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CS677

I used the ticker DB, for Deutsche Bank.

**All data is displayed in the output of the program anduffy\_q2.py**

**Question 4.**

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| W | ticker | TP | FP | TN | FN | TPR | TNR | Accuracy |
| 2 | SPY | 296 | 0 | 0 | 209 | 58.61% | 0% | 58.61% |
| 3 | SPY | 200 | 96 | 0 | 209 | 48.90% | 0% | 39.60% |
| 4 | SPY | 208 | 88 | 25 | 184 | 53.06% | 22.12% | 46.14% |
| Ensemble | SPY | 248 | 48 | 0 | 209 | 54.27% | 0% | 49.11% |
| 2 | DB | 128 | 129 | 248 | 0 | 100% | 65.78% | 74.46% |
| 3 | DB | 128 | 129 | 194 | 54 | 70.33% | 60.06% | 63.76% |
| 4 | DB | 124 | 133 | 185 | 63 | 66.31% | 58.18% | 61.19% |
| Ensemble | DB | 128 | 129 | 223 | 25 | 83.66% | 63.35% | 69.50% |

It is clear that for the W2 datasets that, given the small list of possible options to scour the past 3 year dataset for (++,+-,--, and -+), that the predictive model may over or under use one of the signs as there is little margin for error there. This leads me to think that is why the 0% exists for W2 and W3 for SPY, and given that the ensemble is only made of the 3 W datasets, then their incorrect negative or positives overtake W4, leading to yet another 0% for TNR. The small list of options for W2 also leads to overuse of + for DB, hence the 100% TPR. If you always (or mostly) use positive, then you will never be wrong on positives!

It appears, however, despite some of the bad data from W2 or even W3, that these data sets are more or less the most accurate in both cases. Not only that, for DB in every category, it was more than 50%, so it could be used as a useful predictor in the future!

**Question 5.**

Chart, histogram

Description automatically generated

In the DB chart, it is clear that much of the time is spent keeping a cash position and not holding the stock, hence the steep divergence between the strategies and the buy and hold strategy as well as the notable straight lines in the orange and gray lines.

Graphical user interface, chart, line chart

Description automatically generated

In the SPY chart, since W2 always says to buy, it is in parity with the buy and hold pattern so you can barely even see the blue (Buy and Hold) line. Also, it is clear to see the economic crash last March due to COVID was unavoidable, even with algorithmic style trading. However, it is clear that the W2 or buy and hold style was more effective at rebounding than the ensemble!