**Q1]**

**1)**

>> x=[60 18.4;85.5 16.8;64.8 21.6;61.5 20.8;87 23.6;110.1 19.2;108 17.6;82.8 22.9;69 20;93 20.8;51 22;81 20]

x =

60.0000 18.4000

85.5000 16.8000

64.8000 21.6000

61.5000 20.8000

87.0000 23.6000

110.1000 19.2000

108.0000 17.6000

82.8000 22.9000

69.0000 20.0000

93.0000 20.8000

51.0000 22.0000

81.0000 20.0000

>> m1=mean(x) # m1= sample mean vector based on x

79.4750 20.3083

>> y=[75 19.6;52.8 20.8;64.8 17.2;43.2 20.4;84 17.6;49.2 17.6;59.4 16;66 18.4;47.4 16.4;33 18.8;51 14;63 14.8]

y =

75.0000 19.6000

52.8000 20.8000

64.8000 17.2000

43.2000 20.4000

84.0000 17.6000

49.2000 17.6000

59.4000 16.0000

66.0000 18.4000

47.4000 16.4000

33.0000 18.8000

51.0000 14.0000

63.0000 14.8000

>> m2=mean(y) # m2= sample mean vector based on y

m2 =

57.4000 17.6333

>> sx=x'\*x-(12)\*m1'\*m1 #sx=sssp matrix based on x

sx =

1.0e+003 \*

3.8791 -0.1283

-0.1283 0.0473

>> sy=y'\*y-(12)\*m2'\*m2 #sy=sssp matrix based on y

sy =

1.0e+003 \*

2.2078 -0.0285

-0.0285 0.0491

>> s=sx+sy

#s= pooled sssp matrix

s =

1.0e+003 \*

6.0868 -0.1568

-0.1568 0.0964

>> n1=12

n2=12

f=n1+n2-2 # d.f

n1 =

12

n2 =

12

f =

22

>> d=(m1-m2)

d =

22.0750 2.6750

>> lx=f\*d\*inv(s) # lx= sample discrIminant function

lx =

0.0997 0.7729

**2)**

>> lx1=lx\*x1'

lx1 =

31.3961

>> C=.5\*lx\*(m1+m2)' # C=.5\*lx\*(m1+m2)'

C =

21.4848

**Interpretation:**

Here lx1> C

Therefore x assign to π1

**Q2]**

**1)**

>> m1=[2.5 3.1 2.8]' # m1= sample mean vector based on x

m1 =

2.5000

3.1000

2.8000

>> m2=[1.1 4.4 5.2]' # m1= sample mean vector based on y

m2 =

1.1000

4.4000

5.2000

>> n1=60

n2=50

n1 =

60

n2 =

50

>> S=[12.7 2.1 3.1;2.1 18.5 6.1;3.1 6.1 20.1] #S= pooled matrix

S =

12.7000 2.1000 3.1000

2.1000 18.5000 6.1000

3.1000 6.1000 20.1000

>> d=m1-m2

d =

1.4000

-1.3000

-2.4000

>> l=inv(S)\*d # l= sample discrIminant function

l =

0.1491

-0.0447

-0.1288

**2)**

>> x=[3.1 2.2 3.1]'

x =

3.1000

2.2000

3.1000

>> lx=l'\*x

lx =

-0.0356

>> C=.5\*l'\*(m1+m2)

C =

-0.4146

**Interpretation:**

Here lx> C

therefore x assign to π1

**Q3]**

>> m1=[3.23 6.59 .30] # m1= sample mean vector based on x

m1 =

3.2300 6.5900 0.3000

>> m2=[4.44 5.67 .34] # m1= sample mean vector based on y

m2 =

4.4400 5.6700 0.3400

>> s=[187.6 1.96 -4.03;1.96 147.79 2.13;-4.03 2.13 3.6] #S= pooled matrix

s =

187.6000 1.9600 -4.0300

1.9600 147.7900 2.1300

-4.0300 2.1300 3.6000

>> l=inv(s)\*d' # l= sample discrIminant function

l =

-0.0070

0.0066

-0.0229

>> x=[15.1 5.5 .35]'

x =

15.1000

5.5000

0.3500

>> lx=l'\*x

lx =

-0.0773

>> C=(1/2)\*l'\*(m1+m2)'

C =

0.0065

>>

**Interpretation:**

Here lx<C

Therefore x assign to π2