ISLR | Chapter 9 Exercises

Marshall McQuillen

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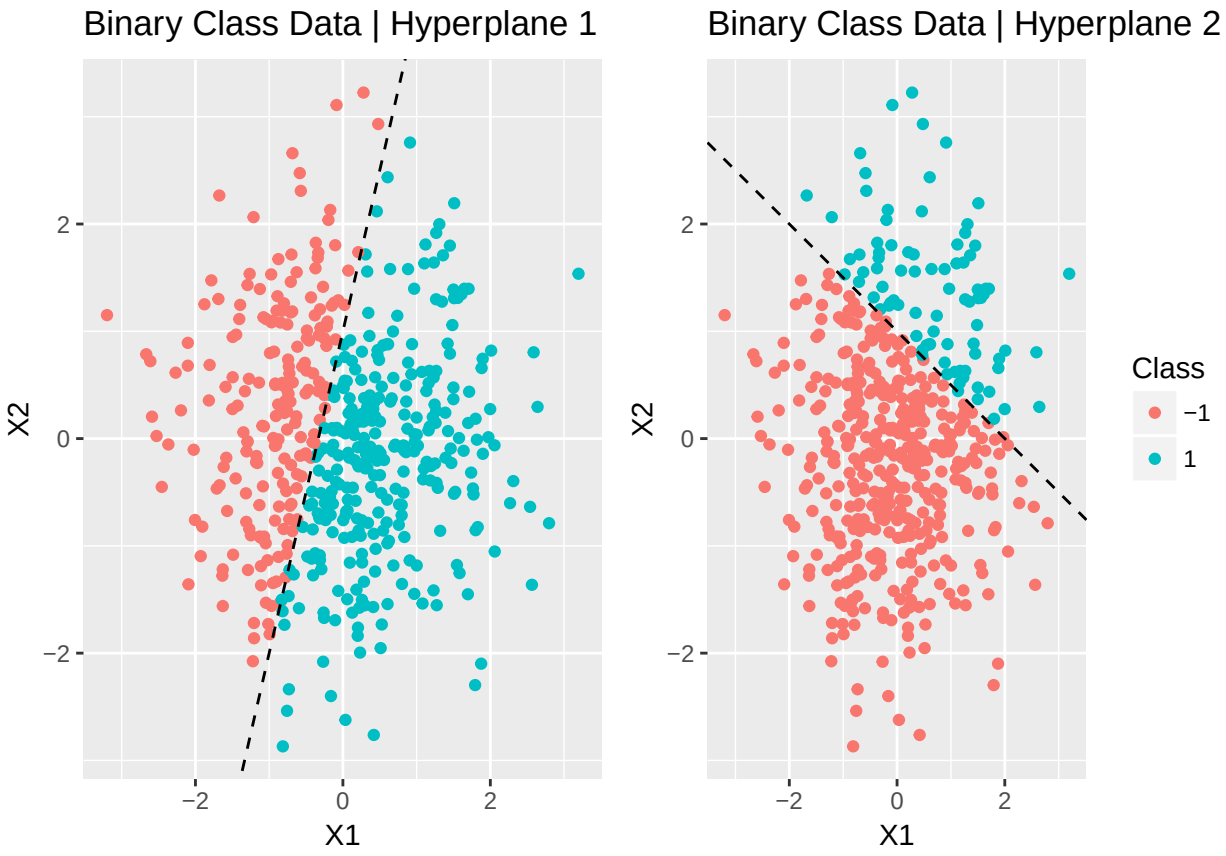
Conceptual

1

- **A & B.**

```
suppressPackageStartupMessages(library(gridExtra))
suppressPackageStartupMessages(library(ggplot2))

x <- matrix(rnorm(500*2), ncol = 2)

hyperplane1 <- 1 + 3*x[, 1] - x[, 2]
y <- ifelse(hyperplane1 > 0, 1, -1)

hyperplane2 <- -2 + x[, 1] + 2*x[, 2]
y2 <- ifelse(hyperplane2 > 0, 1, -1)

par(mfrow = c(1, 2))

plot1 <- ggplot(data.frame(x = x,
                  y = factor(y, levels = c(-1, 1))), aes(x.1, x.2, color=y)) +
             geom_point(show.legend = FALSE) +
             geom_abline(intercept = 1,
                         slope = 3,
                         linetype = 'dashed') +
             ggtitle("Binary Class Data | Hyperplane 1") +
             xlab("X1") +
             ylab("X2") +
             labs(color = "Class")

plot2 <- ggplot(data.frame(x = x,
                  y = factor(y2, levels = c(-1, 1))), aes(x.1, x.2, color=y)) +
             geom_point() +
             geom_abline(intercept = 1,
                         slope = -0.5,
                         linetype = 'dashed') +
             ggtitle("Binary Class Data | Hyperplane 2") +
             xlab("X1") +
             ylab("X2") +
             labs(color = "Class")

grid.arrange(plot1, plot2, ncol = 2)
```


Binary Class Data | Hyperplane 1
Binary Class Data | Hyperplane 2
X2
X1
2
0
−2
Class
−1
1