Time-Traveling Stock Trader

You are one of the world’s elite scientists. You have invented time travel. You have returned to 2015 with stock market data through 2020. You have $1,000.00 and deposit it in your account. Using the stock market data provided, determine a series of trades you will make to maximize the amount of money you will have in 2020.

The rules of trading:

1. You may not buy fractional shares of a stock. The quantity of stock you own must be a whole number.
2. You may not borrow money to buy stock. You may only use uninvested money in your account.
3. You may buy stock at either the Open or Low price of each day.
4. You may sell stock at either the Close/Last or High price of each day.
5. You may not perform multiple trades on the same stock in the same day.
6. You may buy multiple different stocks on the same day.
7. Stocks you own for less than one year will incur a 20% tax on the profit. Stocks you own for greater than or equal to one year will incur a 10% tax on the profit.
8. Stocks are sold in a first-in-first-out manner.
   1. i.e. If you buy 10 shares of XYZ on 1/1/2016 and 10 more shares on 1/1/2017, then sell 15 shares on 6/1/2017, the 10 shares purchased on 1/1/2016 will be sold first and incur a 10% tax (greater than one year) and 5 of the shares you purchased on 1/1/2017 will be sold second and incur a 20% tax (less than one year).
9. You may only make trades for stocks and dates which appear in the provided data.

The format of the data files:

1. Data files are organized in folders by year.
2. Each file represents one day of data. If a day is missing that means the market was closed.
3. There are seven columns of data
   1. The stock symbol
   2. The date
   3. The open price
   4. The high price
   5. The low price
   6. The close price
   7. The volume (i.e. number of shares traded; not needed for this application unless you deem it useful in some way)

The format of input for the judging program:

You should provide the judging program with the name of a file that has a series of trades to make in it. The contents of the file should contain the trades you wish to make line by line.

1. The format of a trade should be as such ACTION DATE SYMBOL QTY PRICE
   1. Action should be either BUY or SELL
   2. Date should be in MMDDYYYY format on the date you want to buy or sell
   3. Symbol should be the stock symbol you want to buy or sell
   4. Quantity should be a whole number of shares you want to buy or sell
   5. Price should be CLOSE, OPEN, HIGH, or LOW you want to buy or sell at
   6. Example: BUY 09162015 MSFT 20 OPEN
      1. This will buy 20 shares of MSFT at the open price on 9/16/2015.
2. The file will have only one trade per line.
3. The date on each line must be greater than or equal to the date on the line before it.
   1. i.e. the file must be ordered by trade date in ascending order, the order that the trades appear in for each date does not matter
4. Your account balance will be recalculated after each trade.
5. You must not own any stock at the end of your trade list. Your account must end all in cash.