Assignment 10

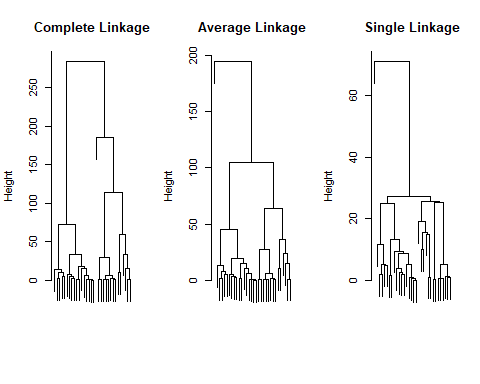
Abhishek Murthy

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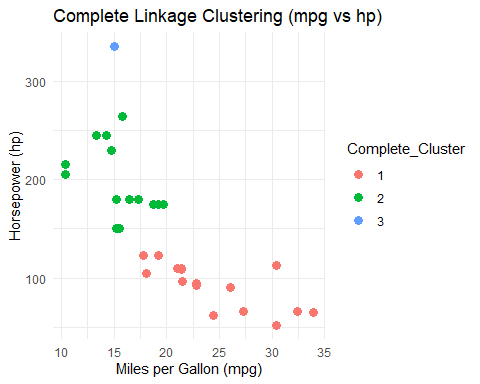
library(ggplot2)

## Warning: package 'ggplot2' was built under R version 4.3.3

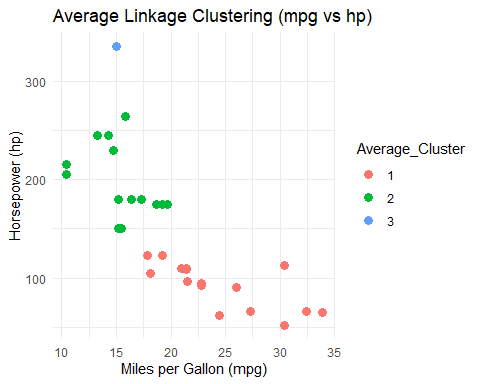
data <- mtcars[, c("mpg", "hp")]  
  
distance\_matrix <- dist(data, method = "euclidean")  
  
hclust\_complete <- hclust(distance\_matrix, method = "complete")  
hclust\_average <- hclust(distance\_matrix, method = "average")  
hclust\_single <- hclust(distance\_matrix, method = "single")  
  
par(mfrow = c(1, 3))  
  
plot(hclust\_complete, main = "Complete Linkage", xlab = "", ylab = "Height", sub = "", labels = FALSE)  
plot(hclust\_average, main = "Average Linkage", xlab = "", ylab = "Height", sub = "", labels = FALSE)  
plot(hclust\_single, main = "Single Linkage", xlab = "", ylab = "Height", sub = "", labels = FALSE)



par(mfrow = c(1, 1))  
  
clusters\_complete <- cutree(hclust\_complete, k = 3)  
clusters\_average <- cutree(hclust\_average, k = 3)  
clusters\_single <- cutree(hclust\_single, k = 3)  
  
data$Complete\_Cluster <- as.factor(clusters\_complete)  
data$Average\_Cluster <- as.factor(clusters\_average)  
data$Single\_Cluster <- as.factor(clusters\_single)  
  
ggplot(data, aes(x = mpg, y = hp, color = Complete\_Cluster)) +  
 geom\_point(size = 3) +  
 labs(title = "Complete Linkage Clustering (mpg vs hp)", x = "Miles per Gallon (mpg)", y = "Horsepower (hp)") +  
 theme\_minimal()



ggplot(data, aes(x = mpg, y = hp, color = Average\_Cluster)) +  
 geom\_point(size = 3) +  
 labs(title = "Average Linkage Clustering (mpg vs hp)", x = "Miles per Gallon (mpg)", y = "Horsepower (hp)") +  
 theme\_minimal()



ggplot(data, aes(x = mpg, y = hp, color = Single\_Cluster)) +  
 geom\_point(size = 3) +  
 labs(title = "Single Linkage Clustering (mpg vs hp)", x = "Miles per Gallon (mpg)", y = "Horsepower (hp)") +  
 theme\_minimal()

