                                     *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
         2 - Price : open - 22 scenarios
                   3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'CVX', 'WMT', 'AAPL', 'NVDA', 'GE', 'UNH', 'INTC', 'MA', 'META', 'AXP', 'CRM',
'TTE', 'BTI', 'JPM']
                                    Stock transaction: 1 - Fist Buy
                                                          Initial investment : $ 1
000000.0 USD
                                                          Remainder of the investm
ent : $ 3.38 USD
                                    Stock transaction: 1 - Check step
                   3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['T
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M', 'UNH', 'TSM', 'AMGN', 'MA', 'MSFT', 'BA', 'HD', 'GE', 'ROG', 'CVX', 'MMM', 'XO
M', 'PG', 'GOOGL']
                                    Stock transaction: 2 - Sell
                                    Stock transaction: 2 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 36.1 USD
                                    Stock transaction: 2 - Check step
                  3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'PEP', 'AXP', 'PM', 'GS', 'HD', 'UNH', 'META', 'MSFT', 'CAT', 'ABBV', 'IBM', 'AM
GN', 'TSM', 'ORCL']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 23.8 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['R
OG', 'NVDA', 'MSFT', 'MCD', 'HD', 'CRM', 'CAT', 'GE', 'IBM', 'PM', 'AXP', 'MA', 'PE
P', 'UNH', 'META']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 73.3 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['C
VX', 'JNJ', 'PG', 'VZ', 'TRV', 'GE', 'GS', 'AXP', 'HD', 'PM', 'AMGN', 'UNH', 'META',
'MSFT', 'AMZN']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 6.08 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'PM', 'GS', 'AMGN', 'MCD', 'META', 'TRV', 'AAPL', 'IBM', 'ABBV', 'GE', 'ORCL',
'HD', 'PEP', 'NVDA']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 76.8 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'VZ', 'PG', 'GE', 'JNJ', 'TRV', 'UNH', 'TSM', 'XOM', 'MA', 'BA', 'MCD', 'AAP
L', 'META', 'GS']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1010
000.0 USD
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                                                                Remainder of the invest
ment : $ 10.9 USD
                                        Stock transaction: 7 - Check step
                    3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['J
NJ', 'PEP', 'MMM', 'AAPL', 'MA', 'BA', 'IBM', 'NVDA', 'META', 'HON', 'PG', 'RY', 'V
Z', 'KO', 'WMT']
                                        Stock transaction: 8 - Sell
                                        Stock transaction: 8 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 29.8 USD
                                        Stock transaction: 8 - Check step
                    3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['P
EP', 'PM', 'META', 'ROG', 'TSM', 'AMGN', 'UNH', 'HD', 'HON', 'IBM', 'JNJ', 'MCD', 'V
Z', 'ALV', 'XOM']
                                        Stock transaction: 9 - Sell
                                        Stock transaction: 9 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 20.3 USD
                                        Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'GS', 'CRM', 'TRV', 'GOOGL', 'UNH', 'MRK', 'GOOG', 'ROG', 'BHP',
'ABBV', 'NVS', 'TM']
                                        Stock transaction: 10 - Sell
                                        Stock transaction: 10 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 52.9 USD
                                        Stock transaction: 10 - Check step
                    3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['HON', 'BA', 'JNJ', 'ALV', 'AMGN', 'MRK', 'AAPL', 'HD', 'UNH', 'IBM', 'MCD', 'MET
A', 'MSFT', 'TRV', 'ROG']
                                        Stock transaction: 11 - Sell
                                        Stock transaction: 11 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 57.3 USD
                                        Stock transaction: 11 - Check step
                    3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'HON', 'MSFT', 'PG', 'GS', 'HD', 'META', 'AMGN', 'UNH', 'MCD', 'IBM',
'CRM', 'TSM', 'NVDA']
                                        Stock transaction: 12 - Sell
                                        Stock transaction: 12 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 21.0 USD
                                        Stock transaction: 12 - Check step
                    3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['TSM', 'MMM', 'PG', 'NVDA', 'IBM', 'MCD', 'CVX', 'INTC', 'UNH', 'CAT', 'MSFT', 'AAP
L', 'ROG', 'BA', 'GOOGL']
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                                    Stock transaction: 13 - Sell
                                    Stock transaction: 13 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 19.1 USD
                                    Stock transaction: 13 - Check step
                  3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['SHEL', 'PG', 'ENR', 'ROG', 'MRK', 'HON', 'META', 'CRM', 'AXP', 'SAN', 'VZ', 'PFE',
'BTI', 'GSK', 'HSBC']
                                    Stock transaction: 14 - Sell
                                    Stock transaction: 14 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 0.239 USD
                                    Stock transaction: 14 - Check step
                  3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['PEP', 'AMGN', 'ROG', 'TSM', 'UNH', 'ABBV', 'ALV', 'HD', 'GOOGL', 'CRM', 'GOOG', 'N
KE', 'CVX', 'TM', 'PG']
                                    Stock transaction: 15 - Sell
                                    Stock transaction: 15 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 22.2 USD
                                    Stock transaction: 15 - Check step
                  3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GOOG', 'PM', 'AMGN', 'TSM', 'META', 'MA', 'HD', 'MSFT', 'BA', 'GE', 'CAT',
'TRV', 'GOOGL', 'ABBV']
                                    Stock transaction: 16 - Sell
                                    Stock transaction: 16 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 49.3 USD
                                    Stock transaction: 16 - Check step
                  3 - Scenario 17 : 2024-10-28 16:30:00 to 2024-10-28 18:30:00 -
['ROG', 'HON', 'GOOGL', 'UNH', 'GS', 'MA', 'AMGN', 'META', 'HD', 'MCD', 'PM', 'TRV',
'NVDA', 'PG', 'DIS']
                                    Stock transaction: 17 - Sell
                                    Stock transaction: 17 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 33.1 USD
                                    Stock transaction: 17 - Check step
                  3 - Scenario 18 : 2024-10-28 18:30:00 to 2024-10-29 14:30:00 -
['JPM', 'META', 'MA', 'BA', 'GS', 'CAT', 'UNH', 'AXP', 'NVDA', 'HD', 'HON', 'TSM',
'ORCL', 'ROG', 'CRM']
                                    Stock transaction: 18 - Sell
                                    Stock transaction: 18 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 36.3 USD
```

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                                    Stock transaction: 18 - Check step
                  3 - Scenario 19 : 2024-10-29 14:30:00 to 2024-10-29 16:30:00 -
['ORCL', 'AMGN', 'NVS', 'MSFT', 'CRM', 'GS', 'JPM', 'META', 'UNH', 'MRK', 'HD', 'MC
D', 'PFE', 'TRV', 'HSBC']
                                    Stock transaction: 19 - Sell
                                    Stock transaction: 19 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 12.1 USD
                                    Stock transaction: 19 - Check step
                  3 - Scenario 20 : 2024-10-29 16:30:00 to 2024-10-29 18:30:00 -
['ABBV', 'KO', 'ROG', 'HON', 'BA', 'GS', 'META', 'UNH', 'HD', 'DOW', 'WMT', 'BTI',
'DD', 'PFE', 'GSK']
                                    Stock transaction: 20 - Sell
                                    Stock transaction: 20 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 2.05 USD
                                    Stock transaction: 20 - Check step
                  3 - Scenario 21 : 2024-10-29 18:30:00 to 2024-10-30 14:30:00 -
['PM', 'CAT', 'UNH', 'CRM', 'META', 'GS', 'TSM', 'MCD', 'V', 'IBM', 'ROG', 'MA', 'MS
FT', 'HON', 'NVDA']
                                    Stock transaction: 21 - Sell
                                    Stock transaction: 21 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 11.5 USD
                                    Stock transaction: 21 - Check step
                  3 - Scenario 22 : 2024-10-30 14:30:00 to 2024-10-30 16:30:00 -
['JPM', 'MSFT', 'IBM', 'V', 'TRV', 'GS', 'UNH', 'MCD', 'MA', 'CAT', 'CRM', 'NVS', 'A
XP', 'ALV', 'C']
                                    Stock transaction: 22 - Sell
                                    Stock transaction: 22 - Buy
                                                        New investment : $ 9990
00.0 USD
                                                        Remainder of the invest
ment : $ 2.13 USD
                                    Stock transaction: 22 - Check step
                                    Stock transaction: 22 - Final Sell
                                                       Processing time cost: 5.
83 minutes
                                    Stock transaction: 22 - Printing results for th
is scenario
                                     *** RESULTS STORED***

         2 - Price : close - 22 scenarios
                  3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'BHP', 'CVX', 'GE', 'AAPL', 'MCD', 'UNH', 'MA', 'NVDA', 'META', 'AMGN', 'MMM',
'AMZN', 'GS', 'HON']
                                    Stock transaction: 1 - Fist Buy
                                                        Initial investment : $ 1
000000.0 USD
                                                       Remainder of the investm
```

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ent : $ 38.0 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['P
G', 'AMGN', 'MSFT', 'TSM', 'ROG', 'UNH', 'BA', 'AXP', 'XOM', 'HD', 'CVX', 'TRV', 'PE
P', 'HON', 'JPM']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 57.5 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'ENR', 'MRK', 'GS', 'PEP', 'HD', 'ALV', 'META', 'AMZN', 'NKE', 'BA', 'NVDA', 'UN
H', 'GOOGL', 'V']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 8.54 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['N
VDA', 'HD', 'ALV', 'META', 'MA', 'UNH', 'BA', 'MCD', 'AXP', 'PM', 'MSFT', 'CRM', 'GO
OG', 'TSM', 'JPM']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 73.6 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['T
RV', 'PM', 'VZ', 'GS', 'CVX', 'HD', 'GE', 'MSFT', 'MCD', 'CRM', 'AXP', 'ALV', 'JNJ',
'MMM', 'AMZN']
                                        Stock transaction: 5 - Sell
                                        Stock transaction: 5 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 11.1 USD
                                        Stock transaction: 5 - Check step
                    3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'META', 'GS', 'AMGN', 'PM', 'UNH', 'GE', 'GOOG', 'TRV', 'CRM', 'MMM', 'CAT', 'JP
M', 'TSM', 'HON']
                                        Stock transaction: 6 - Sell
                                        Stock transaction: 6 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 25.9 USD
                                        Stock transaction: 6 - Check step
                    3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'ABBV', 'GE', 'UNH', 'TSM', 'TRV', 'MA', 'MMM', 'MCD', 'JNJ', 'VZ', 'ENR', 'ME
TA', 'NVS', 'HSBC']
                                        Stock transaction: 7 - Sell
```

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                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 2.48 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['P
EP', 'ABBV', 'RY', 'TSM', 'BA', 'JNJ', 'AAPL', 'PG', 'META', 'NVDA', 'MA', 'HD', 'G
S', 'CAT', 'AMZN']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 123.0 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['M
ETA', 'UNH', 'HON', 'GS', 'IBM', 'CRM', 'MSFT', 'HD', 'ORCL', 'ABBV', 'BA', 'JNJ',
'AMGN', 'AMZN', 'V']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 9.31 USD
                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'MMM', 'UNH', 'GS', 'CRM', 'META', 'JNJ', 'NVS', 'TM', 'BHP', 'H
D', 'MRK', 'ROG']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 16.9 USD
                                    Stock transaction: 10 - Check step
                  3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['MRK', 'BA', 'AMGN', 'ABBV', 'HON', 'UNH', 'HD', 'AAPL', 'IBM', 'ROG', 'AXP', 'MC
D', 'TSM', 'NVS', 'GS']
                                    Stock transaction: 11 - Sell
                                    Stock transaction: 11 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 47.3 USD
                                    Stock transaction: 11 - Check step
                  3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'META', 'GS', 'IBM', 'SAN', 'DOW', 'MCD', 'C', 'ENR', 'PFE', 'BP', 'AL
V', 'GSK', 'HD']
                                    Stock transaction: 12 - Sell
                                    Stock transaction: 12 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 0.264 USD
                                    Stock transaction: 12 - Check step
```

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                    3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['NVDA', 'MMM', 'TSM', 'INTC', 'IBM', 'PG', 'MCD', 'MSFT', 'UNH', 'PEP', 'ROG', 'CV
X', 'AAPL', 'META', 'BA']
                                        Stock transaction: 13 - Sell
                                        Stock transaction: 13 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 13.1 USD
                                        Stock transaction: 13 - Check step
                    3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['PG', 'SHEL', 'BP', 'ROG', 'MRK', 'CRM', 'AMGN', 'IBM', 'XOM', 'GS', 'NVDA', 'AXP',
'ABBV', 'CAT', 'HD']
                                        Stock transaction: 14 - Sell
                                        Stock transaction: 14 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 27.5 USD
                                        Stock transaction: 14 - Check step
                    3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['IBM', 'ROG', 'ABBV', 'XOM', 'TSM', 'AMGN', 'MA', 'GS', 'TRV', 'UNH', 'META', 'NVD
A', 'HON', 'AMZN', 'DD']
                                        Stock transaction: 15 - Sell
                                        Stock transaction: 15 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 32.6 USD
                                        Stock transaction: 15 - Check step
                    3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GE', 'AMGN', 'GOOG', 'META', 'CRM', 'TRV', 'TSM', 'MMM', 'MSFT', 'UNH', 'G
S', 'BA', 'AMZN', 'V']
                                        Stock transaction: 16 - Sell
                                        Stock transaction: 16 - Buy
                                                                New investment : $ 9980
00.0 USD
                                                                Remainder of the invest
ment : $ 75.7 USD
                                        Stock transaction: 16 - Check step
                    3 - Scenario 17 : 2024-10-28 16:30:00 to 2024-10-28 18:30:00 -
['ROG', 'HD', 'HON', 'PM', 'XOM', 'BA', 'MSFT', 'META', 'MCD', 'GS', 'AXP', 'NVDA',
'AMGN', 'TSM', 'RY']
                                        Stock transaction: 17 - Sell
                                        Stock transaction: 17 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 111.0 USD
                                        Stock transaction: 17 - Check step
                    3 - Scenario 18 : 2024-10-28 18:30:00 to 2024-10-29 14:30:00 -
['PM', 'HD', 'JPM', 'MA', 'META', 'AMGN', 'GS', 'NVDA', 'TRV', 'CAT', 'ROG', 'AXP',
'NVS', 'GE', 'HON']
                                        Stock transaction: 18 - Sell
                                        Stock transaction: 18 - Buy
                                                                New investment : $ 9990
```

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00.0 USD
                                                                Remainder of the invest
ment : $ 1.36 USD
                                    Stock transaction: 18 - Check step
                  3 - Scenario 19 : 2024-10-29 14:30:00 to 2024-10-29 16:30:00 -
['MSFT', 'MRK', 'AMGN', 'CRM', 'GS', 'IBM', 'META', 'BA', 'AAPL', 'NVS', 'HD', 'UN
H', 'CVX', 'TM', 'HON']
                                    Stock transaction: 19 - Sell
                                    Stock transaction: 19 - Buy
                                                                New investment : $ 9970
00.0 USD
                                                                Remainder of the invest
ment : $ 4.73 USD
                                    Stock transaction: 19 - Check step
                  3 - Scenario 20 : 2024-10-29 16:30:00 to 2024-10-29 18:30:00 -
['BTI', 'WMT', 'DD', 'DOW', 'ABBV', 'HON', 'ROG', 'META', 'BA', 'GS', 'HD', 'UNH',
'IBM', 'MCD', 'MSFT']
                                    Stock transaction: 20 - Sell
                                    Stock transaction: 20 - Buy
                                                                New investment : $ 9970
00.0 USD
                                                                Remainder of the invest
ment : $ 16.7 USD
                                    Stock transaction: 20 - Check step
                  3 - Scenario 21 : 2024-10-29 18:30:00 to 2024-10-30 14:30:00 -
['CAT', 'UNH', 'GS', 'MCD', 'AAPL', 'PM', 'AMGN', 'META', 'MA', 'TSM', 'BA', 'V', 'H
D', 'AMZN', 'GOOG']
                                    Stock transaction: 21 - Sell
                                    Stock transaction: 21 - Buy
                                                                New investment : $ 9980
00.0 USD
                                                                Remainder of the invest
ment : $ 94.7 USD
                                    Stock transaction: 21 - Check step
                  3 - Scenario 22 : 2024-10-30 14:30:00 to 2024-10-30 16:30:00 -
['JPM', 'CRM', 'IBM', 'ORCL', 'AXP', 'MSFT', 'UNH', 'GE', 'ABBV', 'GOOGL', 'MA',
'V', 'TRV', 'CAT', 'MCD']
                                    Stock transaction: 22 - Sell
                                    Stock transaction: 22 - Buy
                                                                New investment : $ 9960
00.0 USD
                                                                Remainder of the invest
ment : $ 90.5 USD
                                    Stock transaction: 22 - Check step
                                    Stock transaction: 22 - Final Sell
                                                               Processing time cost: 5.
84 minutes
                                    Stock transaction: 22 - Printing results for th
is scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 22
1 - Option : static
         2 - Price : open - 1 scenarios
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                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-31 14:30:00 - ['E
NR', 'HSBC', 'SHEL', 'PFE', 'PG', 'VZ', 'WMT', 'PM', 'TSM', 'ABBV', 'GOOGL', 'GE',
'HON', 'NKE', 'IBM']
                                        Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 25.5 USD
                                        Stock transaction: 1 - Check step
                                        Stock transaction: 1 - Final Sell
                                                            Processing time cost: 0.
314 minutes
                                        Stock transaction: 1 - Printing results for thi
s scenario
                                         *** RESULTS STORED***

          2 - Price : close - 1 scenarios
                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-31 14:30:00 - ['H
SBC', 'ENR', 'SHEL', 'PFE', 'PG', 'WMT', 'VZ', 'PM', 'GE', 'TSM', 'ABBV', 'ROG', 'GO
OGL', 'V', 'HON']
                                        Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 46.5 USD
                                        Stock transaction: 1 - Check step
                                        Stock transaction: 1 - Final Sell
                                                            Processing time cost: 0.
31 minutes
                                        Stock transaction: 1 - Printing results for thi
s scenario
                                         *** RESULTS STORED***

        End of transactions for static scenario
1 - Option : variable
          2 - Price : open - 25 scenarios
                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'CVX', 'WMT', 'AAPL', 'NVDA', 'GE', 'UNH', 'INTC', 'MA', 'META', 'AXP', 'CRM',
'TTE', 'BTI', 'JPM']
                                        Stock transaction: 1 - Fist Buy
                                                            Initial investment : $ 1
000000.0 USD
                                                            Remainder of the investm
ent : $ 3.38 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['T
M', 'UNH', 'TSM', 'AMGN', 'MA', 'MSFT', 'BA', 'HD', 'GE', 'ROG', 'CVX', 'MMM', 'XO
M', 'PG', 'GOOGL']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                             New investment : $ 1000
000.0 USD
                                                             Remainder of the invest
ment : $ 36.1 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
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M', 'PEP', 'AXP', 'PM', 'GS', 'HD', 'UNH', 'META', 'MSFT', 'CAT', 'ABBV', 'IBM', 'AM
GN', 'TSM', 'ORCL']
                                    Stock transaction: 3 - Sell
                                    Stock transaction: 3 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 23.8 USD
                                    Stock transaction: 3 - Check step
                  3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['R
OG', 'NVDA', 'MSFT', 'MCD', 'HD', 'CRM', 'CAT', 'GE', 'IBM', 'PM', 'AXP', 'MA', 'PE
P', 'UNH', 'META']
                                    Stock transaction: 4 - Sell
                                    Stock transaction: 4 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 73.3 USD
                                    Stock transaction: 4 - Check step
                  3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['C
VX', 'JNJ', 'PG', 'VZ', 'TRV', 'GE', 'GS', 'AXP', 'HD', 'PM', 'AMGN', 'UNH', 'META',
'MSFT', 'AMZN']
                                    Stock transaction: 5 - Sell
                                    Stock transaction: 5 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 6.08 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'PM', 'GS', 'AMGN', 'MCD', 'META', 'TRV', 'AAPL', 'IBM', 'ABBV', 'GE', 'ORCL',
'HD', 'PEP', 'NVDA']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 76.8 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'VZ', 'PG', 'GE', 'JNJ', 'TRV', 'UNH', 'TSM', 'XOM', 'MA', 'BA', 'MCD', 'AAP
L', 'META', 'GS']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 10.9 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['J
NJ', 'PEP', 'MMM', 'AAPL', 'MA', 'BA', 'IBM', 'NVDA', 'META', 'HON', 'PG', 'RY', 'V
Z', 'KO', 'WMT']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                          New investment : $ 1010
000.0 USD
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                                                                Remainder of the invest
ment : $ 29.8 USD
                                        Stock transaction: 8 - Check step
                    3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['P
EP', 'PM', 'META', 'ROG', 'TSM', 'AMGN', 'UNH', 'HD', 'HON', 'IBM', 'JNJ', 'MCD', 'V
Z', 'ALV', 'XOM']
                                        Stock transaction: 9 - Sell
                                        Stock transaction: 9 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 20.3 USD
                                        Stock transaction: 9 - Check step
                    3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'GS', 'CRM', 'TRV', 'GOOGL', 'UNH', 'MRK', 'GOOG', 'ROG', 'BHP',
'ABBV', 'NVS', 'TM']
                                        Stock transaction: 10 - Sell
                                        Stock transaction: 10 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 52.9 USD
                                        Stock transaction: 10 - Check step
                    3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['HON', 'BA', 'JNJ', 'ALV', 'AMGN', 'MRK', 'AAPL', 'HD', 'UNH', 'IBM', 'MCD', 'MET
A', 'MSFT', 'TRV', 'ROG']
                                        Stock transaction: 11 - Sell
                                        Stock transaction: 11 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 57.3 USD
                                        Stock transaction: 11 - Check step
                    3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'HON', 'MSFT', 'PG', 'GS', 'HD', 'META', 'AMGN', 'UNH', 'MCD', 'IBM',
'CRM', 'TSM', 'NVDA']
                                        Stock transaction: 12 - Sell
                                        Stock transaction: 12 - Buy
                                                                New investment : $ 1010
000.0 USD
                                                                Remainder of the invest
ment : $ 21.0 USD
                                        Stock transaction: 12 - Check step
                    3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['TSM', 'MMM', 'PG', 'NVDA', 'IBM', 'MCD', 'CVX', 'INTC', 'UNH', 'CAT', 'MSFT', 'AAP
L', 'ROG', 'BA', 'GOOGL']
                                        Stock transaction: 13 - Sell
                                        Stock transaction: 13 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 19.1 USD
                                        Stock transaction: 13 - Check step
                    3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['SHEL', 'PG', 'ENR', 'ROG', 'MRK', 'HON', 'META', 'CRM', 'AXP', 'SAN', 'VZ', 'PFE',
'BTI', 'GSK', 'HSBC']
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                                    Stock transaction: 14 - Sell
                                    Stock transaction: 14 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 0.239 USD
                                    Stock transaction: 14 - Check step
                  3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['PEP', 'AMGN', 'ROG', 'TSM', 'UNH', 'ABBV', 'ALV', 'HD', 'GOOGL', 'CRM', 'GOOG', 'N
KE', 'CVX', 'TM', 'PG']
                                    Stock transaction: 15 - Sell
                                    Stock transaction: 15 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 22.2 USD
                                    Stock transaction: 15 - Check step
                  3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GOOG', 'PM', 'AMGN', 'TSM', 'META', 'MA', 'HD', 'MSFT', 'BA', 'GE', 'CAT',
'TRV', 'GOOGL', 'ABBV']
                                    Stock transaction: 16 - Sell
                                    Stock transaction: 16 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 49.3 USD
                                    Stock transaction: 16 - Check step
                  3 - Scenario 17 : 2024-10-28 16:30:00 to 2024-10-28 18:30:00 -
['ROG', 'HON', 'GOOGL', 'UNH', 'GS', 'MA', 'AMGN', 'META', 'HD', 'MCD', 'PM', 'TRV',
'NVDA', 'PG', 'DIS']
                                    Stock transaction: 17 - Sell
                                    Stock transaction: 17 - Buy
                                                          New investment : $ 1010
000.0 USD
                                                          Remainder of the invest
ment : $ 33.1 USD
                                    Stock transaction: 17 - Check step
                  3 - Scenario 18 : 2024-10-28 18:30:00 to 2024-10-29 14:30:00 -
['JPM', 'META', 'MA', 'BA', 'GS', 'CAT', 'UNH', 'AXP', 'NVDA', 'HD', 'HON', 'TSM',
'ORCL', 'ROG', 'CRM']
                                    Stock transaction: 18 - Sell
                                    Stock transaction: 18 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 36.3 USD
                                    Stock transaction: 18 - Check step
                  3 - Scenario 19 : 2024-10-29 14:30:00 to 2024-10-29 16:30:00 -
['ORCL', 'AMGN', 'NVS', 'MSFT', 'CRM', 'GS', 'JPM', 'META', 'UNH', 'MRK', 'HD', 'MC
D', 'PFE', 'TRV', 'HSBC']
                                    Stock transaction: 19 - Sell
                                    Stock transaction: 19 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 12.1 USD
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                                    Stock transaction: 19 - Check step
                  3 - Scenario 20 : 2024-10-29 16:30:00 to 2024-10-29 18:30:00 -
['ABBV', 'KO', 'ROG', 'HON', 'BA', 'GS', 'META', 'UNH', 'HD', 'DOW', 'WMT', 'BTI',
'DD', 'PFE', 'GSK']
                                    Stock transaction: 20 - Sell
                                    Stock transaction: 20 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 2.05 USD
                                    Stock transaction: 20 - Check step
                  3 - Scenario 21 : 2024-10-29 18:30:00 to 2024-10-30 14:30:00 -
['PM', 'CAT', 'UNH', 'CRM', 'META', 'GS', 'TSM', 'MCD', 'V', 'IBM', 'ROG', 'MA', 'MS
FT', 'HON', 'NVDA']
                                    Stock transaction: 21 - Sell
                                    Stock transaction: 21 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 11.5 USD
                                    Stock transaction: 21 - Check step
                  3 - Scenario 22 : 2024-10-30 14:30:00 to 2024-10-30 16:30:00 -
['JPM', 'MSFT', 'IBM', 'V', 'TRV', 'GS', 'UNH', 'MCD', 'MA', 'CAT', 'CRM', 'NVS', 'A
XP', 'ALV', 'C']
                                    Stock transaction: 22 - Sell
                                    Stock transaction: 22 - Buy
                                                          New investment : $ 9990
00.0 USD
                                                          Remainder of the invest
ment : $ 2.13 USD
                                    Stock transaction: 22 - Check step
                  3 - Scenario 23 : 2024-10-30 16:30:00 to 2024-10-30 18:30:00 -
['ENR', 'PM', 'TSM', 'RY', 'MA', 'MRK', 'ABBV', 'MSFT', 'NVDA', 'AMGN', 'GS', 'HON',
'TM', 'META', 'GE']
                                    Stock transaction: 23 - Sell
                                    Stock transaction: 23 - Buy
                                                          New investment : $ 9990
00.0 USD
                                                          Remainder of the invest
ment : $ 2.73 USD
                                    Stock transaction: 23 - Check step
                  3 - Scenario 24 : 2024-10-30 18:30:00 to 2024-10-31 14:30:00 -
['HON', 'TRV', 'IBM', 'AMGN', 'ABBV', 'MRK', 'UNH', 'META', 'ROG', 'CAT', 'HD', 'M
A', 'MSFT', 'V', 'GOOG']
                                    Stock transaction: 24 - Sell
                                    Stock transaction: 24 - Buy
                                                          New investment : $ 1000
000.0 USD
                                                          Remainder of the invest
ment : $ 5.78 USD
                                    Stock transaction: 24 - Check step
                  3 - Scenario 25 : 2024-10-31 14:30:00 to 2024-10-31 16:30:00 -
['TRV', 'PG', 'V', 'ABBV', 'NKE', 'AMGN', 'UNH', 'MCD', 'META', 'MA', 'GS', 'CRM',
'GOOG', 'GOOGL', 'HON']
                                    Stock transaction: 25 - Sell
                                    Stock transaction: 25 - Buy
```

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                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 39.6 USD
                                        Stock transaction: 25 - Check step
                                        Stock transaction: 25 - Final Sell
                                                               Processing time cost: 6.
68 minutes
                                        Stock transaction: 25 - Printing results for th
is scenario
                                         *** RESULTS STORED***

         2 - Price : close - 25 scenarios
                    3 - Scenario 1 : 2024-10-21 14:30:00 to 2024-10-21 16:30:00 - ['E
NR', 'BHP', 'CVX', 'GE', 'AAPL', 'MCD', 'UNH', 'MA', 'NVDA', 'META', 'AMGN', 'MMM',
'AMZN', 'GS', 'HON']
                                        Stock transaction: 1 - Fist Buy
                                                               Initial investment : $ 1
000000.0 USD
                                                               Remainder of the investm
ent : $ 38.0 USD
                                        Stock transaction: 1 - Check step
                    3 - Scenario 2 : 2024-10-21 16:30:00 to 2024-10-21 18:30:00 - ['P
G', 'AMGN', 'MSFT', 'TSM', 'ROG', 'UNH', 'BA', 'AXP', 'XOM', 'HD', 'CVX', 'TRV', 'PE
P', 'HON', 'JPM']
                                        Stock transaction: 2 - Sell
                                        Stock transaction: 2 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 57.5 USD
                                        Stock transaction: 2 - Check step
                    3 - Scenario 3 : 2024-10-21 18:30:00 to 2024-10-22 14:30:00 - ['T
M', 'ENR', 'MRK', 'GS', 'PEP', 'HD', 'ALV', 'META', 'AMZN', 'NKE', 'BA', 'NVDA', 'UN
H', 'GOOGL', 'V']
                                        Stock transaction: 3 - Sell
                                        Stock transaction: 3 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 8.54 USD
                                        Stock transaction: 3 - Check step
                    3 - Scenario 4 : 2024-10-22 14:30:00 to 2024-10-22 16:30:00 - ['N
VDA', 'HD', 'ALV', 'META', 'MA', 'UNH', 'BA', 'MCD', 'AXP', 'PM', 'MSFT', 'CRM', 'GO
OG', 'TSM', 'JPM']
                                        Stock transaction: 4 - Sell
                                        Stock transaction: 4 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 73.6 USD
                                        Stock transaction: 4 - Check step
                    3 - Scenario 5 : 2024-10-22 16:30:00 to 2024-10-22 18:30:00 - ['T
RV', 'PM', 'VZ', 'GS', 'CVX', 'HD', 'GE', 'MSFT', 'MCD', 'CRM', 'AXP', 'ALV', 'JNJ',
'MMM', 'AMZN']
                                        Stock transaction: 5 - Sell
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                                    Stock transaction: 5 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 11.1 USD
                                    Stock transaction: 5 - Check step
                  3 - Scenario 6 : 2024-10-22 18:30:00 to 2024-10-23 14:30:00 - ['M
A', 'META', 'GS', 'AMGN', 'PM', 'UNH', 'GE', 'GOOG', 'TRV', 'CRM', 'MMM', 'CAT', 'JP
M', 'TSM', 'HON']
                                    Stock transaction: 6 - Sell
                                    Stock transaction: 6 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 25.9 USD
                                    Stock transaction: 6 - Check step
                  3 - Scenario 7 : 2024-10-23 14:30:00 to 2024-10-23 16:30:00 -
['V', 'ABBV', 'GE', 'UNH', 'TSM', 'TRV', 'MA', 'MMM', 'MCD', 'JNJ', 'VZ', 'ENR', 'ME
TA', 'NVS', 'HSBC']
                                    Stock transaction: 7 - Sell
                                    Stock transaction: 7 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 2.48 USD
                                    Stock transaction: 7 - Check step
                  3 - Scenario 8 : 2024-10-23 16:30:00 to 2024-10-23 18:30:00 - ['P
EP', 'ABBV', 'RY', 'TSM', 'BA', 'JNJ', 'AAPL', 'PG', 'META', 'NVDA', 'MA', 'HD', 'G
S', 'CAT', 'AMZN']
                                    Stock transaction: 8 - Sell
                                    Stock transaction: 8 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 123.0 USD
                                    Stock transaction: 8 - Check step
                  3 - Scenario 9 : 2024-10-23 18:30:00 to 2024-10-24 14:30:00 - ['M
ETA', 'UNH', 'HON', 'GS', 'IBM', 'CRM', 'MSFT', 'HD', 'ORCL', 'ABBV', 'BA', 'JNJ',
'AMGN', 'AMZN', 'V']
                                    Stock transaction: 9 - Sell
                                    Stock transaction: 9 - Buy
                                                        New investment : $ 1010
000.0 USD
                                                        Remainder of the invest
ment : $ 9.31 USD
                                    Stock transaction: 9 - Check step
                  3 - Scenario 10 : 2024-10-24 14:30:00 to 2024-10-24 16:30:00 -
['PM', 'PG', 'MCD', 'MMM', 'UNH', 'GS', 'CRM', 'META', 'JNJ', 'NVS', 'TM', 'BHP', 'H
D', 'MRK', 'ROG']
                                    Stock transaction: 10 - Sell
                                    Stock transaction: 10 - Buy
                                                        New investment : $ 1000
000.0 USD
                                                        Remainder of the invest
ment : $ 16.9 USD
                                    Stock transaction: 10 - Check step
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                    3 - Scenario 11 : 2024-10-24 16:30:00 to 2024-10-24 18:30:00 -
['MRK', 'BA', 'AMGN', 'ABBV', 'HON', 'UNH', 'HD', 'AAPL', 'IBM', 'ROG', 'AXP', 'MC
D', 'TSM', 'NVS', 'GS']
                                        Stock transaction: 11 - Sell
                                        Stock transaction: 11 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 47.3 USD
                                        Stock transaction: 11 - Check step
                    3 - Scenario 12 : 2024-10-24 18:30:00 to 2024-10-25 14:30:00 -
['TRV', 'MA', 'META', 'GS', 'IBM', 'SAN', 'DOW', 'MCD', 'C', 'ENR', 'PFE', 'BP', 'AL
V', 'GSK', 'HD']
                                        Stock transaction: 12 - Sell
                                        Stock transaction: 12 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 0.264 USD
                                        Stock transaction: 12 - Check step
                    3 - Scenario 13 : 2024-10-25 14:30:00 to 2024-10-25 16:30:00 -
['NVDA', 'MMM', 'TSM', 'INTC', 'IBM', 'PG', 'MCD', 'MSFT', 'UNH', 'PEP', 'ROG', 'CV
X', 'AAPL', 'META', 'BA']
                                        Stock transaction: 13 - Sell
                                        Stock transaction: 13 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 13.1 USD
                                        Stock transaction: 13 - Check step
                    3 - Scenario 14 : 2024-10-25 16:30:00 to 2024-10-25 18:30:00 -
['PG', 'SHEL', 'BP', 'ROG', 'MRK', 'CRM', 'AMGN', 'IBM', 'XOM', 'GS', 'NVDA', 'AXP',
'ABBV', 'CAT', 'HD']
                                        Stock transaction: 14 - Sell
                                        Stock transaction: 14 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 27.5 USD
                                        Stock transaction: 14 - Check step
                    3 - Scenario 15 : 2024-10-25 18:30:00 to 2024-10-28 14:30:00 -
['IBM', 'ROG', 'ABBV', 'XOM', 'TSM', 'AMGN', 'MA', 'GS', 'TRV', 'UNH', 'META', 'NVD
A', 'HON', 'AMZN', 'DD']
                                        Stock transaction: 15 - Sell
                                        Stock transaction: 15 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 32.6 USD
                                        Stock transaction: 15 - Check step
                    3 - Scenario 16 : 2024-10-28 14:30:00 to 2024-10-28 16:30:00 -
['ROG', 'GE', 'AMGN', 'GOOG', 'META', 'CRM', 'TRV', 'TSM', 'MMM', 'MSFT', 'UNH', 'G
S', 'BA', 'AMZN', 'V']
                                        Stock transaction: 16 - Sell
                                        Stock transaction: 16 - Buy
                                                                New investment : $ 9980
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00.0 USD
                                                                Remainder of the invest
ment : $ 75.7 USD
                                        Stock transaction: 16 - Check step
                    3 - Scenario 17 : 2024-10-28 16:30:00 to 2024-10-28 18:30:00 -
['ROG', 'HD', 'HON', 'PM', 'XOM', 'BA', 'MSFT', 'META', 'MCD', 'GS', 'AXP', 'NVDA',
'AMGN', 'TSM', 'RY']
                                        Stock transaction: 17 - Sell
                                        Stock transaction: 17 - Buy
                                                                New investment : $ 1000
000.0 USD
                                                                Remainder of the invest
ment : $ 111.0 USD
                                        Stock transaction: 17 - Check step
                    3 - Scenario 18 : 2024-10-28 18:30:00 to 2024-10-29 14:30:00 -
['PM', 'HD', 'JPM', 'MA', 'META', 'AMGN', 'GS', 'NVDA', 'TRV', 'CAT', 'ROG', 'AXP',
'NVS', 'GE', 'HON']
                                        Stock transaction: 18 - Sell
                                        Stock transaction: 18 - Buy
                                                                New investment : $ 9990
00.0 USD
                                                                Remainder of the invest
ment : $ 1.36 USD
                                        Stock transaction: 18 - Check step
                    3 - Scenario 19 : 2024-10-29 14:30:00 to 2024-10-29 16:30:00 -
['MSFT', 'MRK', 'AMGN', 'CRM', 'GS', 'IBM', 'META', 'BA', 'AAPL', 'NVS', 'HD', 'UN
H', 'CVX', 'TM', 'HON']
                                        Stock transaction: 19 - Sell
                                        Stock transaction: 19 - Buy
                                                                New investment : $ 9970
00.0 USD
                                                                Remainder of the invest
ment : $ 4.73 USD
                                        Stock transaction: 19 - Check step
                    3 - Scenario 20 : 2024-10-29 16:30:00 to 2024-10-29 18:30:00 -
['BTI', 'WMT', 'DD', 'DOW', 'ABBV', 'HON', 'ROG', 'META', 'BA', 'GS', 'HD', 'UNH',
'IBM', 'MCD', 'MSFT']
                                        Stock transaction: 20 - Sell
                                        Stock transaction: 20 - Buy
                                                                New investment : $ 9970
00.0 USD
                                                                Remainder of the invest
ment : $ 16.7 USD
                                        Stock transaction: 20 - Check step
                    3 - Scenario 21 : 2024-10-29 18:30:00 to 2024-10-30 14:30:00 -
['CAT', 'UNH', 'GS', 'MCD', 'AAPL', 'PM', 'AMGN', 'META', 'MA', 'TSM', 'BA', 'V', 'H
D', 'AMZN', 'GOOG']
                                        Stock transaction: 21 - Sell
                                        Stock transaction: 21 - Buy
                                                                New investment : $ 9980
00.0 USD
                                                                Remainder of the invest
ment : $ 94.7 USD
                                        Stock transaction: 21 - Check step
                    3 - Scenario 22 : 2024-10-30 14:30:00 to 2024-10-30 16:30:00 -
['JPM', 'CRM', 'IBM', 'ORCL', 'AXP', 'MSFT', 'UNH', 'GE', 'ABBV', 'GOOGL', 'MA',
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'V', 'TRV', 'CAT', 'MCD']
                                    Stock transaction: 22 - Sell
                                    Stock transaction: 22 - Buy
                                                        New investment : $ 9960
00.0 USD
                                                        Remainder of the invest
ment : $ 90.5 USD
                                    Stock transaction: 22 - Check step
                  3 - Scenario 23 : 2024-10-30 16:30:00 to 2024-10-30 18:30:00 -
['ENR', 'PM', 'TSM', 'MA', 'AMGN', 'ABBV', 'MSFT', 'META', 'GE', 'MRK', 'HON', 'UN
H', 'TRV', 'ORCL', 'AXP']
                                    Stock transaction: 23 - Sell
                                    Stock transaction: 23 - Buy
                                                        New investment : $ 9960
00.0 USD
                                                        Remainder of the invest
ment : $ 13.5 USD
                                    Stock transaction: 23 - Check step
                  3 - Scenario 24 : 2024-10-30 18:30:00 to 2024-10-31 14:30:00 -
['HON', 'IBM', 'V', 'ABBV', 'TRV', 'UNH', 'MA', 'AMGN', 'MSFT', 'META', 'GOOG', 'GOO
GL', 'CRM', 'CAT', 'BA']
                                    Stock transaction: 24 - Sell
                                    Stock transaction: 24 - Buy
                                                        New investment : $ 9970
00.0 USD
                                                        Remainder of the invest
ment : $ 106.0 USD
                                    Stock transaction: 24 - Check step
                  3 - Scenario 25 : 2024-10-31 14:30:00 to 2024-10-31 16:30:00 -
['TRV', 'MA', 'META', 'AMGN', 'UNH', 'GS', 'BA', 'CRM', 'AXP', 'CAT', 'ROG', 'MSFT',
'TSM', 'JPM', 'ORCL']
                                    Stock transaction: 25 - Sell
                                    Stock transaction: 25 - Buy
                                                        New investment : $ 9980
00.0 USD
                                                        Remainder of the invest
ment : $ 87.0 USD
                                    Stock transaction: 25 - Check step
                                    Stock transaction: 25 - Final Sell
                                                       Processing time cost: 6.
64 minutes
                                    Stock transaction: 25 - Printing results for th
is scenario
                                     *** RESULTS STORED***

        End of transactions for variable scenario
End of transactions for close price
End of running test number 23
End
```

In [ ]:
```
# Generate a summary file to analize the results

# Custom names mapping
category_names = {'$ Net gain (+) / loss (-) (static-open)': 'Static with open pric
                  '$ Net gain (+) / loss (-) (static-close)': 'Static with close pr
                  '$ Net gain (+) / loss (-) (variable-open)': 'Variable with open
```

```
                    '$ Net gain (+) / loss (-) (variable-close)': 'Variable with clos
                    }

# Find the column with the maximum value and map to custom name
test_summary['Best scenario'] = test_summary[['$ Net gain (+) / loss (-) (static-op

# Display the updated DataFrame
test_summary

# Extract the results
file_name='Test summary for file ' + test_filename + '.xlsx'
test_summary.to_excel(local_location + file_name)
```

In [ ]:

In [ ]:

In [ ]: