Homework #3
FIM 590, Spring '22
Due: April 21

Professor Papanicolaou

Problem #1 (Implementing Lookback)

Based on the Python scripts on the FIM590 Moodle page, implement the VIX multinomial trading signal with a dense neural network and a lookback window of 2, 5, 8 and 10 days. Which length of window works best? Use the following block of code to put your labelled data into lookback form:

```
def create_dataset(dataset, look_back=1):
    dataX, dataY = [], []
    for i in range(len(dataset)-look_back):
        a = dataset[i:(i+look_back),0, 0:2]
        dataX.append(a)
        dataY.append(dataset[i + look_back,0, 2])
    return np.array(dataX), np.array(dataY)
```

Problem #2 (Cross Validation of Lookback)

Perform a K-fold cross validation for the best lookback window from part #1. Based these cross validations, does the lookback provide improved performance in comparison to the trading signal without lookbacl?