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data(mtcars)

# Summary statistics
summary(mtcars)

# Correlation matrix for all numeric variables
cor_matrix <- cor(mtcars)
print(round(cor_matrix, 2))

# Visualize correlation matrix with heatmap for full dataset
heatmap(cor_matrix, main = "Correlation heatmap of mtcars variables", col = heat.colors(256))

library(ggplot2)
library(reshape2)

# Function to plot heatmap for a given data frame subset
plot_heatmap <- function(data_subset, title) {
  data_subset$car <- rownames(data_subset)
  melted <- melt(data_subset, id.vars = "car")

  ggplot(melted, aes(x = variable, y = car, fill = value)) +
    geom_tile() +
    scale_fill_gradient(low = "white", high = "blue") +
    labs(title = title, x = "Features", y = "Cars") +
    theme_minimal() +
    theme(axis.text.x = element_text(angle = 45, hjust = 1))
}

# Engine performance features
engine_perf <- mtcars[, c("mpg", "hp", "wt", "qsec")]
plot_heatmap(engine_perf, "Heatmap of Engine Performance Features")

# Transmission & performance features
trans_perf <- mtcars[, c("am", "gear", "carb", "hp")]
plot_heatmap(trans_perf, "Heatmap of Transmission & Performance Features")

# Dimensions & efficiency features
dim_eff <- mtcars[, c("dis", "drat", "wt", "mpg")]
plot_heatmap(dim_eff, "Heatmap of Dimensions & Efficiency Features")

# Cluster based on engine performance features
dist_mat <- dist(scale(engine_perf))
hc <- hclust(dist_mat)

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# Plot heatmap with clustering order
engine_perf_ordered <- engine_perf[hc$order, ]
plot_heatmap(engine_perf_ordered, "Heatmap of Engine Performance Features (Clustered)")
```