ECON441B-Intro to ML Lab

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1.) Pull in Data and Convert ot Monthly

In [19]:
```
import yfinance as yf
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

In [20]:
```
apple_data = yf.download('AAPL')
df = apple_data.resample("M").last()[["Adj Close"]]
```

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

2.) Create columns.

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

In [21]:
```
df.head()
```

Out[21]:

Date	Adj Close
1980-12-31	0.117887
1981-01-31	0.097591
1981-02-28	0.091546
1981-03-31	0.084637
1981-04-30	0.098023

In [22]:
```
# 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 [23]:
```
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 [24]:
```
X = pd.read_csv("Xdata.csv", index_col="Date", parse_dates=["Date"])
```

In [25]:
```
y = df.loc[:"2023-09-30","Target"].copy()

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

In [26]:
```
# fit a log reg
logreg = LogisticRegression()

logreg.fit(X,y)
```

Out[26]:
```
▾ LogisticRegression
LogisticRegression()
```

In [ ]:
```

```

4.) Add columns, prediction and profits.

In [27]:
```
y_pred = logreg.predict(X)
```

In [28]:
```
df["Predictions"]=y_pred
```

In [29]:
```
df["Profits"]= 0.
```

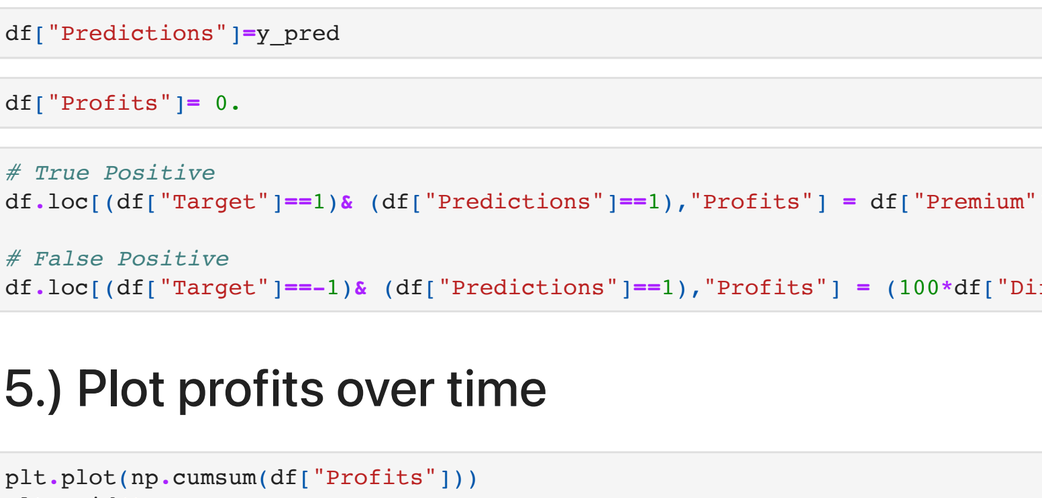
In [33]:
```
# True Positive
df.loc[(df["Target"]==1)& (df["Predictions"]==1),"Profits"] = df["Premium"]

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

5.) Plot profits over time

In [35]:
```
plt.plot(np.cumsum(df["Profits"]))
plt.grid()
plt.xlabel("Time")
plt.ylabel("Profits")
plt.plot()
```

Out[35]:
```
[]
```



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

Philip Liu introduces a Coprate business model which could be supported by the DGX Cloud. And he states how to position and pitch DGX Cloud. As it's a full-stack development platform for generative AI, I regard Logistic Regression as one of the most important and core algorithms in machine learning.