Homework #4 Into to Auto Trading Systems

Due date: March 11, 2019

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Important Note: No late homework will be accepted. *Answers should contain both the Matlab program, and screen snap shorts to demonstrate correct running of the program.*

The purpose of this homework is to ask you to transport what you have done in HW 3 for back-testing to your Algo Trading system. The only differece is to build up the data.

Problem 1. Adapt what you have done in HW3 Problem 1 for back testing to an Algo Trading System. To fix ideas, use 3 minute bar data for your system. Your system's program should contain the following steps:

- (1). Download the yesterday's historical data 3 minute bar data at the start of the system. But only do it once.
- (2). Download today's real time 3 minute bar data every 3 minute
- (3). Merge the above two data so that you have the complete data for computing trading indicator and signals.
- (4). Computing the MA(m) and MA(n) series using the complete data
- (5). Computing the trading signal using upcrossing and downcrossing. If the trading signal occurs, trade and record the time index and buy/sell decisions and prices. Update the system state variables.
- (6). Compute cumulative profit and loss (or cumulative returns) for your trading since start of your system.

For the above, you can just use a particular (m, n) you see appropriate, say $m = 3, n = 20$. For this problem, assume you always buy 100 shares.

Problem 2. Improve your Algo Trading system in the following aspects:

- Trading with capital limit (say $1,000,000) and not just fixed number of shares. For this, you need to write a function that computes the largest number of shares you can buy/sell with $1,000,000, using the current market price quote.
- Add Stop Loss to your system.