**4. NORMALIZATION**

# Given data

data <- c(200, 300, 400, 600, 1000)

# (a) Min-Max Normalization (min=0, max=1)

min\_val <- min(data)

max\_val <- max(data)

min\_max\_norm <- (data - min\_val) / (max\_val - min\_val)

# (b) Z-Score Normalization

mean\_val <- mean(data)

std\_dev <- sd(data)

z\_score\_norm <- (data - mean\_val) / std\_dev

# (c) Z-Score Normalization using Mean Absolute Deviation (MAD)

mad\_val <- mean(abs(data - mean\_val))

z\_score\_mad\_norm <- (data - mean\_val) / mad\_val

# (d) Normalization by Decimal Scaling

max\_abs <- max(abs(data))

scaling\_factor <- 10^ceiling(log10(max\_abs))

decimal\_scaling\_norm <- data / scaling\_factor

# Print results

print("Min-Max Normalization:")

print(min\_max\_norm)

print("Z-Score Normalization:")

print(z\_score\_norm)

print("Z-Score Normalization using MAD:")

print(z\_score\_mad\_norm)

print("Normalization by Decimal Scaling:")

print(decimal\_scaling\_norm)