

Assignment 2

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Submission Instructions

Upload your code file to the Assignment 1 dropbox. It must run from start to finish without error.

Note:

You are encouraged to work with others and you can discuss your solutions. However, DO NOT SHARE COPIES of YOUR WORK ELECTRONICALLY OR IN ANY OTHER FORM. Keep good karma with your career network and protect your reputation – do not plagiarize.

Introduction:

This application allows users to examine daily and cumulative changes to closing price and volume for stocks in the stock market. The application prompts the user to either examine a stock or terminate the application.

If a user chooses to examine a stock they are prompted to enter a stock symbols and total days back for the analysis. The results of the analysis are printed and the cycle is repeated until the user chooses to exit the application.

Rubric:

(10/10 marks) The loop is set up so the user can run the program successfully from the start to completion without termination as many times as the user wants. The application terminates properly when the user wants.

(10/10 marks) All day and stock inputs are read from the user and handled correctly and dynamically.

(10/10 marks) Menus and output appears exactly as shown.

(20/20 marks) All statistics in one summary data frame are generated correctly for both stocks exactly as shown in the sample output.

$$\begin{aligned} \text{The formula for daily percent change} &= \frac{\text{Current day close price} - \text{Previous day close price}}{\text{Previous day close price}} \\ &= \left(\frac{224.339996 - 216.440002}{216.440002} \right) = 0.0365 \end{aligned}$$

$$\text{The formula for the overall percentage change} = \frac{\text{Period end close price} - \text{Period start close price}}{\text{Period start close price}}$$

$$= \left(\frac{224.339996 - 212.649994}{212.649994} \right) = 0.055$$

Daily Percent Changes - 2021-02-18 to 2021-02-22 * ZAZ *

Date	Close	Volume	Volume % Change	Close % Change
2021-02-18	212.649994	31691500	0.0000	0.0000
2021-02-19	216.440002	30480900	-0.0382	0.0178
2021-02-22	224.339996	37777260	0.2394	0.0365

Summary of Cumulative Changes for msft

2021-01-15 to 2021-01-20

% Volume Change: 0.192

% Close Price Change: 0.055

Error handling is not required.

Code Hints

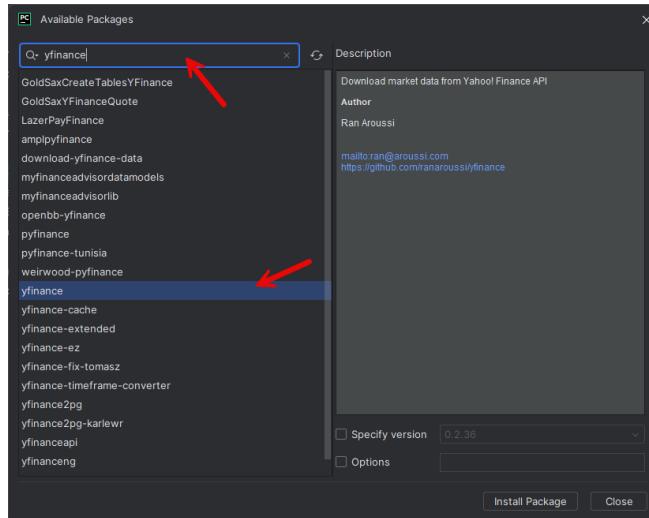
Example 1: Reading In Content from a User

The `input()` function can be used to prompt a user for input.

```
print("Input some text: ")
answer = input()
print("The text you entered is: " + answer)
```

Example 2: Dynamically Set Dates and Retrieve Stocks in a DataFrame from Yahoo Finance

This code retrieves data for the last five days for “Apple” stock. First, you will need to install `yfinance`.



Notice also how dates are set from the current date back by 5 days. Extra code at the end shows how to extract the close price from the last day. This code retrieves Apple stock data and stores it in a data frame.

```
import datetime
import yfinance as yf

def getStock(stkInput, dayInput):
    dt = datetime.date.today()
    dtPast = dt + datetime.timedelta(days=-dayInput)

    # Call Yahoo finance to get stock data for the stock provided.
    dfStock = yf.download(stkInput, start=dtPast, end=dt)
    return dfStock

def removeTime(df):
    newList=[]
    dateList = list(df.index.values)
    print(dateList)
    for i in range(0, len(dateList)):
        dateStr=str(dateList[i])
        itemList=dateStr.split("T")
        print(itemList)
        newList.append(itemList[0])
    df["Date"] = newList
    print(df)
    df.set_index("Date", inplace=True)

df = getStock("AAPL",5)

print("Original Data\n", df)

removeTime(df)
print("Cleaned Data\n", df)
```

Example 3: Assigning Data to a Data Frame Cell

A manageable way to generate the data frame in the format needed is to modify the existing data frame that is returned by the pandas data reader. This example shows many techniques that will help you to create new columns, assign data to cells of the data frame, and remove columns from a data frame.

```
import pandas as pd

# Define empty data frame structure.
df = pd.DataFrame(columns=['City', 'Temperature'])
```

```

# Add rows of data.
df = df.append({'City':'Mumbai', 'Temperature':23.0}, ignore_index=True)
df = df.append({'City':'Beijing', 'Temperature':-11.0}, ignore_index=True)

# Create a new column with zero float values in all rows.
df['Fahrenheit'] = 0.0

# Show original data frame.
print("Data frame with original data in Celsius:")
print(df)

FAHRENHEIT_IDX = 2
for i in range(0, len(df)):
    celsius = df.iloc[i]['Temperature']

    # Store float values in cell.
    df.iat[i, FAHRENHEIT_IDX] = celsius*9.0/5.0 + 32

print("\nDataframe after changed to Fahrenheit: ")
print(df)

# Remove the 'Temperature' column.
newColumnList = ['City', 'Fahrenheit']
df = df[newColumnList]
print("\nDataframe after 'Temperature' column is removed: ")
print(df)

```

The output is:

Data frame with original data in Celsius:			
	City	Temperature	Fahrenheit
0	Mumbai	23.0	0.0
1	Beijing	-11.0	0.0
 Dataframe after changed to Fahrenheit:			
	City	Temperature	Fahrenheit
0	Mumbai	23.0	73.4
1	Beijing	-11.0	12.2
 Dataframe after 'Temperature' column is removed:			
	City	Fahrenheit	
0	Mumbai	73.4	
1	Beijing	12.2	

Example 4: Rounding Numbers and Converting to Upper-Case

Here is a quick example that shows how to manipulate strings and numbers to convert to upper case and to round floating point values.

```

symbol = "msft"
print("Stock converted to upper case: " + symbol.upper() )

```

Comp2853

```
floatingPointVal = 3.1472343
roundedValue = round(floatingPointVal, 3)
print("Rounded value = " + str(roundedValue))
```

Here is the output:

```
Stock converted to upper case: MSFT
Rounded value = 3.147
```

Sample Output

Your output should look like this exactly with the exception of the stock choices and total number of days for the analysis which must be entered by the user and handled dynamically at run-time.

```
-----
Stock Report Menu Options
-----
1. Report changes for a stock
2. Quit
1
Please enter the stock symbol:
msft
Please enter the number of days for the analysis:
6
*****
Daily Percent Changes - 2021-01-15 to 2021-01-20 * MSFT *
*****
          Close      Volume  Volume % Change  Close % Change
Date
2021-01-15  212.649994  31691500           0.0000    0.0000
2021-01-19  216.440002  30480900         -0.0382    0.0178
2021-01-20  224.339996  37777260         0.2394    0.0365
-----
Summary of Cumulative Changes for msft
-----
2021-01-15 to 2021-01-20
% Volume Change:      0.192
% Close Price Change: 0.055
-----
Stock Report Menu Options
-----
1. Report changes for a stock
2. Quit
1
Please enter the stock symbol:
aapl
Please enter the number of days for the analysis:
2
```

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```
*****
Daily Percent Changes - 2021-01-19 to 2021-01-20 * AAPL *
*****
      Close     Volume  Volume % Change  Close % Change
Date
2021-01-19  127.830002  90757300          0.0000      0.0000
2021-01-20  132.029999  98769961          0.0883      0.0329
-----
Summary of Cumulative Changes for aapl
-----
2021-01-19 to 2021-01-20
% Volume Change:      0.088
% Close Price Change: 0.033
-----
Stock Report Menu Options
-----
1. Report changes for a stock
2. Quit
1

Please enter the stock symbol:
msft
Please enter the number of days for the analysis:
1
*****
Daily Percent Changes - 2021-01-20 to 2021-01-20 * MSFT *
*****
      Close     Volume  Volume % Change  Close % Change
Date
2021-01-20  224.339996  37777260          0.0         0.0
-----
Summary of Cumulative Changes for msft
-----
2021-01-20 to 2021-01-20
% Volume Change:      0.0
% Close Price Change: 0.0
-----
Stock Report Menu Options
-----
1. Report changes for a stock
2. Quit
1

Please enter the stock symbol:
msft
Please enter the number of days for the analysis:
3
*****
```

Comp2853

```
Daily Percent Changes - 2021-01-18 to 2021-01-20 * MSFT *
*****
          Close      Volume  Volume % Change  Close % Change
Date
2021-01-19  216.440002  30480900           0.0000      0.0000
2021-01-20  224.339996  37777260           0.2394      0.0365
-----
Summary of Cumulative Changes for msft
-----
2021-01-18 to 2021-01-20
% Volume Change:      0.239
% Close Price Change: 0.036
-----
Stock Report Menu Options
-----
1. Report changes for a stock
2. Quit
```