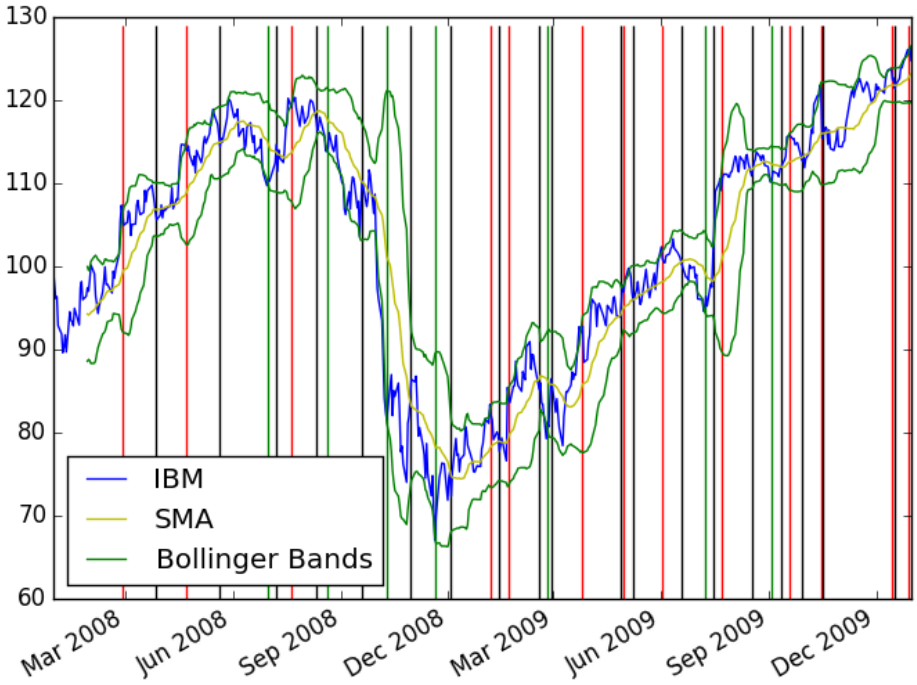
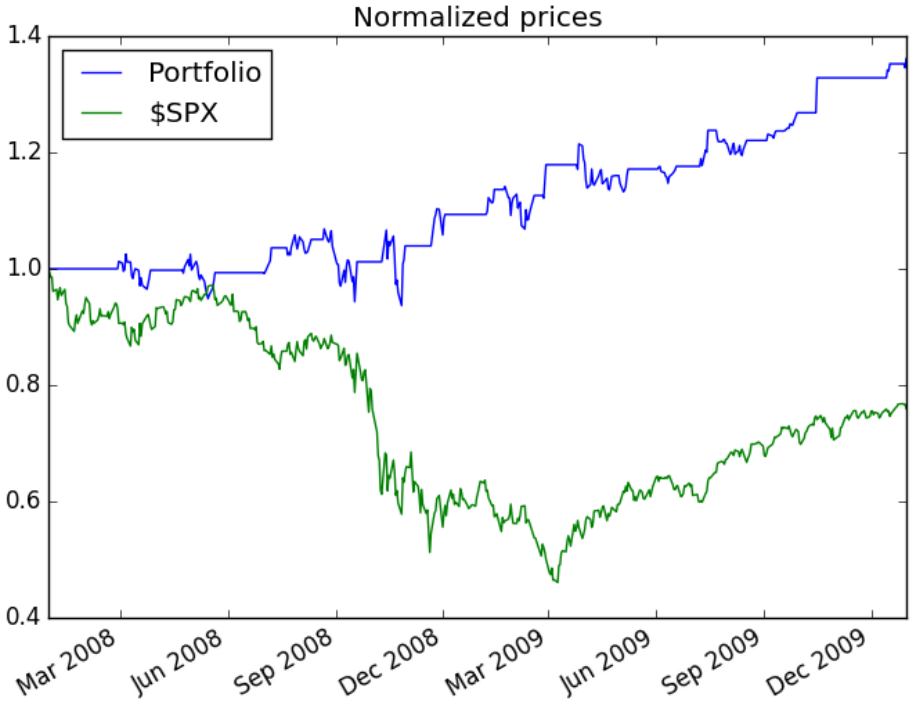
Part I :Bollinger Strategy

1. Bollinger Band strategy chart



2. Bollinger Band Backtest Chart



3. Summary of Bollinger Band backtest performance metrics

Data Range: 2007-12-31 to 2009-12-31

Sharpe Ratio of Fund: 0.97745615082
Sharpe Ratio of $SPX: -0.21996865409

Cumulative Return of Fund: 0.3614
Cumulative Return of $SPX: -0.240581328829

Standard Deviation of Fund: 0.0108802922269
Standard Deviation of $SPX: 0.0219524869863

Average Daily Return of Fund: 0.000669942567631
Average Daily Return of $SPX: -0.000304189525556

Part II My strategy

1. Description:

My strategy is an amelioration of Bollinger Band strategy.

I simply substitute the rolling mean by (rolling mean+-1/2* rolling standard deviation by 20 days).

When price crosses from out side of regular Bollinger Band, I do out put

sell/buy signal as regular Bollinger Strategy does.

When I am in a short position, I check if the price hit (rolling mean+ 1/2 times of the rolling standard deviation). If so, I end my position and wait for next trading signal.

When I am in a long position, I check if the price hit (rolling mean – 1/2 times of the rolling standard deviation). If so, I end my position and wait for next trading signal.

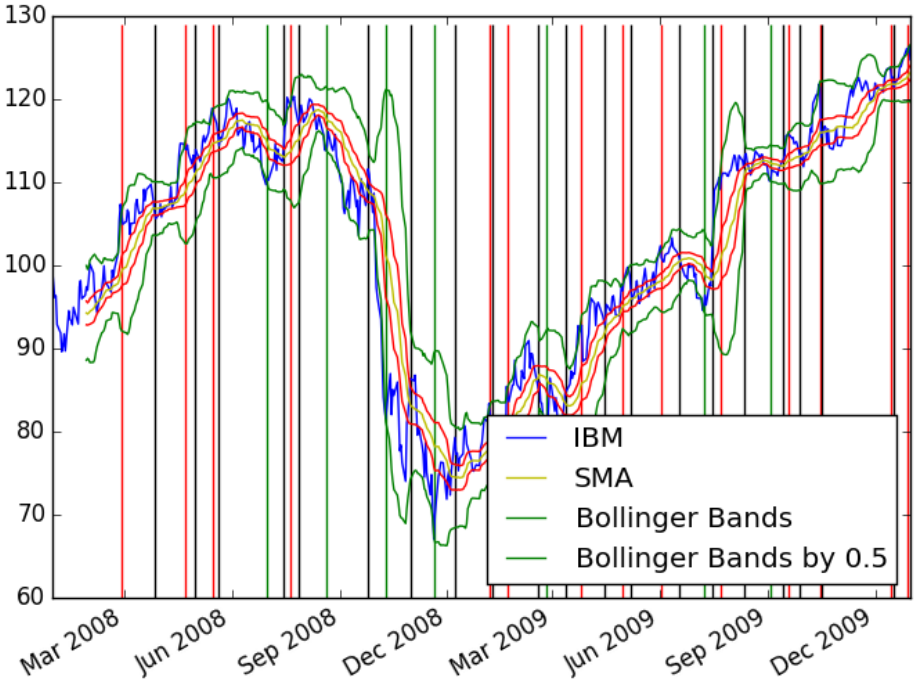
Here is the pseudocode of my strategy:

```
for time from start_date to end_date do:
    Check my position:
        If position is 0:
         If price cross from higher position of regular upper Bollinger Band
         (Rolling mean + 2* rolling standard deviation):
                Output 'Sell' signal
         elif price cross from lower price of regular lower Bollinger Band
         (Rolling mean - 2* rolling standard deviation):
                outpu 'Buy' signal
        elif position is short or long:
         if price cross hit (rolling mean-1/2* rolling standard deviation by 20
         days) or hit (rolling mean+1/2* rolling standard deviation by 20
         days):
            end my position to 0
```

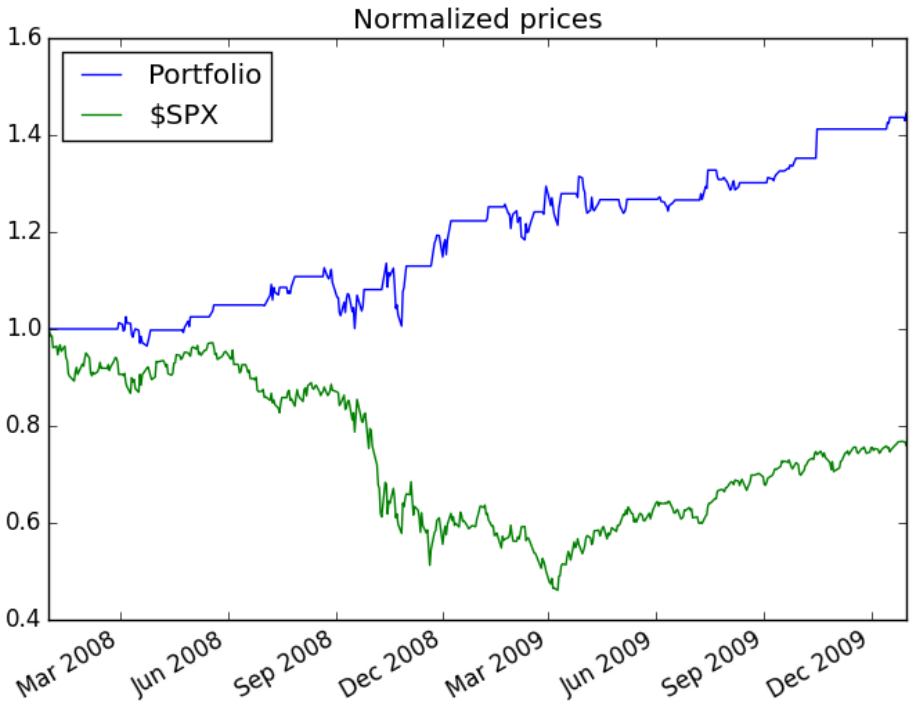
2. Justification and discussion:

   The strategy outperforms Bollinger Band strategy simply because it helps to capture more profitable trading points. As one may notice, when price fluctuates more between any one of the regular Bollinger bands and rolling mean but never touch each other in a certain period, there are more profitable point that is missed by regular Bollinger strategy. As a result, although I sacrifice some profit by end the strategy a little bit earlier, I still out perform the regular Bollinger strategy by capture more profitable point. Yet, the (rolling mean+-1/2* rolling standard deviation by 20 days) bands introduced in my strategy are certainly not an optimal choice, we may use dynamic coefficient for the width of end signal band. In regular Bollinger band strategy, the width is 0, while in my strategy, the width is 1 times rolling standard deviation by 20 days. The optimal choice of the width is actually depending on how much the stock will change in a monotonically before it goes back.

3. My strategy chart



4. My Strategy Backtest Chart



5. Summary of My Strategy backtest performance metrics:
   Data Range: 2007-12-31 to 2009-12-31

   Sharpe Ratio of Fund: 1.17525716464
   Sharpe Ratio of $SPX: -0.21996865409

   Cumulative Return of Fund: 0.4454
   Cumulative Return of $SPX: -0.240581328829

   Standard Deviation of Fund: 0.0106129457995
   Standard Deviation of $SPX: 0.0219524869863

   Average Daily Return of Fund: 0.000785721402752
   Average Daily Return of $SPX: -0.000304189525556

   Final Portfolio Value: 14454.0