# Trading Strategy Dash

## Strategy

This app explores a simple strategy that works as follows:

1. While the market is closed, retrieve the past N days' worth of data for:
   - IVV: daily open, close, yield(calculated)
   - US Treasury bond yield for 5,10 and 30 years.
   - Price change of oil(EIA).
2. Fit different machine learning models using features listed below to predict whether the IVV would have yield greater than 0 next day:
   - the output (y): the yield of IVV next day would be greater than 0(1 for True and 0 for false)
   - the input (x): the yield of IVV on previous N days, IVV' moving average, yield of bonds, yield of EIA
   - the models: KNN, Dicision Tree, Loglinear Classifier
3. After the model is being trained, we use the model to predict each day's IVV yield,we use the model result of last 30 days to do a back-test.
4. If the predicted output is 1, which means the IVV would have postive return next day. We submit one trade:
   - A market order to BUY 100 shares of IVV, which fills at open price the next trading day.
5. If the predicted output is 0, which means the IVV would have negative return next day. We submit one trade:
   - A limit order to SELL all shares of IVV, which fills at the close price of the last trading day.

## Data Note & Disclaimer

This Dash app makes use of yahoo finance data to fit the model using pandas_datareader package to read yahoo finance's stock and bond data.The original data contains close, open, low, high price and we can use them to calculate the yield.These are all the work we done in fetching data and preprocessing it.

## Parameters

1. N: number of days of the moving average of IVV yield, which would be added as a feature into the model
2. model: Which specific machine learning model would be used in training dataset.

## Window Size (Moving average of x days.)

7 10 13 16 19 22 25 28 31 34 37 40 43 46 49 52 55 58 61 64 67 70 73 76 79 82 85 88 91 94 97100

## Model Selection

◉ Decision Tree ○ Loglinear ○ KNN

Submit

Successfully trained model with window size 30

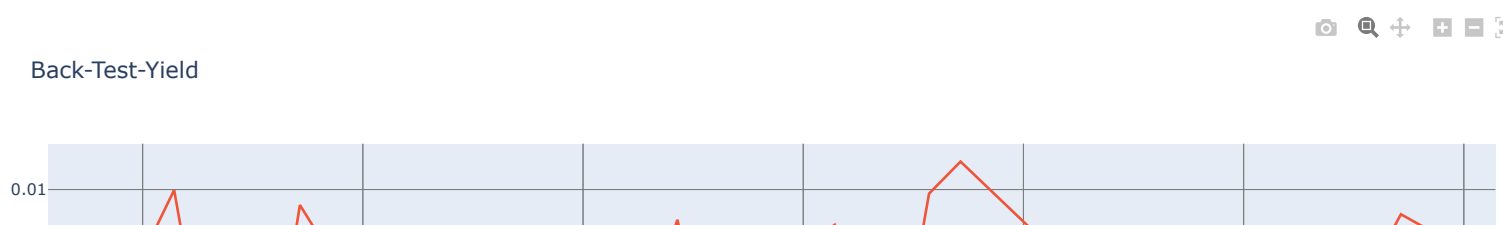
## Trade Ledger

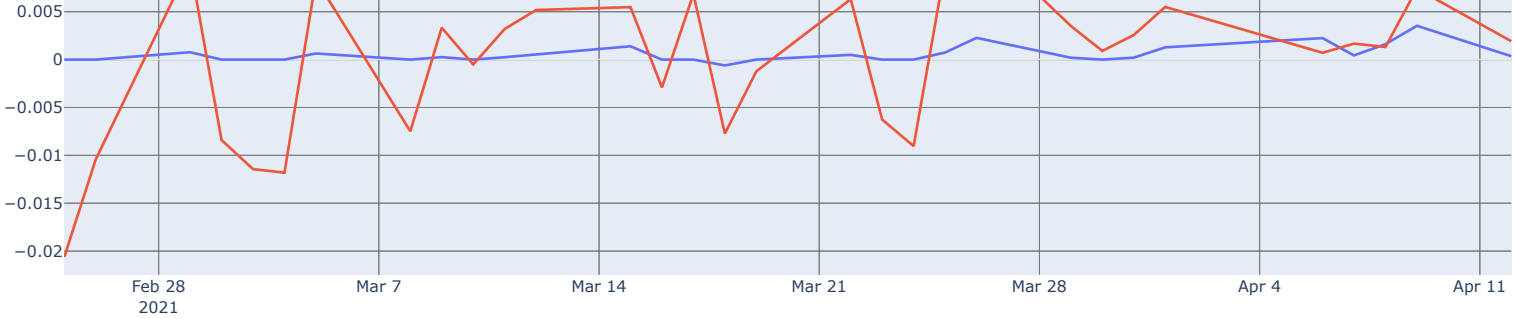
| Date | position | Cash | Stock Value | Total Value | | Revenue |
|---|---|---|---|---|---|---|
| 2021-03-08T00:00:00 | 0 | 1001410.0036621094 | $0.00 | $1,001,410.00 | 0.00% | -0.75% |
| 2021-03-09T00:00:00 | 200 | 923950.0061035156 | $77,718.00 | $1,001,668.01 | 0.03% | 0.33% |
| 2021-03-10T00:00:00 | 0 | 1001668.0053710938 | $0.00 | $1,001,668.01 | 0.00% | -0.05% |
| 2021-03-11T00:00:00 | 200 | 922922.0031738281 | $78,998.00 | $1,001,920.00 | 0.03% | 0.32% |
| 2021-03-12T00:00:00 | 400 | 844208.0017089844 | $158,243.99 | $1,002,452.00 | 0.05% | 0.52% |
| 2021-03-15T00:00:00 | 600 | 765040.0024414062 | $238,806.01 | $1,003,846.01 | 0.14% | 0.55% |
| 2021-03-16T00:00:00 | 0 | 1003846.0083007812 | $0.00 | $1,003,846.01 | 0.00% | -0.29% |
| 2021-03-17T00:00:00 | 0 | 1003846.0083007812 | $0.00 | $1,003,846.01 | 0.00% | 0.68% |
| 2021-03-18T00:00:00 | 200 | 924648.0102539062 | $78,586.00 | $1,003,234.01 | -0.06% | -0.77% |

## Blotters

| Date | ID | order type | Action | Order Price | Order Amou |
|---|---|---|---|---|---|
| 2021-02-25T00:00:00 | 1 | LMT | SELL | $383.78 | 0 | IVV |
| 2021-02-26T00:00:00 | 2 | MKT | BUY | $387.18 | 200 | IVV |
| 2021-03-01T00:00:00 | 3 | LMT | SELL | $391.03 | 200 | IVV |
| 2021-03-02T00:00:00 | 4 | LMT | SELL | $388.02 | 0 | IVV |
| 2021-03-03T00:00:00 | 5 | LMT | SELL | $382.84 | 0 | IVV |
| 2021-03-04T00:00:00 | 6 | MKT | BUY | $381.87 | 200 | IVV |
| 2021-03-05T00:00:00 | 7 | LMT | SELL | $385.07 | 200 | IVV |
| 2021-03-08T00:00:00 | 8 | MKT | BUY | $387.30 | 200 | IVV |
| 2021-03-09T00:00:00 | 9 | LMT | SELL | $388.59 | 200 | IVV |

## Yield-curve






# Suggest a Trade for next day

Here will show trade suggestion for next day.
Action type, Trading Symbol, Amount, Order Type, Price(only for limit order)

| | | | | | |
|---|---|---|---|---|---|
| SELL | IVV | 100 | LMT | | Confirm |