

Clustering Assignment

```
data <- data.frame(  
  ID = 1:10,  
  Height = c(5.1, 5.5, 5.8, 6.0, 5.4, 5.7, 6.1, 5.3, 5.9, 5.6),  
  Weight = c(130, 150, 160, 180, 145, 155, 170, 140, 165, 158)  
)
```

```
print("Dataframe:")  
print(data)
```

```
k <- 2  
centroids <- data.frame(  
  Height = c(5.2, 5.8),  
  Weight = c(135, 165)  
)  
print("Initial Centroids:")  
print(centroids)
```

#Euclidean distance

```
euclidean_distance <- function(x1, y1, x2, y2) {  
  sqrt((x1 - x2)^2 + (y1 - y2)^2)  
}
```

Assign clusters

```
assign_clusters <- function(data, centroids) {  
  clusters <- numeric(nrow(data))  
  for (i in 1:nrow(data)) {  
    distances <- numeric(nrow(centroids))  
    for (j in 1:nrow(centroids)) {  
      distances[j] <- euclidean_distance(data$Height[i], data$Weight[i], centroids$Height[j],  
centroids$Weight[j])  
    }  
    clusters[i] <- which.min(distances)  
  }  
  return(clusters)  
}  
data$Cluster <- assign_clusters(data, centroids)  
print("Data with Assigned Clusters:")  
print(data)
```

#Visualization

```
colors <- c("red", "blue")  
plot(data$Height, data$Weight, col = colors[data$Cluster], pch = 19,  
      xlab = "Height", ylab = "Weight", main = "K-means Clustering")  
points(centroids$Height, centroids$Weight, col = "black", pch = 8, cex = 2)
```