

**Exp No: 7**

## **Implement Linear and Logistic Regression**

### **a)Linear regression**

```
# Sample data
heights <- c(150, 160, 165, 170, 175, 180, 185)
weights <- c(55, 60, 62, 68, 70, 75, 80)

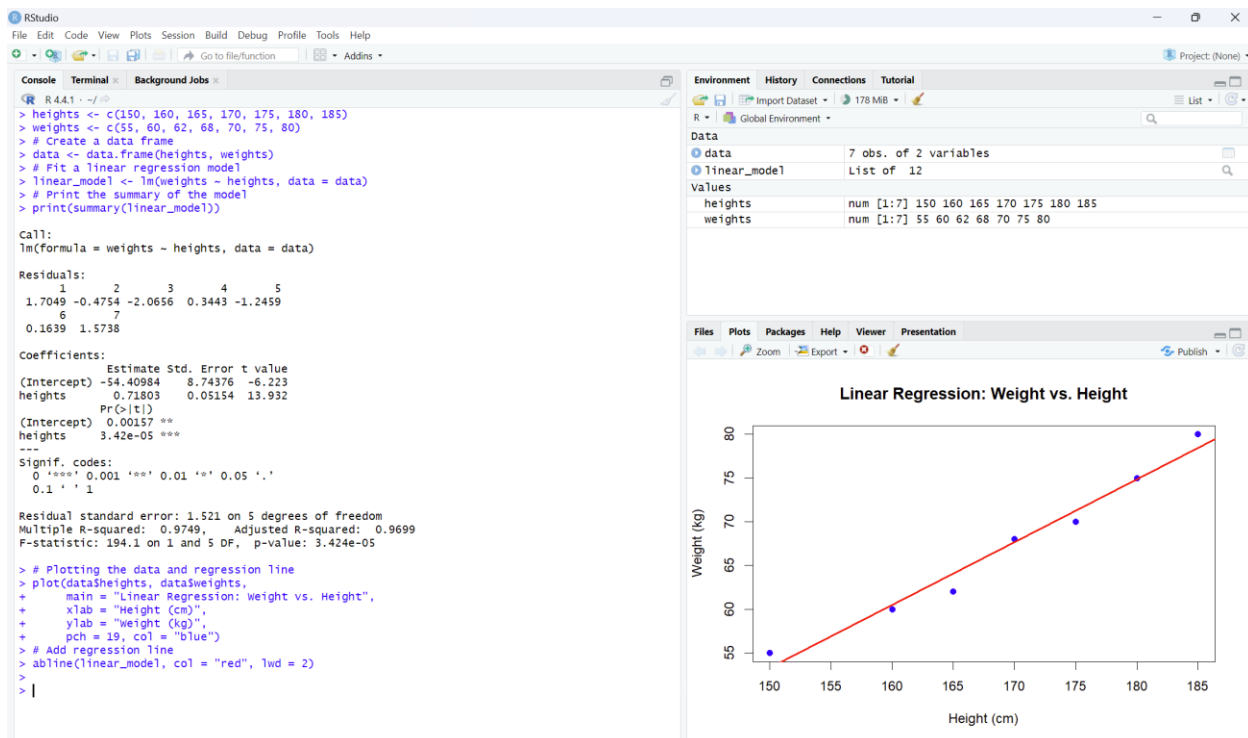
# Create a data frame
data <- data.frame(heights, weights)

# Fit a linear regression model
linear_model <- lm(weights ~ heights, data = data)

# Print the summary of the model
print(summary(linear_model))

# Plotting the data and regression line
plot(data$heights, data$weights,
     main = "Linear Regression: Weight vs. Height",
     xlab = "Height (cm)",
     ylab = "Weight (kg)",
     pch = 19, col = "blue")

# Add regression line
abline(linear_model, col = "red", lwd = 2)
```



## b) Logistic regression

# Load the dataset

```
data(mtcars)
```

# Convert 'am' to a factor (categorical variable)

```
mtcars$am <- factor(mtcars$am, levels = c(0, 1), labels = c("Automatic", "Manual"))
```

# Fit a logistic regression model

```
logistic_model <- glm(am ~ mpg, data = mtcars, family = binomial)
```

# Print the summary of the model

```
print(summary(logistic_model))
```

# Predict probabilities for the logistic model

```
predicted_probs <- predict(logistic_model, type = "response")
```

# Display the predicted probabilities

```
print(predicted_probs)
```

# Plotting the data and logistic regression curve

```
plot(mtcars$mpg, as.numeric(mtcars$am) - 1,
     main = "Logistic Regression: Transmission vs. MPG",
     xlab = "Miles Per Gallon (mpg)",
```

```
ylab = "Probability of Manual Transmission",
```

```
pch = 19, col = "blue")
```

```
# Add the logistic regression curve
```

```
curve(predict(logistic_model, data.frame(mpg = x), type = "response"),
```

```
add = TRUE, col = "red", lwd = 2)
```

