

hw4q2

May 9, 2020

1 HW4 Computing Problem 2

```
[1]: %% Q1
clc; cla; clf; clear all; close all; % Initial Clean-up for multiple tries
iptsetpref('ImshowBorder', 'tight');format compact; % Set preferences
```

Reading in the data

```
[2]: k = 1;
for i = 2:3 %task i
    for j = 0:9 %trial j
        data(:,k) = reshape(load(sprintf('class-%d_seq-%d', i,j)),1040*19,1);
        k = k+1;
    end
end
end
```

```
[3]: size(data)
```

```
ans =
    19760         20
```

compute the centers m1 and m2?

```
[21]: m1 = sum(data(:,1:10),2)/10;
m2 = sum(data(:,11:20),2)/10;
```

```
[22]: size(m1)
```

```
ans =
    19760         1
```

```
[23]: size(m2)
```

```
ans =
    19760         1
```

```
[24]: M = data'*(m1-m2);
```

```
[25]: size(M)
```

```
ans =  
    20     1
```

```
[26]: Pb = M*(M');
```

```
[27]: size(Pb)
```

```
ans =  
    20    20
```

```
[28]: M = data'*[data(:,1:10)-m1, data(:,11:20)-m2];
```

```
[29]: size(M)
```

```
ans =  
    20    20
```

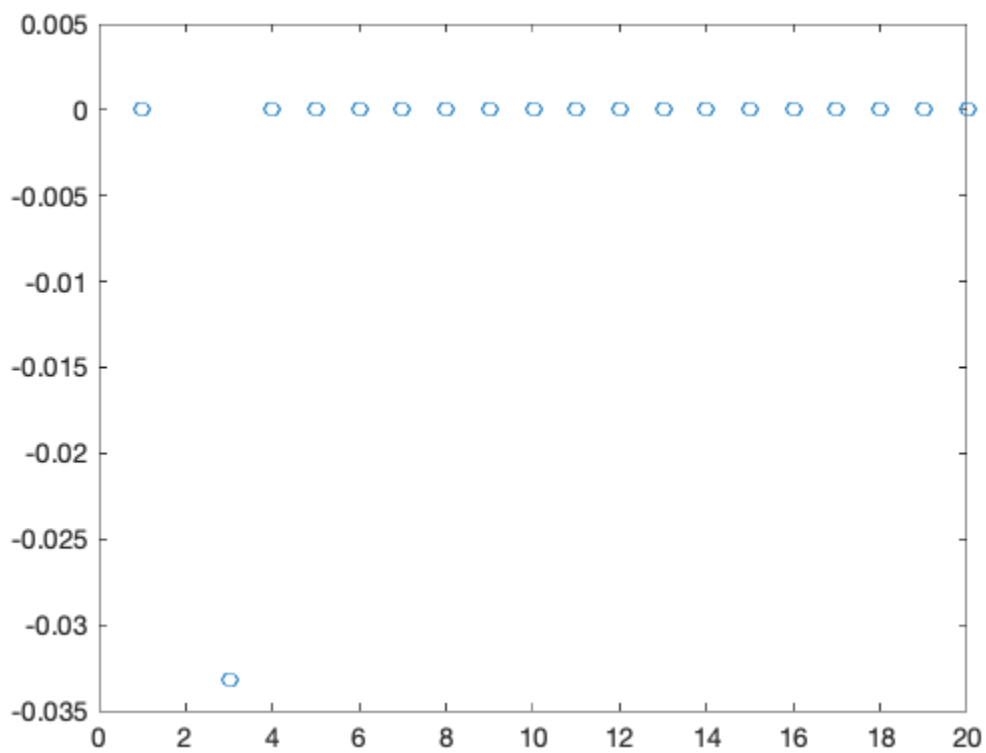
```
[30]: Pw = M*(M');
```

```
[31]: size(Pw)
```

```
ans =  
    20    20
```

```
[15]: [V,D] = eig(Sb,Sw);
```

```
[16]: plot(diag(D),'o')
```



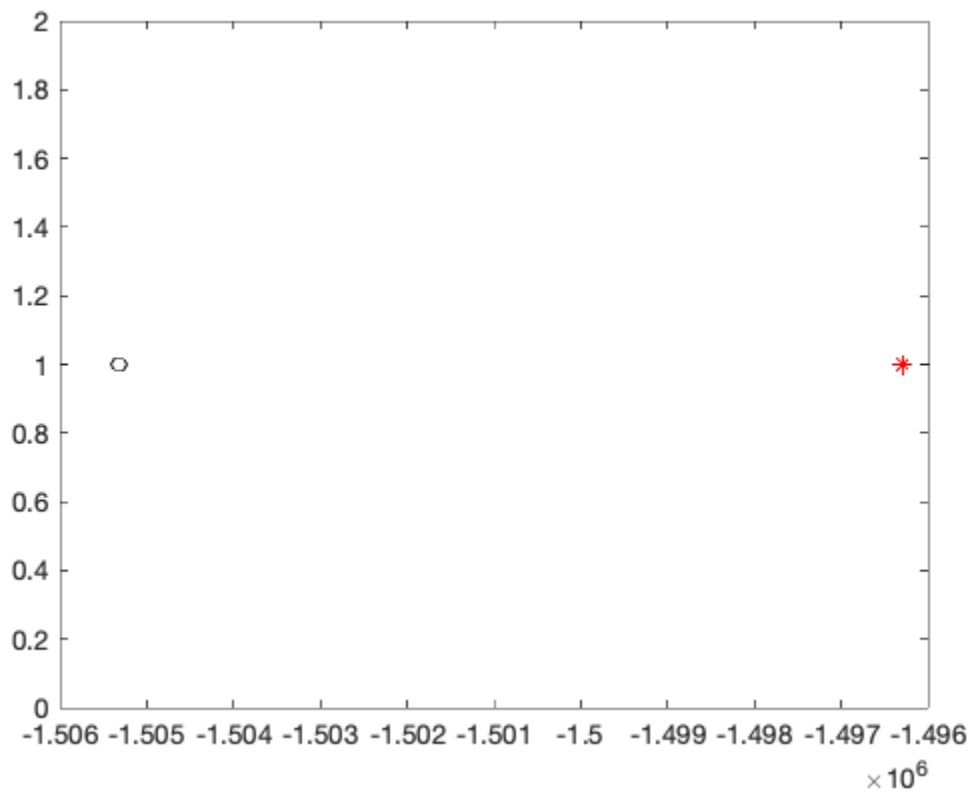
```
[17]: w = data*V(:,2);
```

```
[18]: size(w)
```

```
ans =
```

```
19760      1
```

```
[19]: plot(data(:,1:10)'*w,ones(10,1),'r*');
hold on;
plot(data(:,11:20)'*w,ones(10,1),'ko');
```



[]: