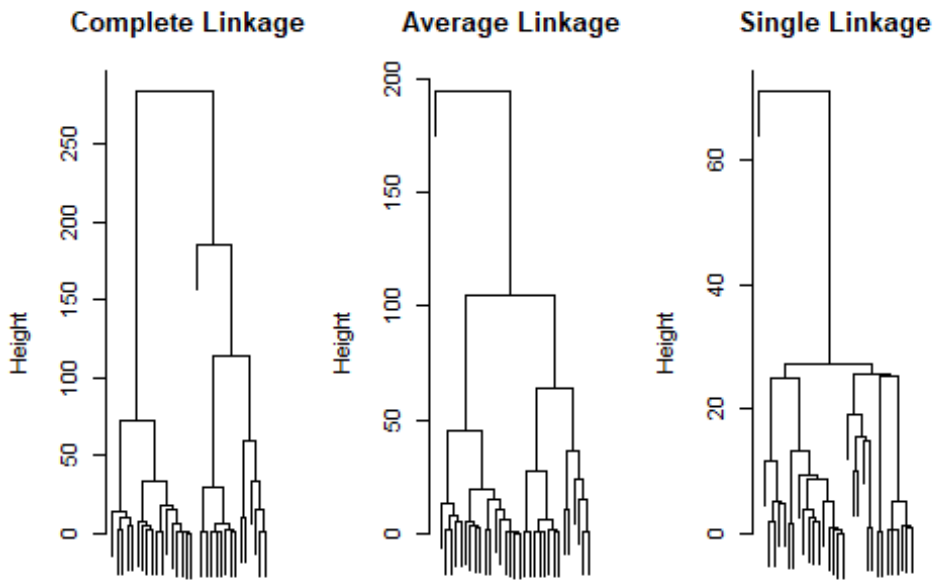
Assignment 10

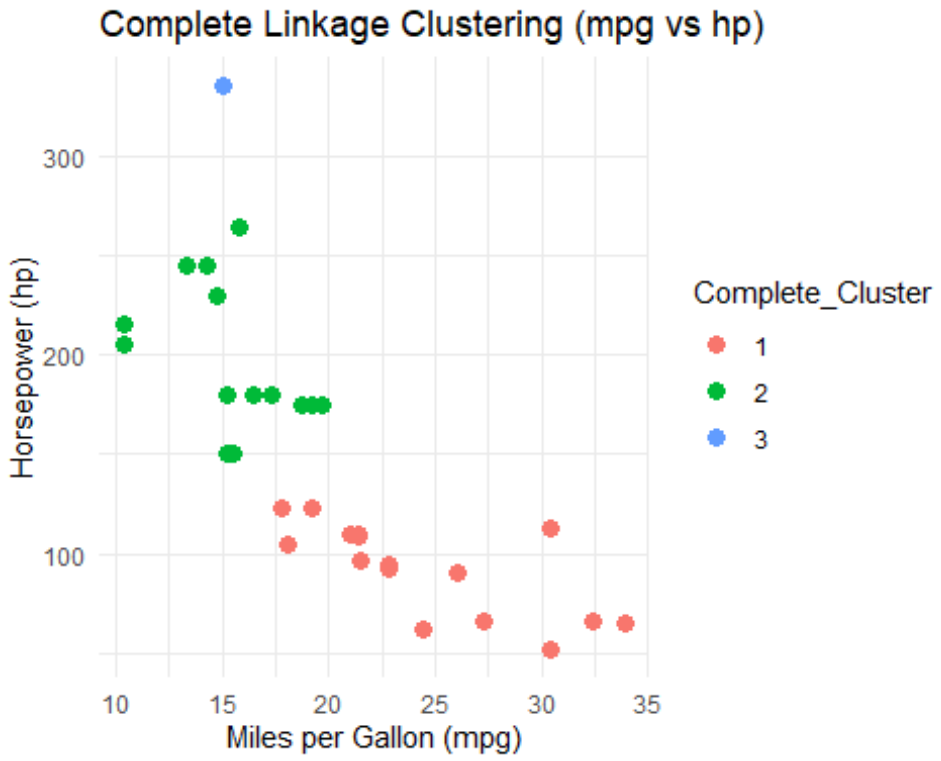
Abhishek Murthy

2024-10-11

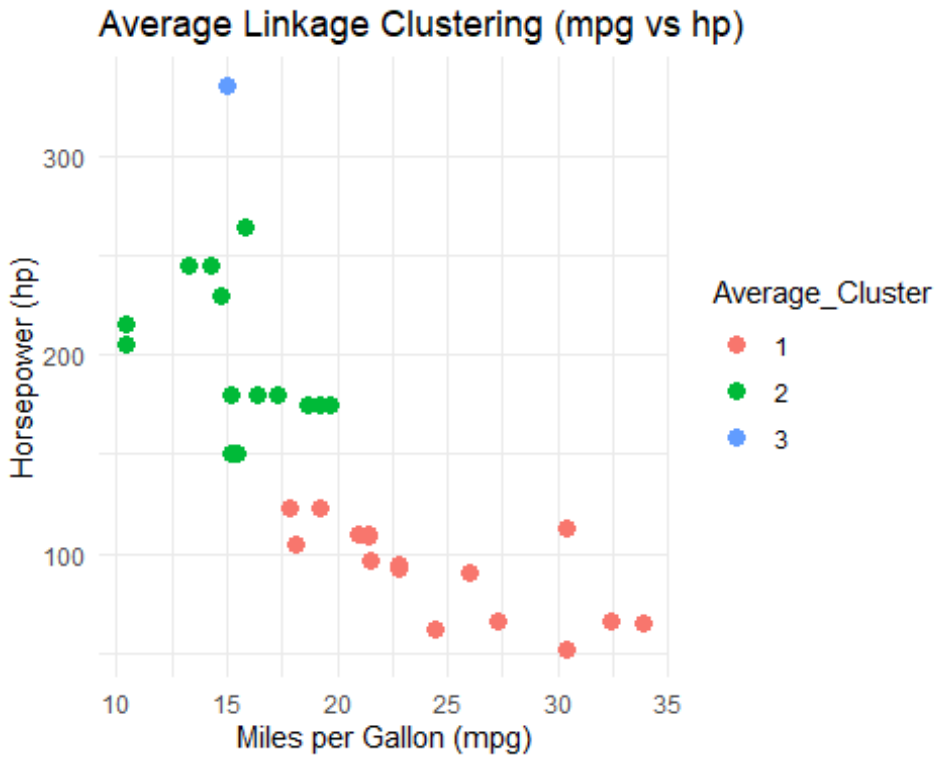
```
library(ggplot2)

## 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)
```



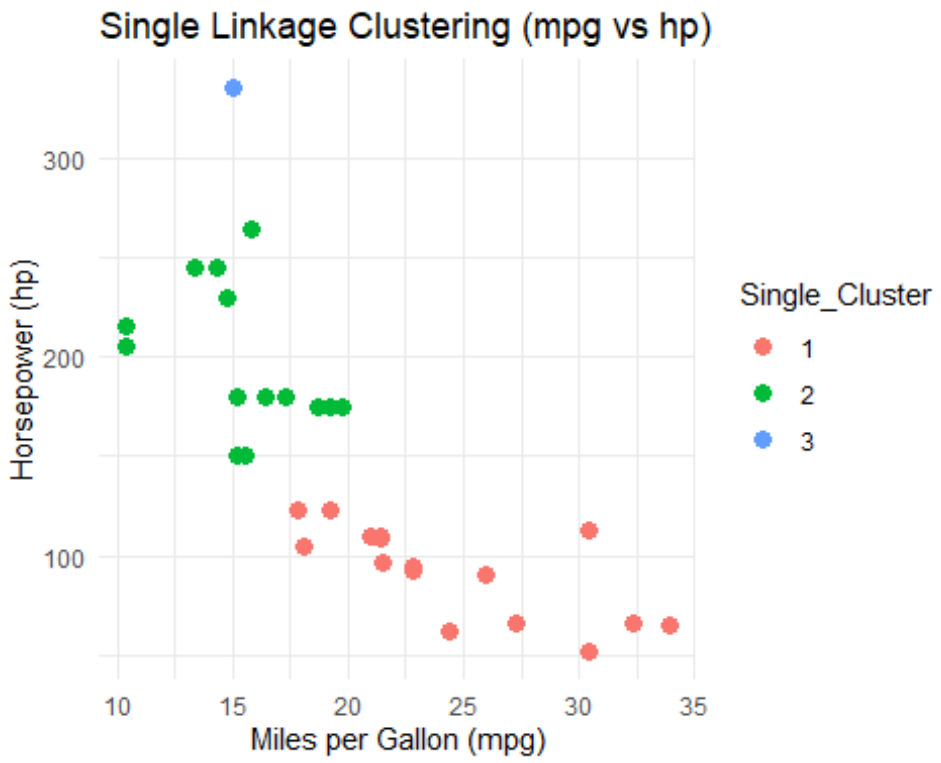

```r
par(mfrow = c(1, 1))

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()
```




```r
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()
```




```r
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()
```


Single Linkage Clustering (mpg vs hp)
Horsepower (hp)
300
200
100
10
15
20
25
30
35
Miles per Gallon (mpg)
Single_Cluster
1
2
3