

**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",
```

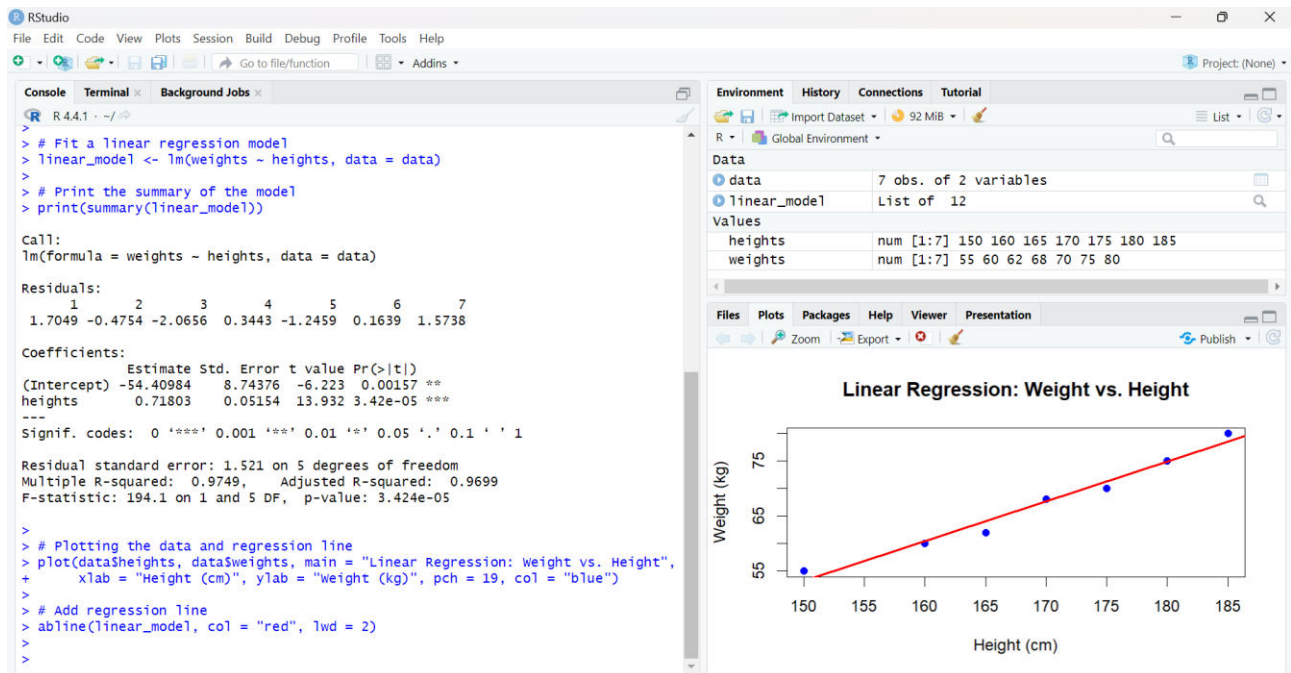
```
  xlab = "Height (cm)",
```

```
  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)

```

