# Student marks dataset (sorted)

marks <- c(55, 60, 71, 63, 55, 65, 50, 55, 58, 59, 61, 63, 65, 67, 71, 72, 75)

# ✅ (a) Equal-Frequency Partitioning (Each bin gets same number of values)

bin\_size <- length(marks) / 3 # Number of elements per bin

bins\_eq\_freq <- split(marks, cut(rank(marks), breaks = 3, labels = FALSE))

# ✅ (b) Equal-Width Partitioning (Bins have equal value ranges)

bin\_width <- (max(marks) - min(marks)) / 3 # Bin width

bins\_eq\_width <- cut(marks, breaks = seq(min(marks), max(marks), by = bin\_width), include.lowest = TRUE)

# ✅ (c) Clustering using K-Means

set.seed(123) # For consistent results

kmeans\_result <- kmeans(marks, centers = 3) # 3 clusters

marks\_clustered <- data.frame(marks, cluster = kmeans\_result$cluster)

# 📊 Plot Histogram of Student Marks

hist(marks,

breaks = 6,

col = "skyblue",

main = "Histogram of Student Marks",

xlab = "Marks",

ylab = "Frequency",

border = "black")

# 📌 Print Binning Results

print("Equal-Frequency Binning:")

print(bins\_eq\_freq)

print("Equal-Width Binning:")

print(table(bins\_eq\_width))

print("K-Means Clustering Result:")

print(marks\_clustered)