6-20

(a) $9.5 \Rightarrow 9.55$

$$Z = \frac{9.55-8}{0.9} = 1.72$$

$$P(Z > 1.72) = 1 - 0.9573 = 0.0427$$

(b)

$$Z = \frac{8.65-8}{0.9} = 0.72$$

$$P(Z < 0.72) = 0.7642$$

(c)

$$Z_1 = \frac{9.15-8}{0.9} = 1.28 \quad , \quad Z_2 = \frac{7.25-8}{0.9} = -0.83$$

$$P(Z < 1.28) - P(Z < -0.83) = 0.8997 - 0.2033 = 0.6964$$

6-28

$$\mu = 100 \times 0.72 = 72 \quad , \quad \sigma = 4.489$$

(a)

$$Z = \frac{80.5-72}{4.489} = 1.894$$

$$P(Z > 1.894) = 1 - 0.9706 = 0.0294$$

(b)

$$Z = \frac{67.5-72}{4.489} = -1.002$$

$$P(Z < -1.002) = 0.1539$$

CS 扫描全能王

6.58

$\beta = \frac{1}{5}$, $\alpha = 10$

(a) $P(X \geq 10) = 1 - P(X < 10) = 1 - 0.9863 = 0.0137$ #

(b) $P(X \leq 2) = \int_0^2 \frac{1}{\beta^\alpha} \frac{x^{\alpha-1} e^{-x/\beta}}{\Gamma(\alpha)} \, dx$

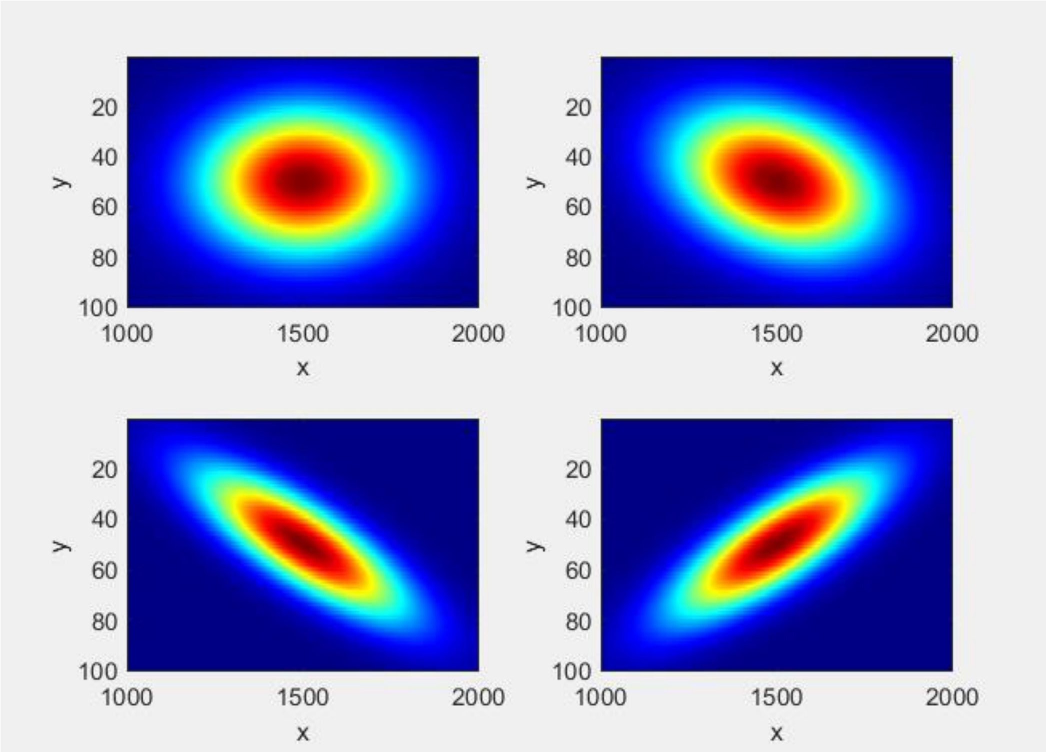
let $z = \frac{x}{\beta}$, $dz = \frac{1}{\beta} dx$

$P(X \leq 2) = P(Y \leq 10) = \int_0^{10} \frac{y^{\alpha-1} e^{-y}}{\Gamma(\alpha)} \, dy = F(10;10) = 0.542$

$P(X > 2) = 1 - P(X \leq 2) = 1 - 0.542 = 0.458$ #

CS 扫描全能王

1.(a)



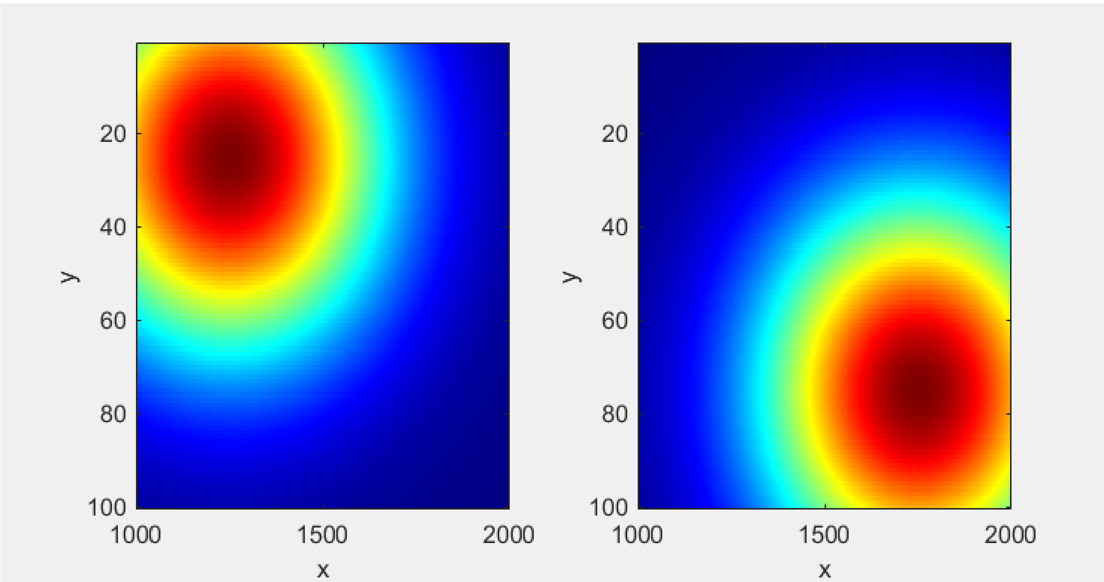
1.(b)

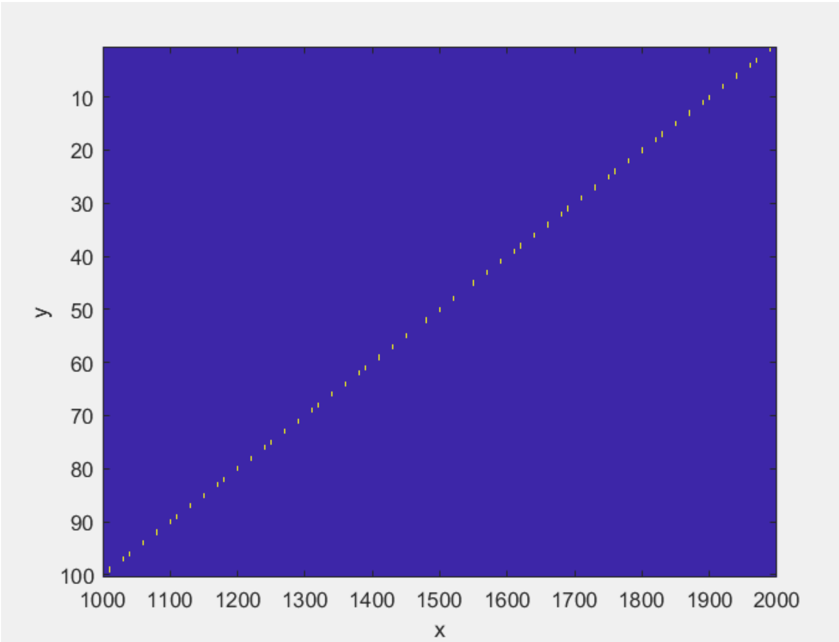
From the plot of distribution 1 and 2 , we found that as the value of correlation higher , the plot will tilt more and become more flat.

From the plot of distribution 3 and 4 , we found that the plot will be symmetrical to y axis as the value of correlation change from positive to negative

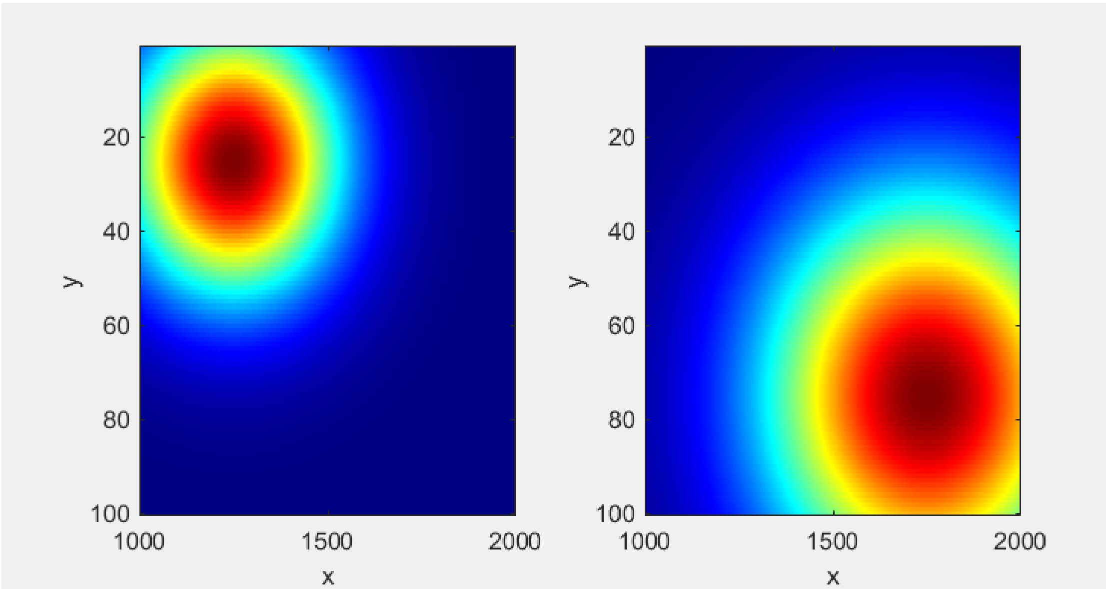
2(a)

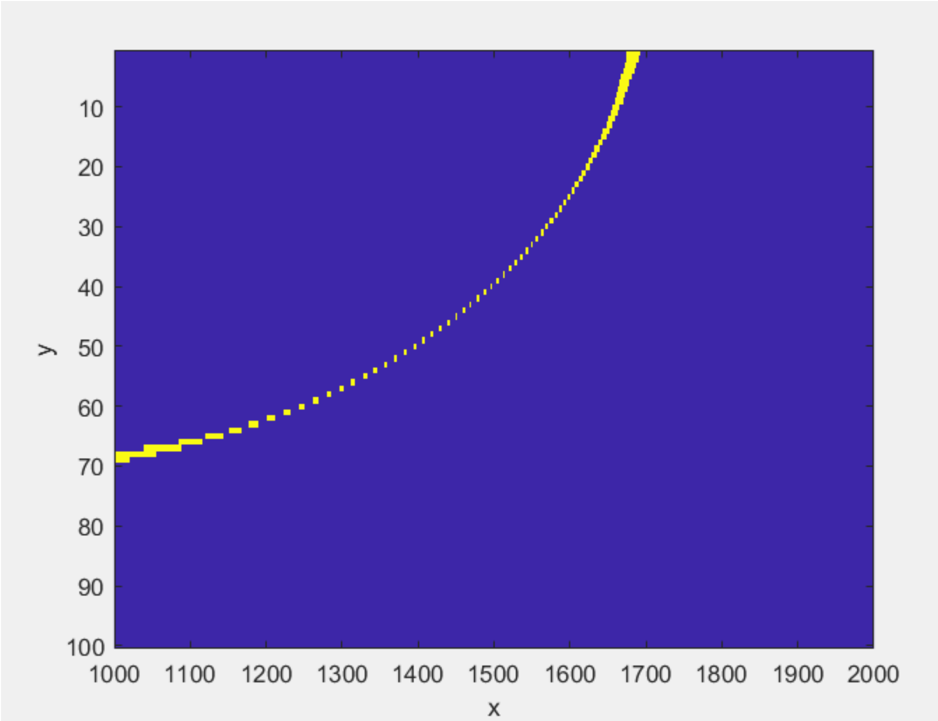
Case1




y
10
20
30
40
50
60
70
80
90
100
1000 1100 1200 1300 1400 1500 1600 1700 1800 1900 2000
x

Case2

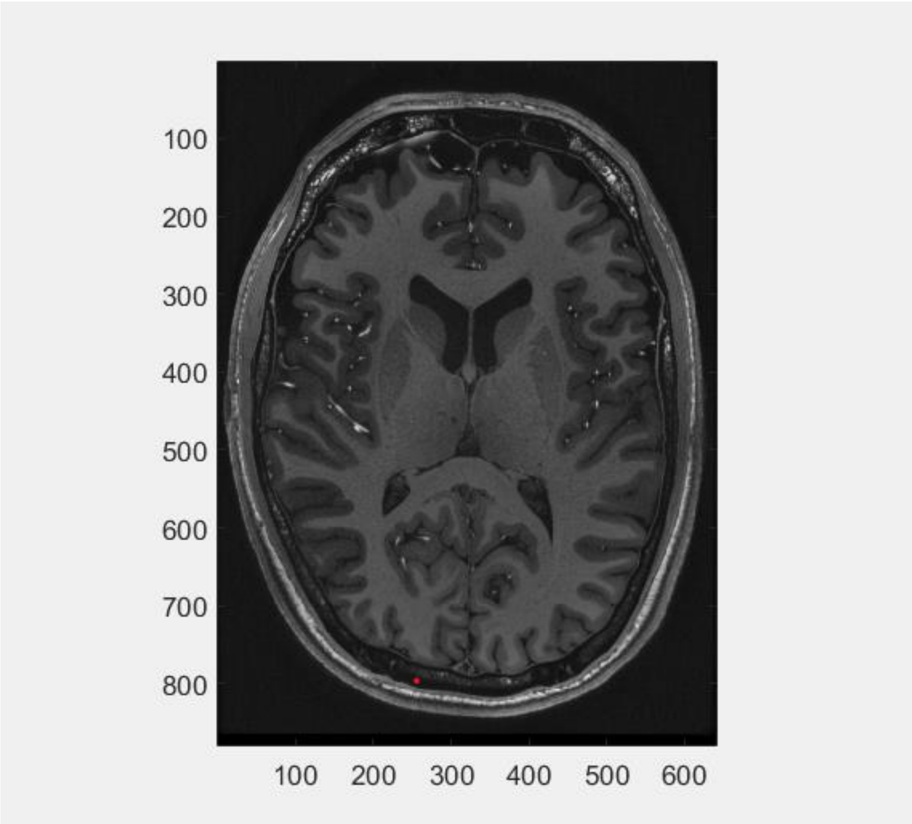

y
20
40
60
80
100
1000 1500 2000
x
y
20
40
60
80
100
1000 1500 2000
x



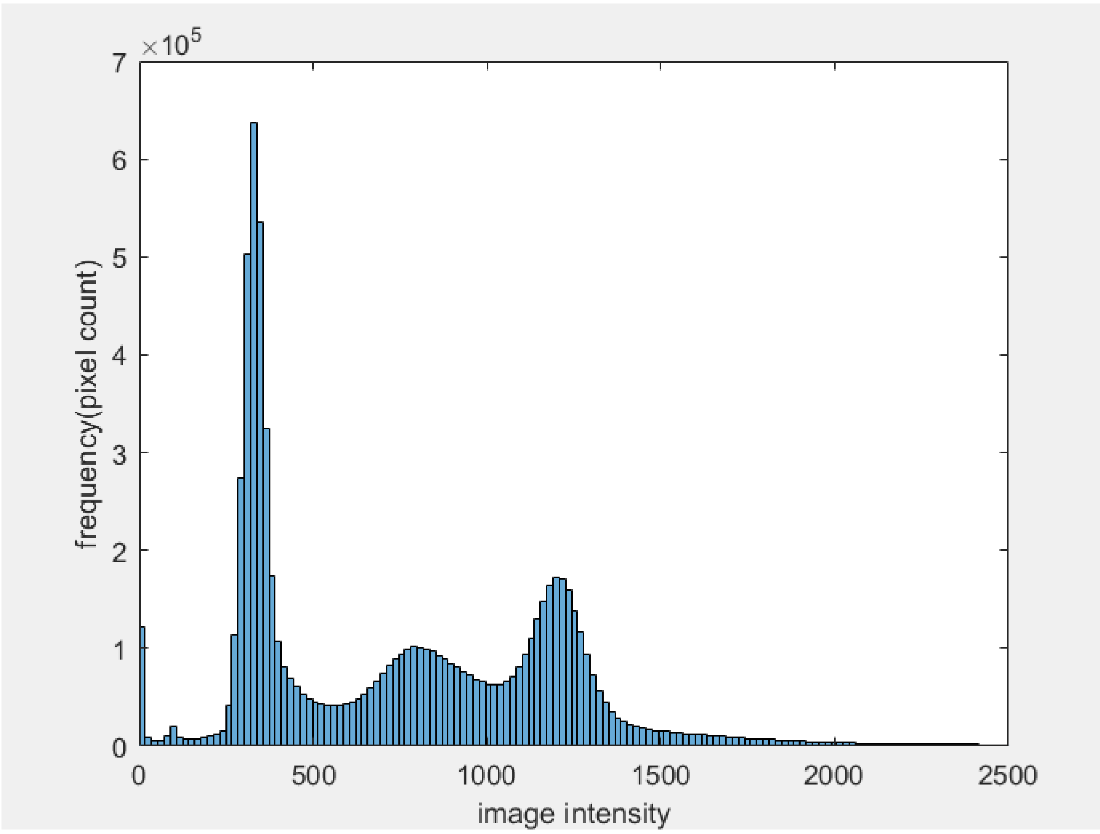
2.(b)

The decision boundary will differ according to the gap of each data ,that is, its sigma .
As the sigma goes lower , the boundary will be close to that side.

3(a)

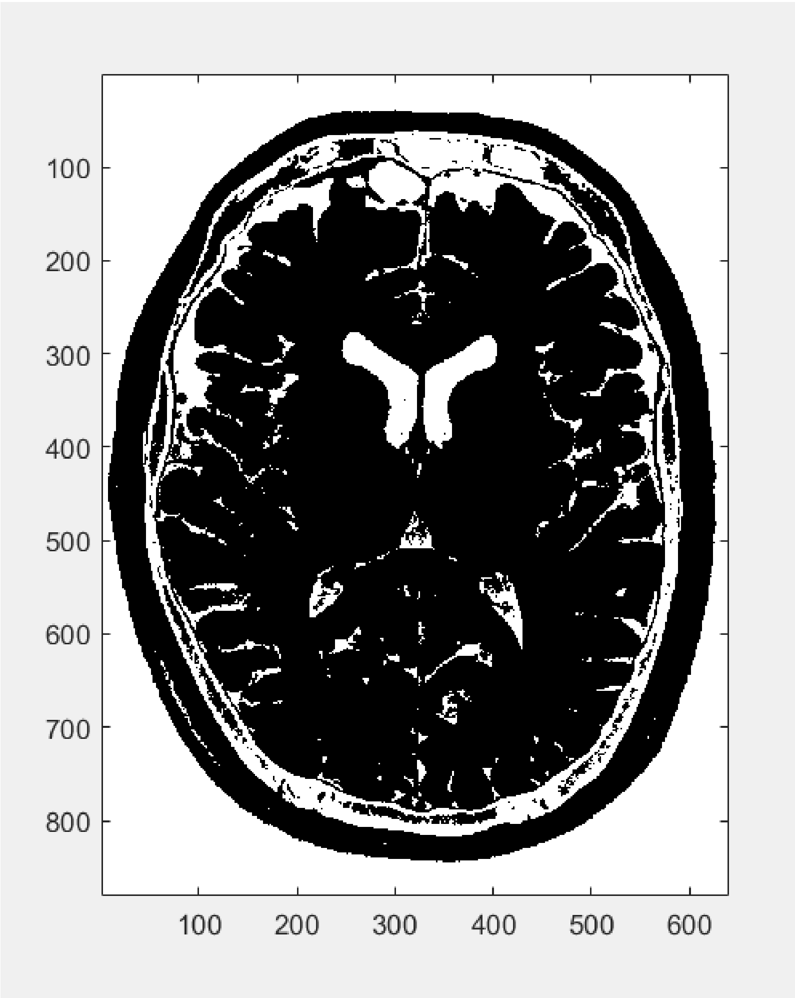

100
200
300
400
500
600
700
800
100
200
300
400
500
600

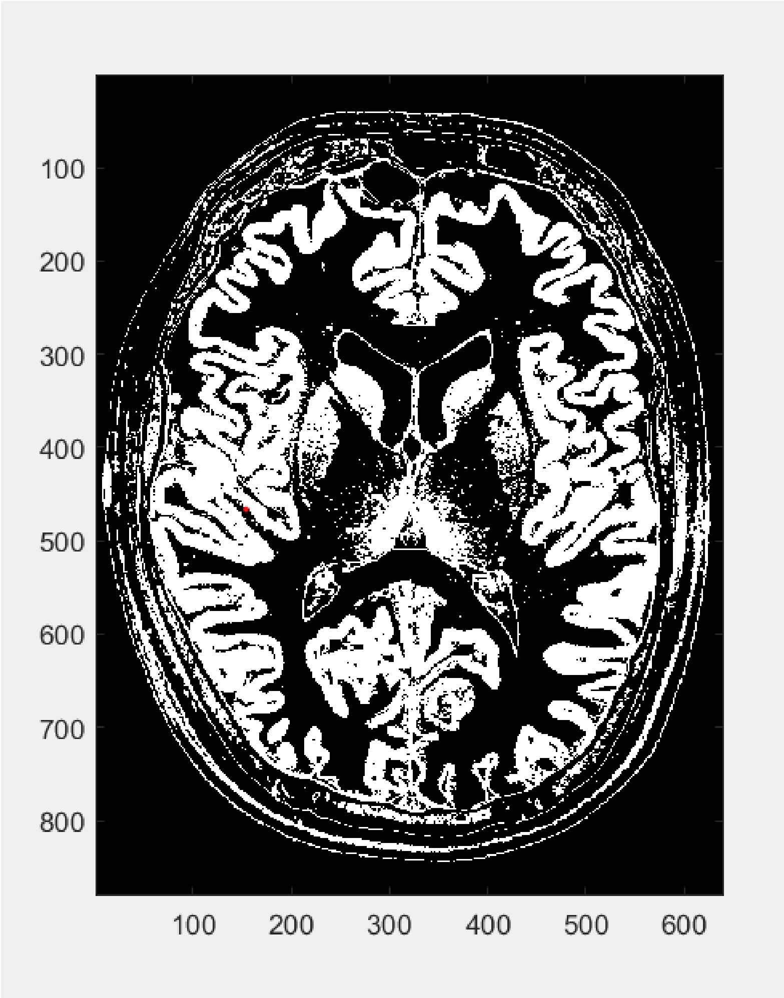
3(b)

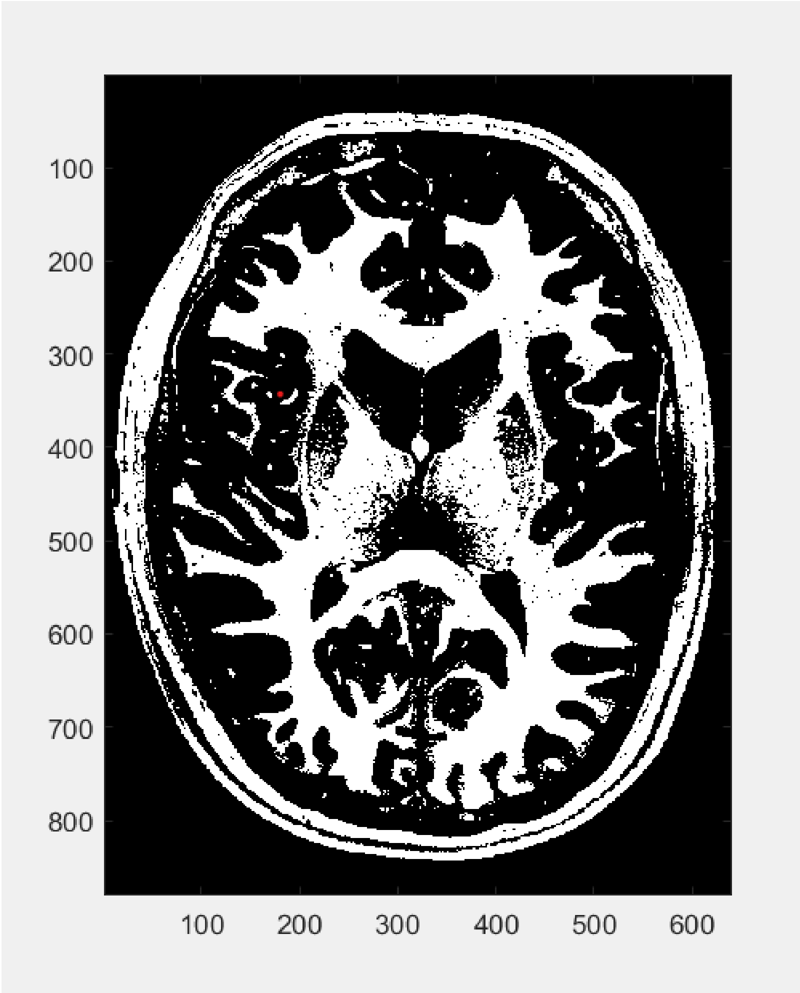

$\times 10^5$
7
6
5
4
3
2
1
0
frequency(pixel count)
0
500
1000
1500
2000
2500
image intensity

3(c)

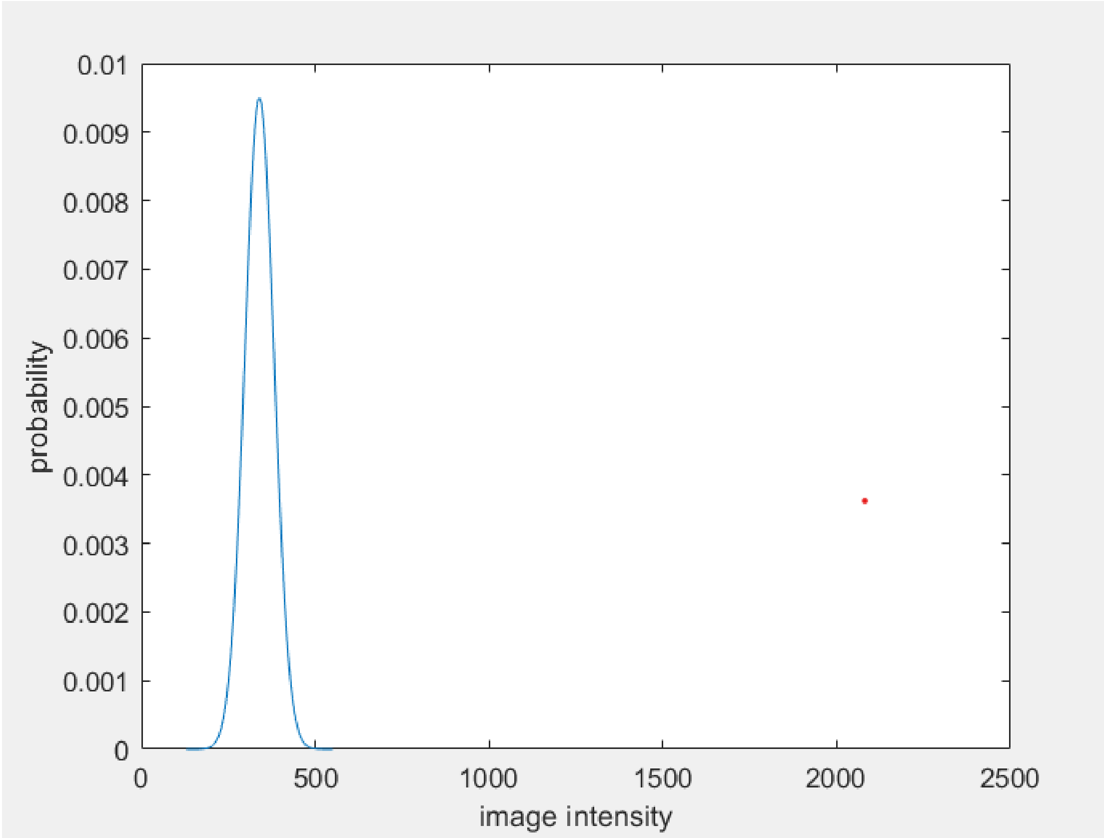
First range = [0 559],second range = [560 1021],third range [1022 end]

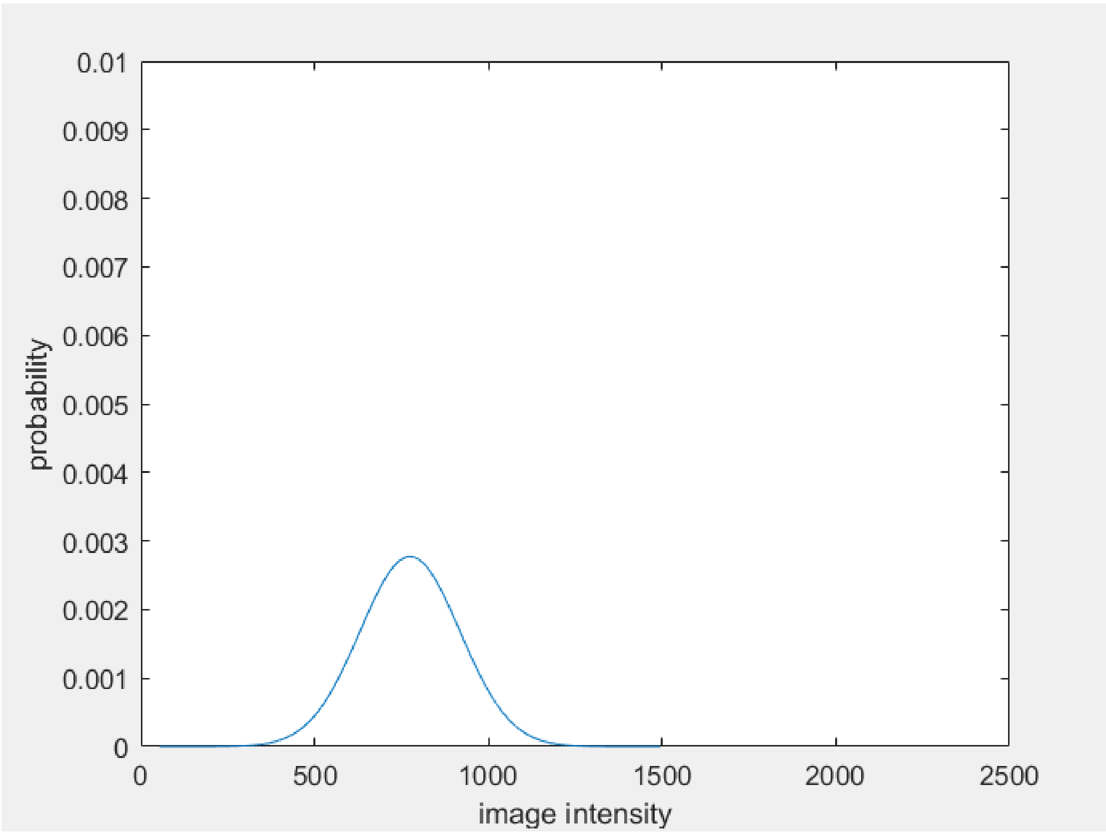


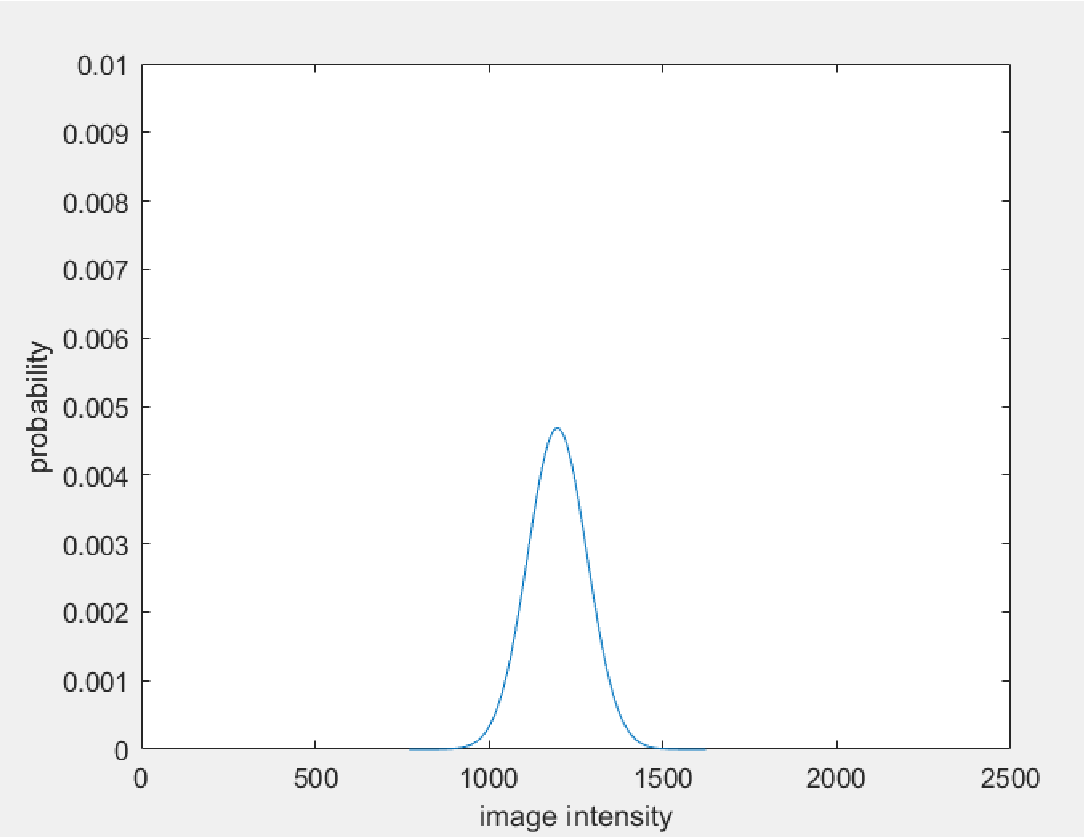

100
200
300
400
500
600
700
800
100
200
300
400
500
600



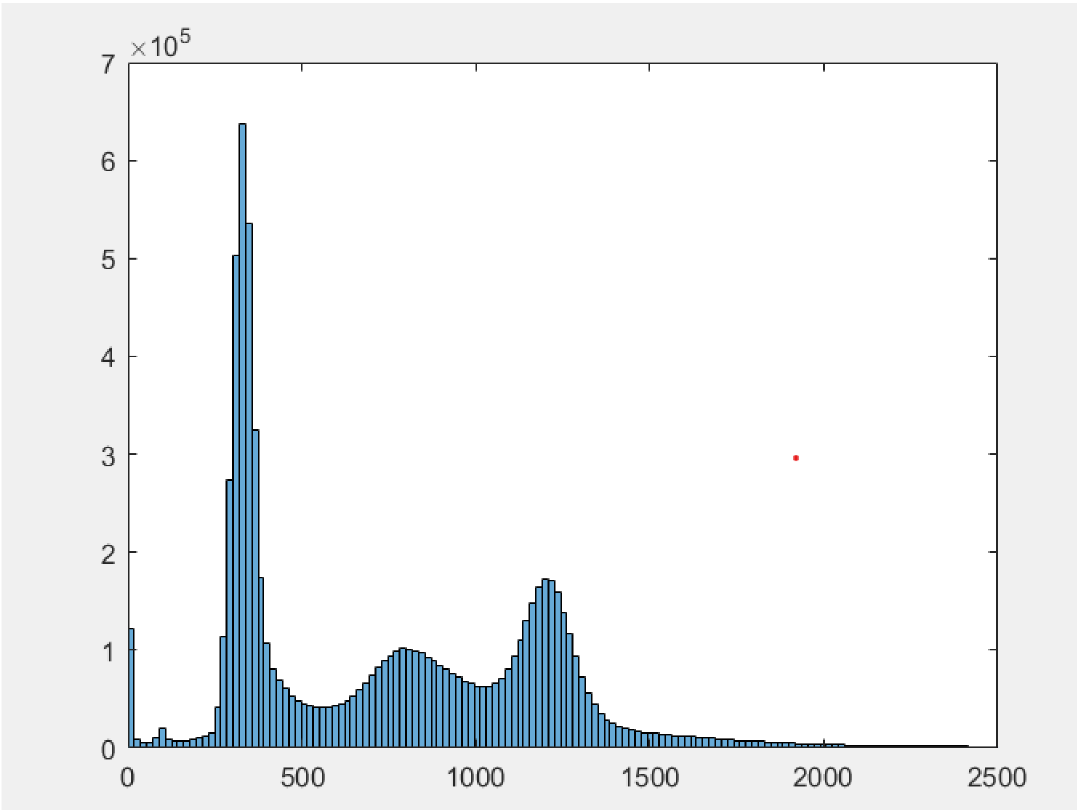
3(d)


0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
probability
0
500
1000
1500
2000
2500
image intensity

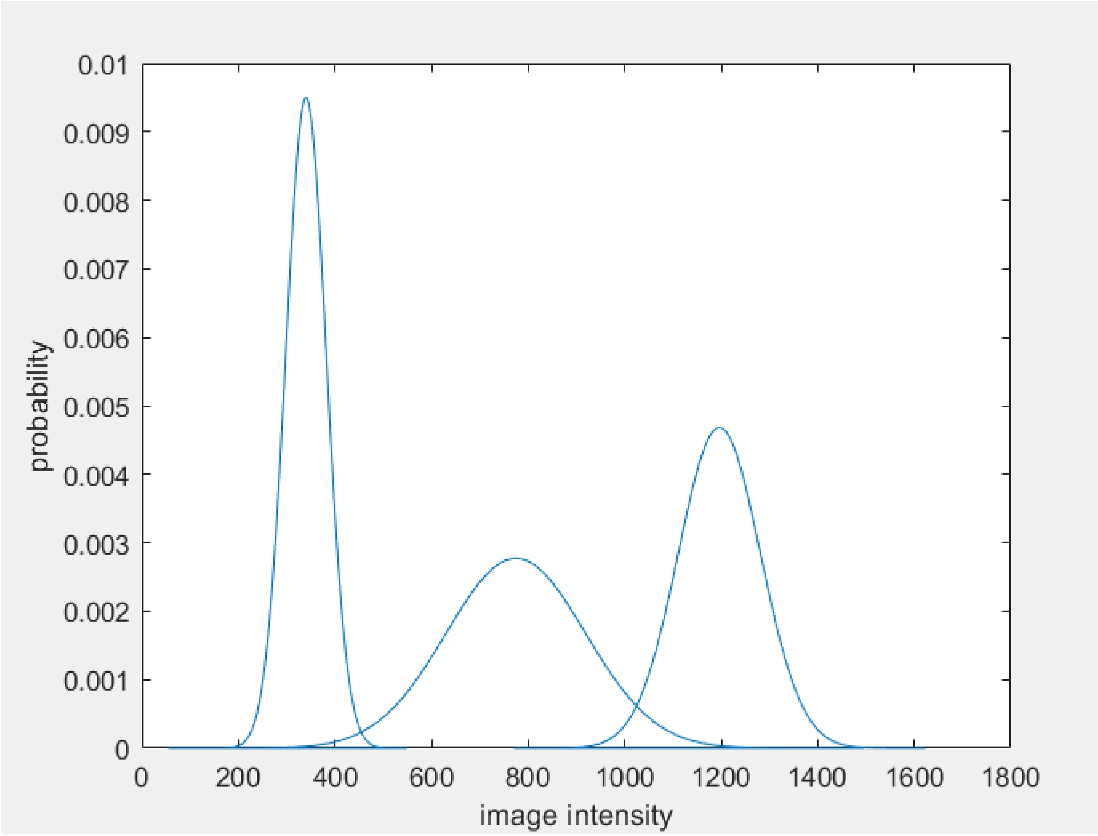

0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
probability
0
500
1000
1500
2000
2500
image intensity



0.01
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0
probability
0
500
1000
1500
2000
2500
image intensity



$\times 10^5$
7
6
5
4
3
2
1
0
0
500
1000
1500
2000
2500



they combined distribution looks similar to the histogram.