**INPUT:**

# Load data

Tree\_NO <- 1:10

Actual\_Weight <- c(59, 47, 52, 60, 67, 48, 44, 58, 76, 58)

Estimated\_Weight <- c(61, 42, 50, 58, 67, 45, 39, 57, 71, 53)

# Calculate population total of estimated weights

x\_total <- 1160

# Create data frame

df <- data.frame(Tree\_NO, Actual\_Weight, Estimated\_Weight)

# Fit regression model

model <- lm(Actual\_Weight ~ Estimated\_Weight, data = df)

# Summary of regression model

summary(model)

# Predict population total

N <- 200

y\_hat <- (coef(model)[1] + coef(model)[2] \* (x\_total / N)) \* N

# Calculate standard error of estimated total

SE\_y\_hat <- sqrt((N^2 \* (N - length(Actual\_Weight)) / (length(Actual\_Weight) \* (N - 1))) \* summary(model)$sigma^2)

# Print results

cat("Estimated Population Total:", y\_hat, "\n")

cat("Standard Error (S.E):", SE\_y\_hat, "\n"

**OUTPUT:**

> summary(model)

Call:

lm(formula = Actual\_Weight ~ Estimated\_Weight, data = df)

Residuals:

Min 1Q Median 3Q Max

-3.9234 -1.2466 -0.3828 1.0821 4.0866

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 8.08386 4.10872 1.967 0.0847 .

Estimated\_Weight 0.89901 0.07442 12.081 2.04e-06 \*\*\*

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Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 2.351 on 8 degrees of freedom

Multiple R-squared: 0.948, Adjusted R-squared: 0.9415

F-statistic: 145.9 on 1 and 8 DF, p-value: 2.037e-06

**> cat("Estimated Population Total:", y\_hat, "\n")**

Estimated Population Total: 2659.621

**> cat("Standard Error (S.E):", SE\_y\_hat, "\n")**

Standard Error (S.E): 145.293