1.) Pull in Data and Convert ot Monthly

```
In [24]: import yfinance as yf
         import pandas as pd
         import numpy as np
         import matplotlib.pyplot as plt
```

```
In [30]: apple_data = yf.download('AAPL')
         df = apple_data.resample("M").last()[["Adj Close"]]
         df.head()
```

```
[*********************100%%**********************]  1 of 1 completed
```

Out[30]:
	Adj Close
Date	
1980-12-31	0.117887
1981-01-31	0.097592
1981-02-28	0.091546
1981-03-31	0.084637
1981-04-30	0.098023

2.) Create columns.

- Current Stock Price, Difference in stock price, Whether it went up or down over the next month, option premium

```
In [31]: # difference in stock price
         df['Diff'] = df['Adj Close'].diff().shift(-1)

         # Target
         df['Target'] = np.sign(df['Diff'])
         df['Premium'] = .08*df['Adj Close']
```

3.) Pull in X data, normalize and build a LogReg on column 2

```
In [27]: import numpy as np
         import pandas as pd
         from sklearn.model_selection import train_test_split
         from sklearn.linear_model import LogisticRegression
         from sklearn import metrics
```

```
In [28]: X = pd.read_csv("Xdata.csv", index_col="Date", parse_dates=["Date"])
```

```
In [32]: y = df.loc[:"2023-09-30","Target"].copy()

         df = df.loc[:"2023-09-30"].copy()
```

```
In [33]: # fit a logistic regression model
         logreg = LogisticRegression()

         logreg.fit(X, y)
```

Out[33]: ▾ LogisticRegression
         LogisticRegression()

4.) Add columns, prediction and profits.

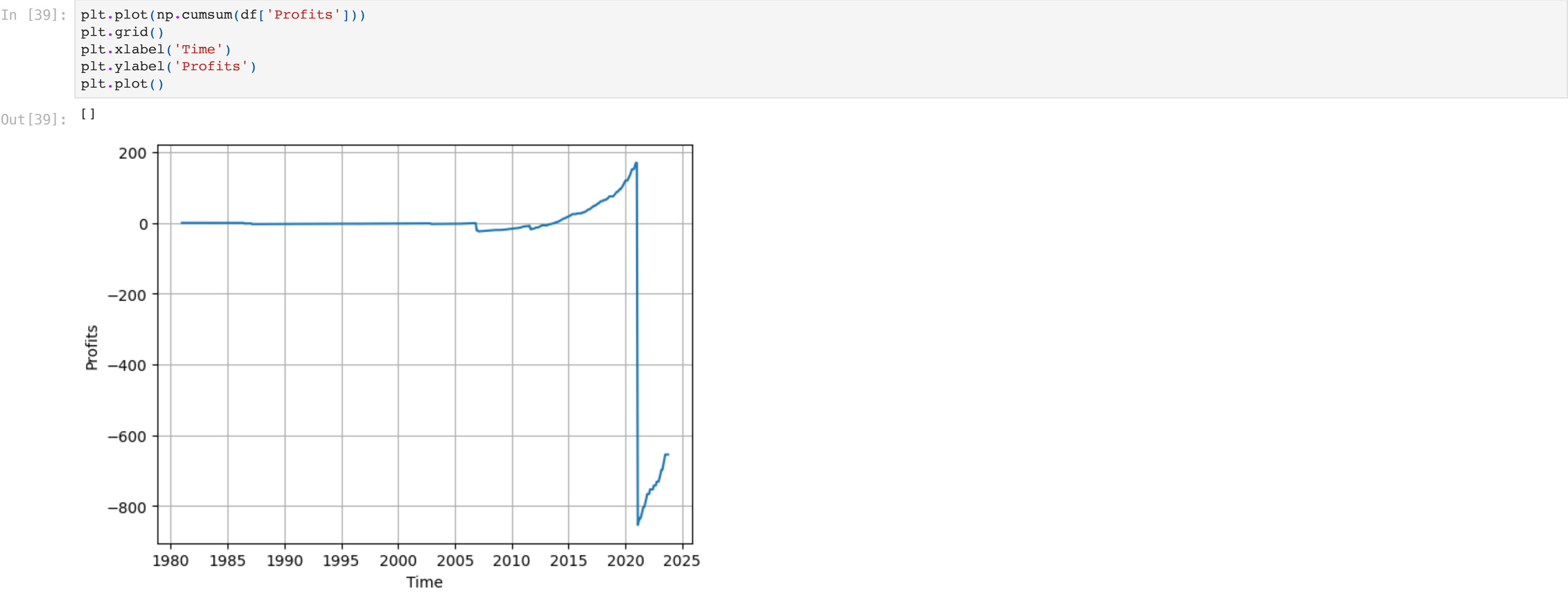```
In [35]: y_pred = logreg.predict(X)
```

```
In [36]: df['Predictions']= y_pred
```

```
In [37]: df['Profits'] = 0.
```

```
In [38]: # True Positive
         df.loc[(df['Target']==1) & (df['Predictions']==1),'Profits' ] = df['Premium']

         # False Positive
         df.loc[(df['Target']==-1) & (df['Predictions']==1),'Profits' ] = (100*df['Diff'])+df['Premium']
```

5.) Plot profits over time

```
In [39]: plt.plot(np.cumsum(df['Profits']))
         plt.grid()
         plt.xlabel('Time')
         plt.ylabel('Profits')
         plt.plot()
```

Out[39]: []

5.5) short write up about how you see your skills valuable to PJ and/or Philip Liu.

Data Analysis and Econometrics:

1. Conduct time-series analysis to forecast cryptocurrency prices and volatility.
2. Use panel data to study the behavior of users across different blockchain platforms.
3. Apply machine learning algorithms for predictive modeling and trading strategy development.

6.) Create a loop that stores total profits over time

```
In [ ]:
```

7.) What is the optimal threshold and plot the total profits for this model.

```
In [ ]:
```