Coding Task

1. For prediction data, each row is a prediction of a stock by the end of each month. For example, the first row means that the predicted score of 000001.SZ is 285.6875 on 2014-12-31 (the score is between 0 and 300 and the higher, the better). The GICS industry code of 000001.SZ is 4010. The predicted score is generated from some forecasting models.
2. For the daily data, each row shows the daily vwap (volume-weighted average price) and lowest price of the stock on that day.
3. Below, we set some rules for our monthly trading strategy. You are required to write Python programs to do backtesting.
4. We pick the top 10 stocks (exactly 10 stocks) for each month based on the predicted score. But we cannot choose more than 3 stocks with the same industry (the same GICS code). That is, if we find that there are more than 3 stocks in the same industry in the top 10 stocks, we go down the list until we reach 10 stocks and each industry can only include at most 3 stocks. We buy the stocks on the first day of each month and sell them on the first day of next month. The cost of those stocks is the vwap price on first day, and the selling price is the vwap price on the next month's first day.
5. We set a simple stop rule: if one individual stock's cumulative return (calculated by the **lowest price** of each day and the cost) drops below -5% on any day of the month, we have to sell it on that day. The realized return is the minimum of -5% and the return calculated by the vwap price of that day. Note that the triggering price and selling price are different. The rationale is that we do not have real-time data, so we use vwap price as an approximation for trading.
6. For those stocks that are not triggered by the stopping rule, we sell them all on the first day of next month with vwap prices, as explained in point 4 above.
7. Please give us the month by month portfolio return, and the detailed actions of each month. Please also send us your own programs so that we can replicate your results easily.