

# Homework 6

*Luo Bingjun 2017013573 Software 71*

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## 11.4

**a.**

assign  $x$  to  $\pi_1$  if

$$\frac{f_1(x)}{f_2(x)} \geq \left(\frac{c(1|2)}{c(2|1)}\right)\left(\frac{p_2}{p_1}\right) = 0.5$$

assign  $x$  to  $\pi_2$  if

$$\frac{f_1(x)}{f_2(x)} < \left(\frac{c(1|2)}{c(2|1)}\right)\left(\frac{p_2}{p_1}\right) = 0.5$$

**b.**

$$\because \frac{f_1(x)}{f_2(x)} = 0.6 > 0.5$$

$\therefore$  assign  $x$  to  $\pi_1$

## 11.14

in (11-21)

$$\hat{a}^* = \frac{\hat{a}}{\sqrt{\hat{a}'\hat{a}}} = (0.7927, -0.609)'$$

$$m_1^* = \frac{1}{2}\hat{a}^*(\bar{x}_1 + \bar{x}_2) = -0.09709$$

Since  $\hat{y}_0^* = \hat{a}^*x_0 = -0.139671 < m_1^*$ , we classify  $x_0$  to  $\pi_2$ .

in (11-22)

$$\hat{a}^* = \frac{\hat{a}}{\hat{a}_1} = (1, -0.768)'$$

$$m_2^* = \frac{1}{2}\hat{a}^*(\bar{x}_1 + \bar{x}_2) = -0.12248$$

Since  $\hat{y}_0^* = \hat{a}^*x_0 = 0.17628 < m_2^*$ , we classify  $x_0$  to  $\pi_2$ .

The results are consistent with the classification in 11.3. They should be because there are only linear transformations which do not change the result.