%% create the stock and call payoff vectors

stock = [1:100]';

for i = [1:20]

for j = [1:100]

call(i,j) = max(stock(j)-5\*i,0);

put(i,j) = max(5\*i - stock(j),0);

end

end

%% Import portfolio profile

%% see portfolio payoff

plot(stock,portfolio)

%% transpose

call = call';

put = put';

%% Calls?

plot(call);

%% puts??

plot(put);

%% create x vector

x = [call put];

%% take the negative piece of portfolio

negativeportfolio =min(portfolio,0);

%negativeportfolio = negativeportfolio';

%%

b = regress(negativeportfolio, x);

%%

aftersurgery = portfolio - x\*b;

%% plot and check!

plot(stock,portfolio);

hold on;

plot(stock, aftersurgery);

%% see piecewise linear approximation

optionpayoff = x\*b;

plot(stock([1:100]), portfolio([1:100]));

hold on

plot(stock([1:100]),optionpayoff([1:100]));

hold off