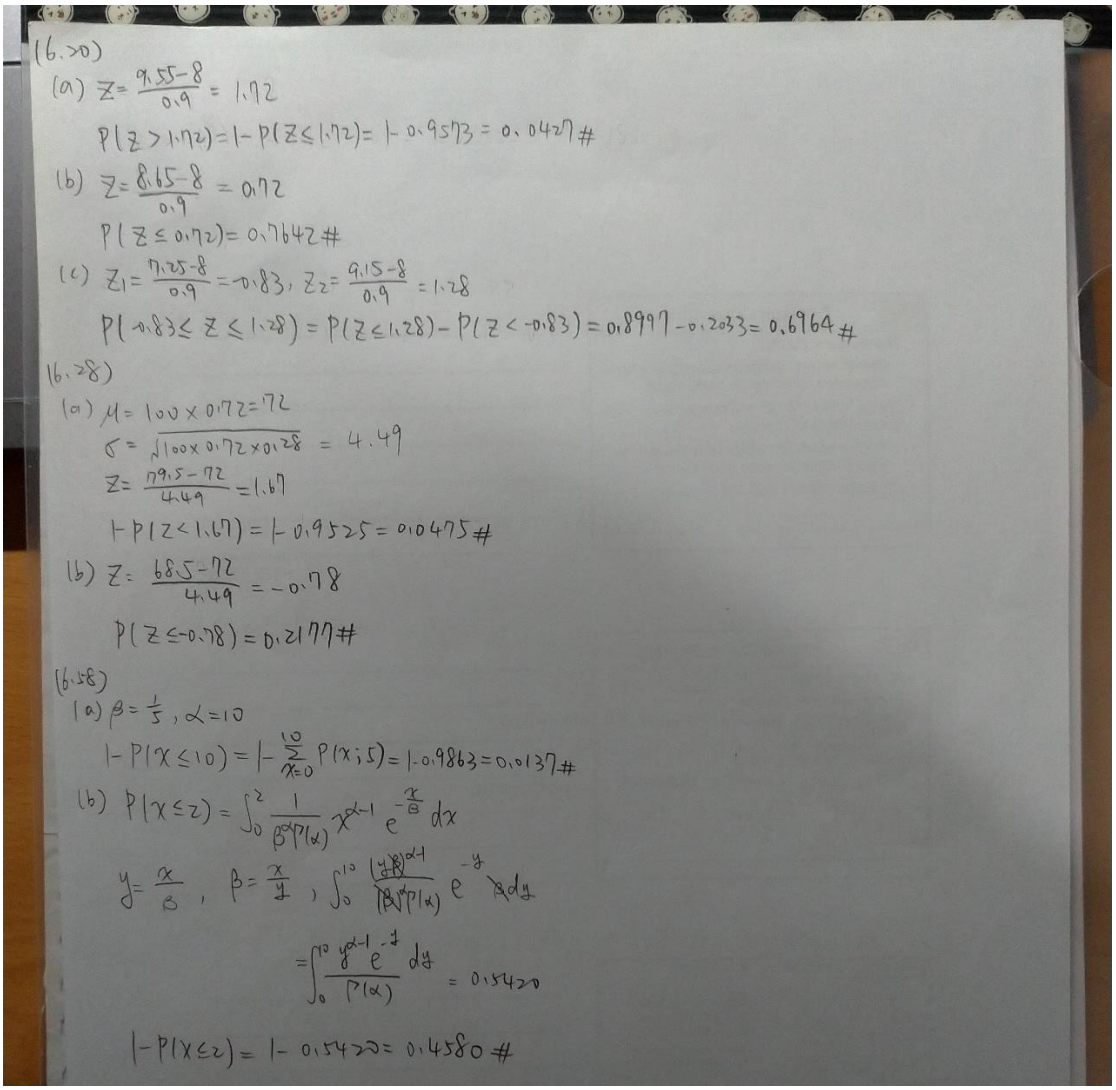


(6.20)

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

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

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

$P(Z \le 0.72) = 0.7642$ #

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

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

(6.28)

(a) $\mu = 100 \times 0.72 = 72$

$\sigma = \sqrt{100 \times 0.72 \times 0.28} = 4.49$

$Z = \frac{79.5-72}{4.49} = 1.67$

$1 - P(Z < 1.67) = 1 - 0.9525 = 0.0475$ #

(b) $Z = \frac{68.5-72}{4.49} = -0.78$

$P(Z \le -0.78) = 0.2177$ #

(6.58)

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

$1 - P(X \le 10) = 1 - \sum_{x=0}^{10} P(x; 5) = 1 - 0.9863 = 0.0137$ #

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

$y = \frac{x}{\beta}$, $\beta = \frac{x}{y}$, $\int_0^{10} \frac{(y\beta)^{\alpha-1}}{(\beta)^\alpha \Gamma(\alpha)} e^{-y} \beta dy$

$= \int_0^{10} \frac{y^{\alpha-1} e^{-y}}{\Gamma(\alpha)} dy = 0.5420$

$1 - P(X \le 2) = 1 - 0.5420 = 0.4580$ #

1.(a)

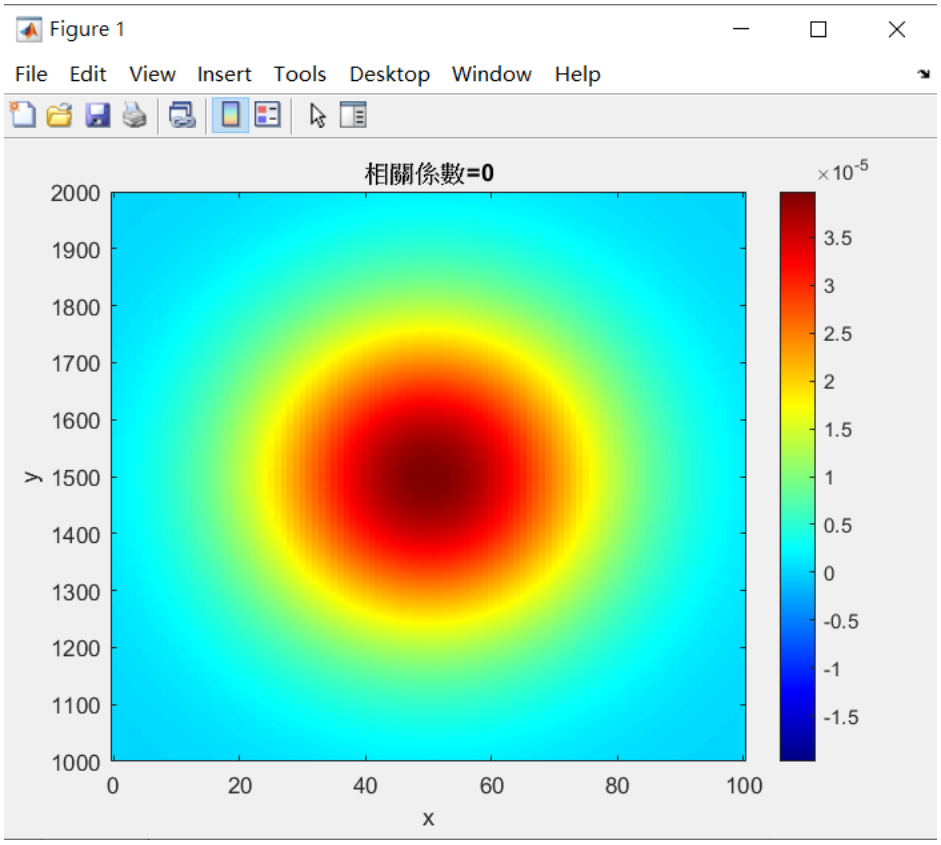


Figure 1
File Edit View Insert Tools Desktop Window Help
相關係數=0
×10-5
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
y
0
20
40
60
80
100
x

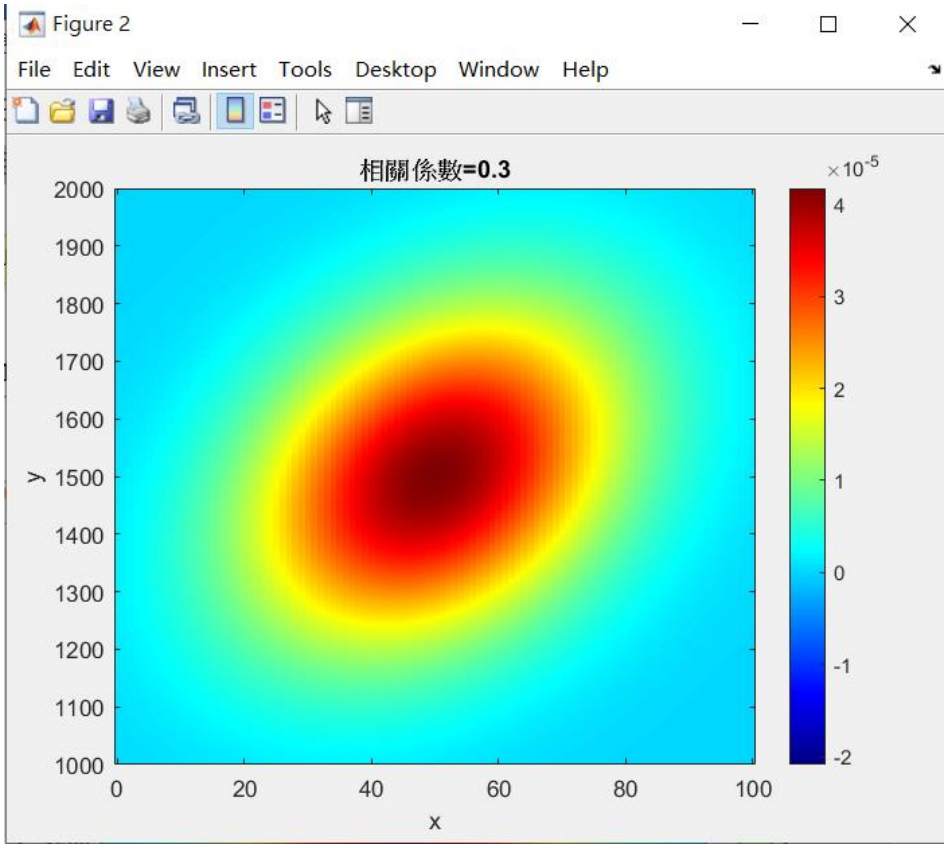
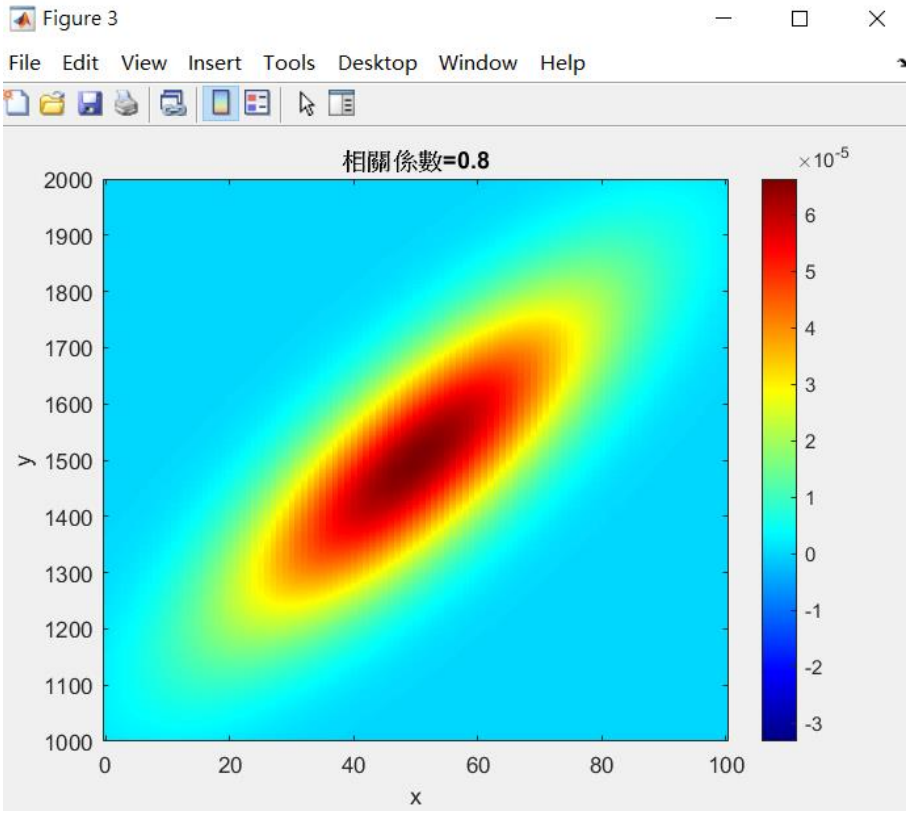
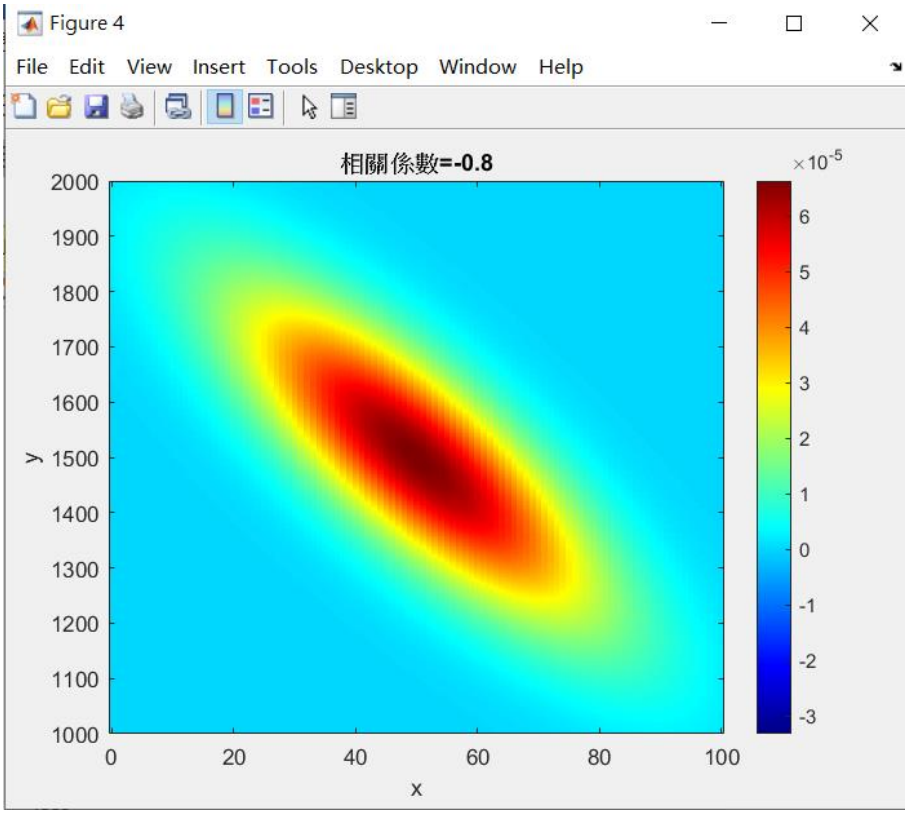


Figure 2
File Edit View Insert Tools Desktop Window Help
相關係數=0.3
×10-5
4
3
2
1
0
-1
-2
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
y
0
20
40
60
80
100
x





1.(b)

Distribution 1:圖形沒被拉扯

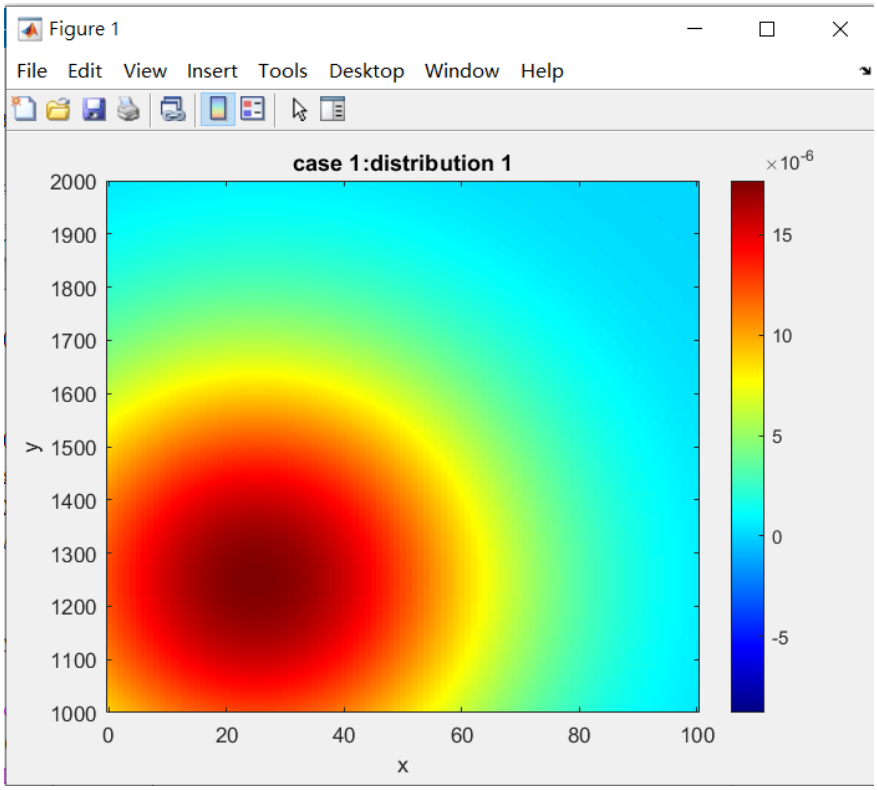
Distribution 2:圖形稍微被左下-右上拉扯

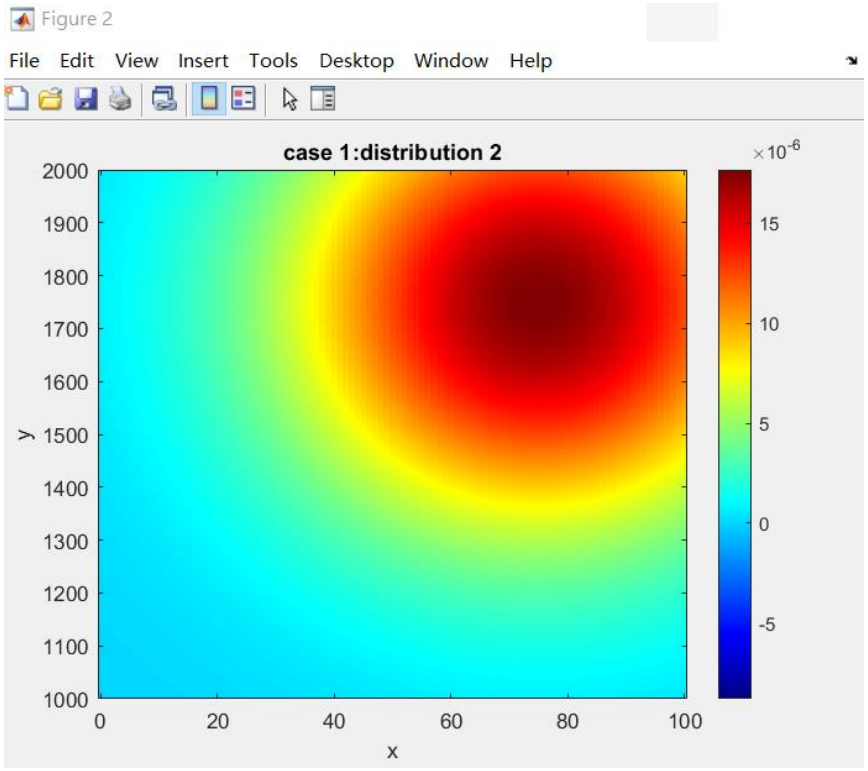
Distribution 3:圖形嚴重被左下-右上拉扯

Distribution 4:圖形嚴重被左上-右下拉扯

發現相關係數越大，圖形被拉扯越嚴重；且若相關係數為正，圖形拉扯方向為左下-右上，相關係數為負，圖形拉扯方向為左上-右下

2.(a)





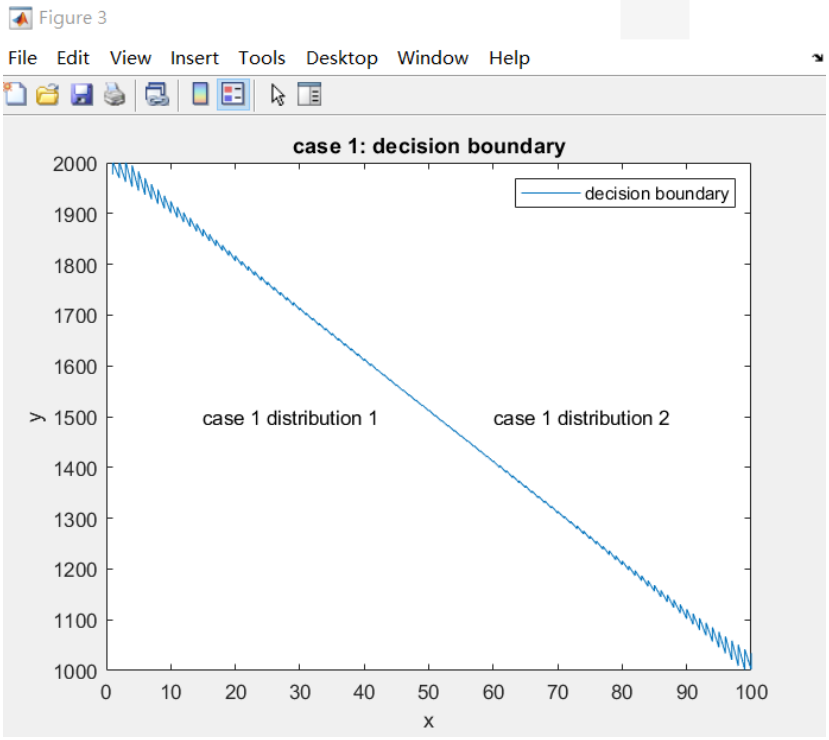


Figure 3
File Edit View Insert Tools Desktop Window Help
case 1: decision boundary
decision boundary
case 1 distribution 1
case 1 distribution 2
y
x
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
0 10 20 30 40 50 60 70 80 90 100

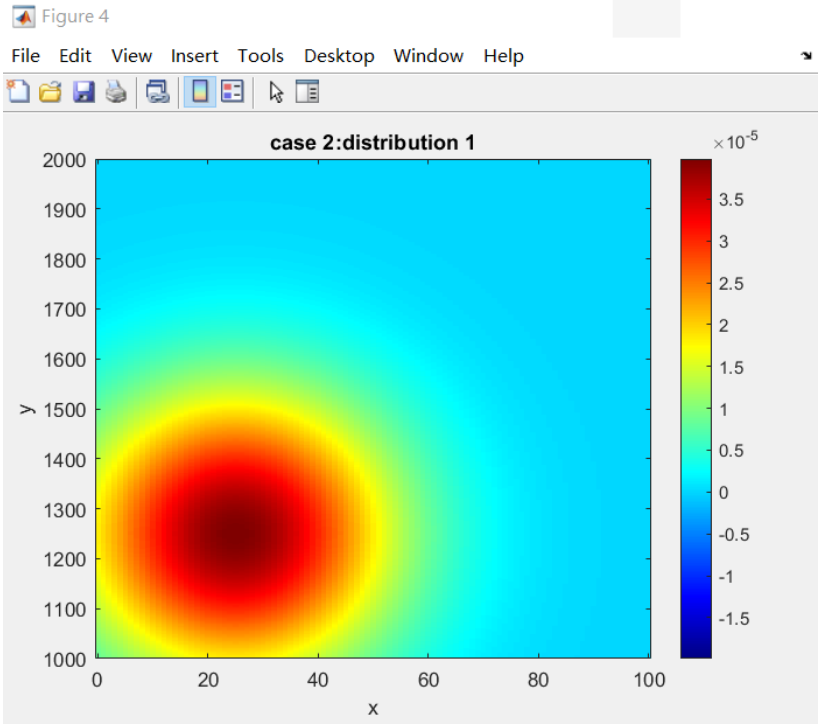
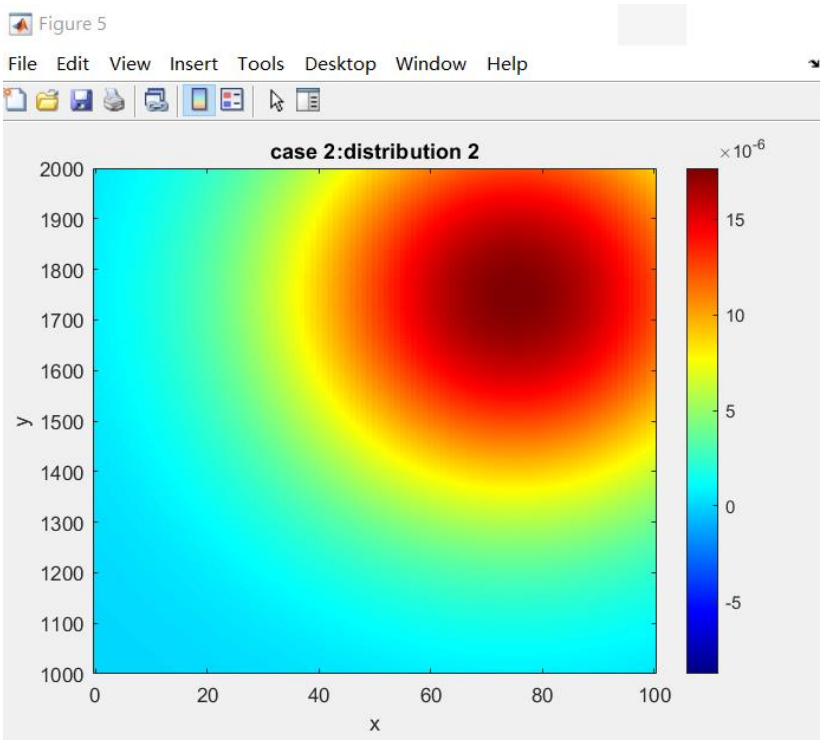
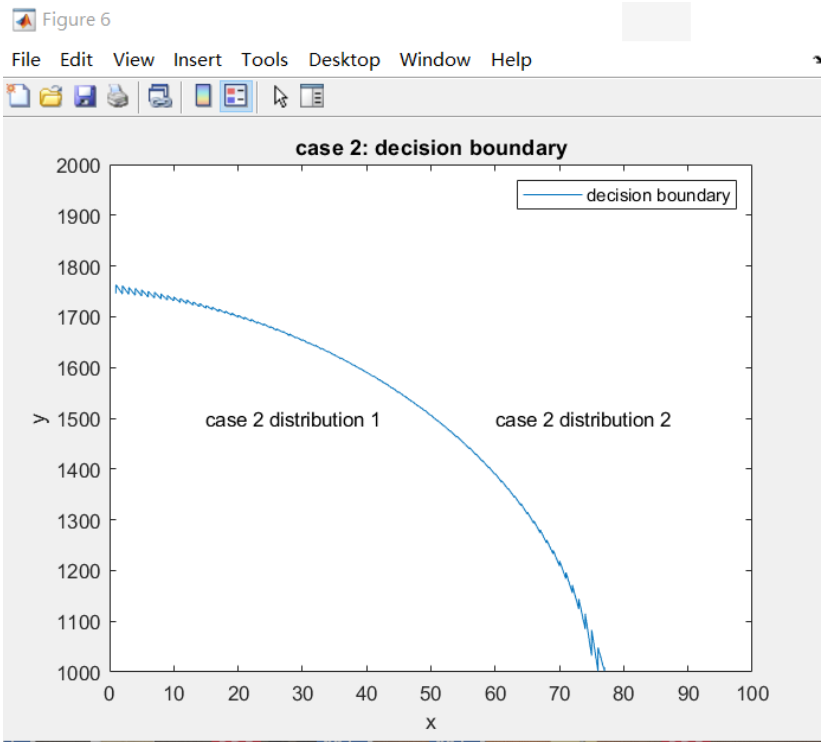


Figure 4
File Edit View Insert Tools Desktop Window Help
case 2:distribution 1
×10^-5
3.5
3
2.5
2
1.5
1
0.5
0
-0.5
-1
-1.5
y
x
2000
1900
1800
1700
1600
1500
1400
1300
1200
1100
1000
0 20 40 60 80 100





2.(b)

Case2 的 decision boundary 凹向點(0,1000)，case1 的 decision boundary 是斜直線，兩個 decision boundary 會不同的原因是因為 case2 的 distribution1 的 x,y 標準差比 case1 的 distribution1 的 x,y 標準差小，所以分布的範圍比較集中在平均值(25,1250)的位置，也就是資料比較集中，而兩個 case 的 distribution2 一樣，才會造成 decision doundary 凹向點(0,1000)。