Question One

Check data for one month 1-minute data.

Command:
data = IBMatlab('action','history', 'symbol','IBM', 'barSize','1 min', 'useRTH',1 , 'DurationValue',30, 'DurationUnits', 'D')

Ans:

data =

struct with fields:

dateNum: [1×11700 double]
dateTime: {1×11700 cell}
open: [1×11700 double]
high: [1×11700 double]
low: [1×11700 double]
close: [1×11700 double]
volume: [1×11700 double]
count: [1×11700 double]
WAP: [1×11700 double]
hasGaps: [1×11700 logical]

Write the function to find moving average

```
function ma = myma(price,n)
% price is the close price of stock
% n is the moving average window for mean average
len = length(price);
% check for nan
ma = nan(len,1);
% calculate the moving average for n days
for i = n:len
    ma(i) = sum(price(i-n+1:i))/n;
end

end
```

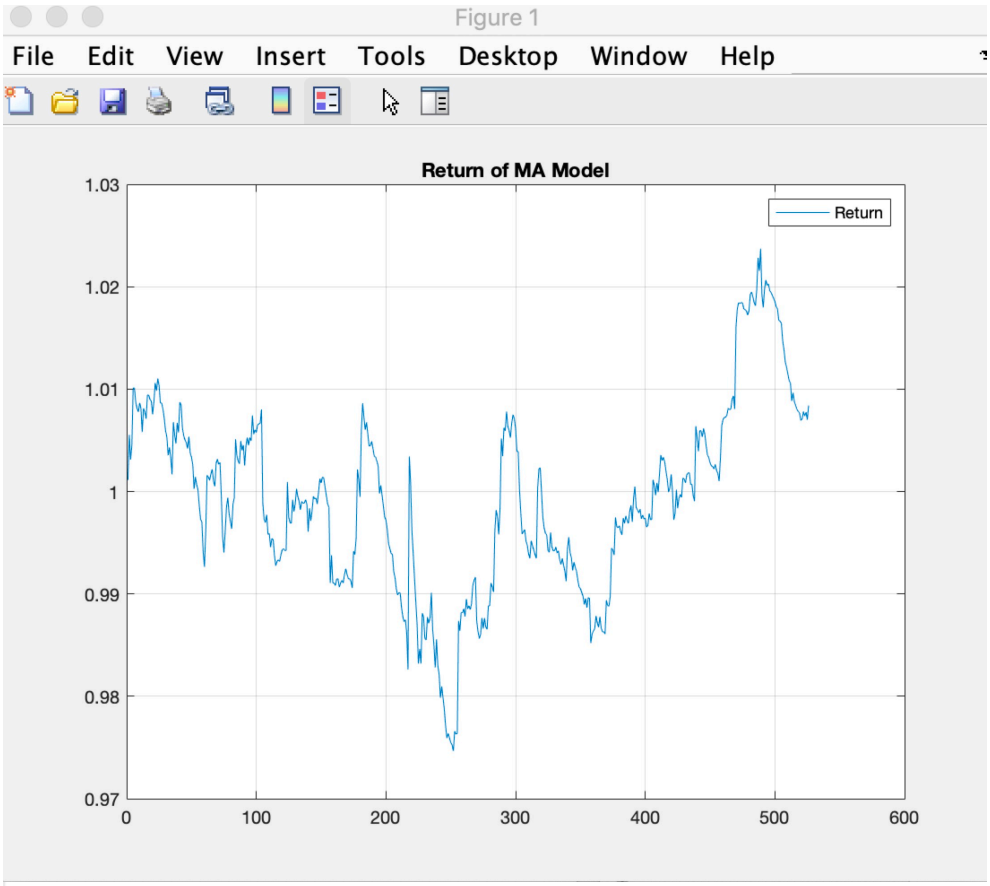
Write the function to buy and sell based on golden folk of moving average strategy and plot the gain and loss.

```
function  onemonth_return=ma_strategy(data,short,long)
% data for what we downloaded from IB
% short for short moving average window
% long for long moving average window
```

```
data_close = data.close;
% calculate moving average for short window and long window
ma_s = myma(data_close,short);
ma_l = myma(data_close,long);
% define buy and sell
buy = [];
sell = [];
% find out golden folk
for i = 5:length(data_close)
    if ma_s(i-1) < ma_l(i-1) && ma_s(i) >= ma_l(i)
        buy = [buy;i];
    elseif ma_s(i-1) > ma_l(i-1) &&  ma_s(i) <= ma_l(i) && ~isempty(buy)
        sell = [sell;i];
    end
end

% if we still have stock on hand, we could sell it in the end
if length(buy) ~= length(sell)
    sell= [sell;length(data_close)];
end
% find out return with simple return method
r = ((data_close(sell) - data_close(buy)) ./ data_close(buy))+1;
% find out cummulated return
total_r= cumprod(r);
onemonth_return = total_r(end)
fprintf('Cumulative return for MA(%d,%d) in last month
is %.4f %%\n',short,long,total_r(end));
% plot the gain and loss line picture
plot(total_r);grid on;
legend('Return');
title(['Return of MA Model']);
end
```

```
## Run the fuction
>> total_r = ma_strategy(data,5,13)
```




```
Cumulative return for MA(5,13) in last month is 1.0084 %

total_r =

    1.0084
```

Question 2

After running several MA functions with different moving average window. MA (5,13) would be the best one for IBM one month per min data.