Problem 7

Tuesday, June 11, 2024 5:35 PM

$\bar{X}_{Yes} = 10$ company = "Yes"

$\bar{X}_{No} = 0$ company = "No"

$\hat{\sigma}^2 = 36$ for Yes and No

80% issued dividents

X = normal distribution

predict Yes based on X=4

$\pi_{Yes} = .80$ since 80%

$\pi_{No} = .20$

Use LDA since $\sigma_1 = \sigma_k$ and normal

use density function 4.16 into 4.15 to get 4.17. Take the log for 4.18. Like we did in problem 2 and problem 3.

$$f_k(x) = \frac{1}{\sqrt{2(10)(36)}} e^{\left(-\frac{1}{2(36)^2}(4-10)^2\right)}$$

$$f_k(x) = \frac{1}{\sqrt{\pi}(36)} \cdot e^{\frac{-(x-10)^2}{3(36)}}$$

$$f_{Yes}(4) = ? \quad \frac{e^{-1/2}}{\sqrt{2\pi}}$$

$$Pr(Y=Yes \mid X=4) = \frac{\pi_{Yes} f_{Yes}}{\sum_{l=1}^{k} \pi_l F_l(4)}$$

$$= \frac{\pi_{Yes} f_{Yes}}{\pi_{No} f_{No}(4) + \pi_{Yes} f_{Yes}}$$

$$f_{No} = \frac{1}{\sqrt{2\pi}(36)} e^{\frac{-(x-0)^2}{2\sigma^2}} = \frac{e^{-2/9}}{\sqrt{72\pi}}$$

$$= .752$$ when you play it all in.

So 75.2 chance to return a divident