clc; clear all; close all;

mean = 1152;

stdev = 440;

s = 0.005344;

c = 0.022243;

optimal = 841;

% consider stock-out cost &holding host change 80%~120%

s = s\*0.8:0.03\*s:s\*1.2;

c = c\*0.8:0.03\*c:c\*1.2;

[s, c] = meshgrid(s, c);

pnums = size(s,2);

tc = zeros(pnums, pnums);

syms r;

for i=1:pnums

for j=1:pnums

%using the Gauss Distribution to find the optimal solution, given s(i, j)&c(i, j)

ratio = s(i, j)/c(i, j);

optimal = norminv(ratio, mean, stdev);

tc(i, j) = double(int(c(i, j)\*(optimal-r)\*1/(stdev\*sqrt(2\*pi))\*exp(-(r-mean)\*(r-mean)/(2\*stdev\*stdev)), r, 0, optimal)+...

int(s(i, j)\*(r-optimal)\*1/(stdev\*sqrt(2\*pi))\*exp(-(r-mean)\*(r-mean)/(2\*stdev\*stdev)), r, optimal, inf));

end

end

% plot sensitivity graph

h = surf(s, c, tc);