

Exp:7

Implement Linear and Logistic Regressiona

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

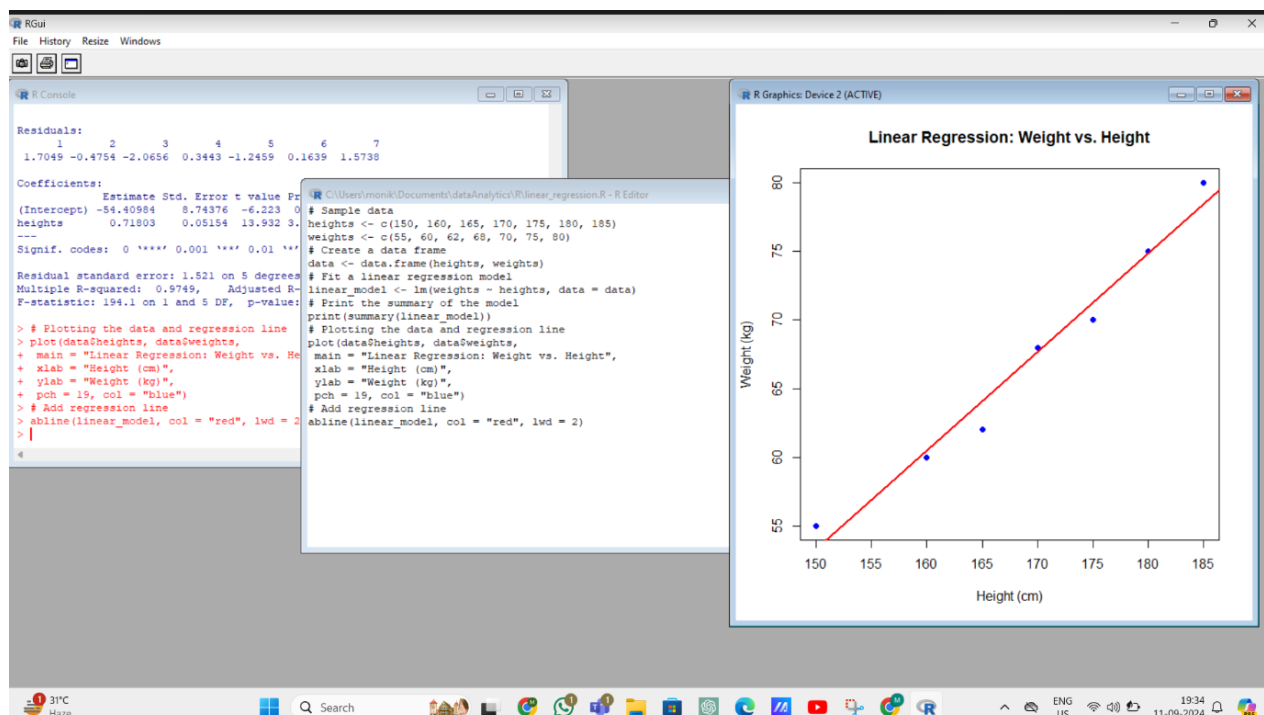
```
print(summary(linear_model))
```

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)
```

