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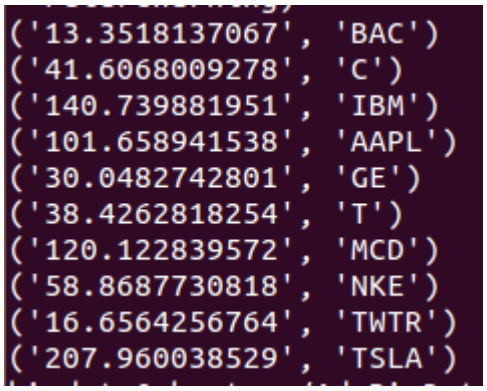
Homework 2

The results I received for the stock prediction are as follows:



In order to get the prediction for the 10 companies provided, I first gathered the prediction data. I did this using Yahoo! Finance. I retrieved the Yahoo! data between two specified dates – today's date and a previous date (in this case, February 1st, 2016). I also retrieved the data specified from Yahoo! Finance for today. The values I grabbed are the price when the stock market opens, the highest price for the day in the stock market, the lowest price, the current price, the volume of shares in a day, and the current price converted to a float. I additionally grabbed the closing price. These values are necessary for prediction. I predicted the price using the moving average of the last 14 days and the exponential moving average. The exponential moving average gives importance to the stocks closer to today. I also used the golden ratio, which is a Fibonacci ratio that is used in predictions to compare your previous price to your current price. Then, I outputted my results to the terminal. In order to improve my results, I could have potentially used a linear regression or Gaussian process.

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##
# Collaborated with Palash Matey, Rikin Mathur, Maanit Mehra,
# Ashish Nanda, Zoltan Onodi-Szucs and Marshall Van Loon
##
import sys
import datetime as date
import datetime as dt
from sklearn import gaussian_process
import pandas as pd
import pandas.io.data as pddata
from pandas import Series
import numpy as np
from yahoo_finance import Share
import yahoo_finance as yahoo
import itertools

# Initialize Arrays
array_1 = []
array_2 = []
curdata = []
average=[]
percentage=[]
diff=0
sum=0

# Set the list of Firm Stocks
firmlist = ['BAC','C','IBM','AAPL','GE','T','MCD','NKE','TWTR','TSLA']

# Gather the Prediction Data
def gatherpreddata(companyname, today):
    # Gather the Yahoo Prediction Data, where the start date is a specified date to start aquiring
data and the end date is today's date
    yahoo_data = pddata.get_data_yahoo(companyname,start= dt.datetime(2016, 2, 1),end = dt.datetime
(today.year, today.month, today.day))
    # Gather the data for today - stock when the market opens, the highest stock during the day, et
c.
    yahoo_data.loc[today] = (Share(companyname).get_open(), Share(companyname).get_days_high(), Sha
re(companyname).get_days_low(),Share(companyname).get_price(),Share(companyname).get_volume(), floa
t(Share(companyname).get_price()))
    # Closing Data
    price = yahoo_data['Adj Close']
    # Moving average of the last 14 days
    moving_average = pd.rolling_mean(price, 14)
    # The exponential moving average gives importance to the stocks closer to today
    exp_moving_avg = pd.ewma(price, span=5)
    # Golden Ratio
    fibonacci_ratio = ((1-5**0.5)/2)
    # Take the last two of the moving average and the last two of exponential moving average and mu
ltiply them by the Fibonacci Golden Ratio
    predict_price = (((moving_average[-1]-moving_average[-2])*(1-fibonacci_ratio)+(exp_moving_avg[-
1]-exp_moving_avg[-2])*(fibonacci_ratio)+price[-1]))
```

```
    # Store these values into an array
    array_1.append(str(predict_price))
    return array_1

def main():
        output = []
        # Determine Today's Date
        today = dt.date.today()-dt.timedelta(days=0)
        # Gather the Prediction Data
        for companyname in firmlist:
                gatherpreddata(companyname, today)
        # Put the output data for the Stocks
        output = gatherpreddata(companyname, today)
        for x,n in zip(output,firmlist):
                print (x,n)
main()
```