load('snp452-data');

%remove outlier No.274, No.408

Xr = X;

Xr(:,274) = [];

Xr(:,407) = [];

rate\_M = zeros(1257,450);

%normalize data

for i = 1:1257

 rate\_M(i,:) = log(Xr(i+1,:)./Xr(i,:));

end

Mean = rate\_M \* ones(450)/450;

rate\_M\_t = rate\_M - Mean;

[U,S,V] = svd(rate\_M\_t);

% s = svd(rate\_M\_t);

% s2 = s.\*s/450;

% sums = sum(s2);

% s2 = s2/sums;

% plot(s2,'\*');

%%%U1U2 subspace plot:

x1 = U(:,1)'\*rate\_M\_t;

x2 = U(:,2)'\*rate\_M\_t;

plot(x1,x2,'\*');

k = 1;

for i = 1:452

 if (i~=274)&&(i~=408)

 J{k} = stock{i}.class;

 k=k+1;

 end

end

New=find(contains(J,"Material"));

Nx1 = U(:,1)'\*rate\_M\_t(:,New);

Nx2 = U(:,2)'\*rate\_M\_t(:,New);

plot(x1,x2,'\*');

hold on

plot(Nx1,Nx2,'r\*');

%Parallel analysis

% permuteM = zeros(450,101);

% s = svd(rate\_M\_t);

% permuteM(:,1) = s;

% Temp = rate\_M\_t;

% tempv = Temp(1,:);

% for i = 1:100

% Temp = rate\_M\_t;

% for j = 1:1257

% tempv = Temp(j,:);

% Temp(j,:) = tempv(randperm(length(tempv)));

% end

% s = svd(Temp);

% permuteM(:,i+1) = s;

% end

% Num = zeros(1,450);

% for i = 1:450

% count = 0;

% for j = 2:101

% if permuteM(i,j) > permuteM(i,1)

% count = count + 1;

% end

% end

% Num(i) = count/100;

% end

% plot(Num,'\*');