EXP.NO.: 06	Perform bivariate and multivariate analysis on the dataset

AIM

To perform bivariate and multivariate analysis on the *iris* dataset and to study correlations, scatterplots, and group comparisons using MANOVA.

TOOLS REQUIRED

- RStudio IDE
- R programming language
- Built-in dataset: iris
- Statistical functions in R

ALGORITHM

- Load the iris dataset and select numerical variables.
- Perform **correlation analysis** for bivariate relationships.
- Plot **scatterplots** for variable comparisons.
- Generate **multivariate scatterplot matrix**.
- Conduct **MANOVA** to check group differences among species.

CODING

```
data(iris)
df <- iris[, -5]

cor_matrix <- cor(df)
print(cor_matrix)
plot(df$Sepal.Length, df$Petal.Length, col=iris$Species,
    main="Bivariate Analysis", xlab="Sepal Length", ylab="Petal Length")


pairs(df, col=iris$Species, main="Multivariate Scatterplot Matrix")


fit <- manova(cbind(Sepal.Length, Sepal.Width, Petal.Length, Petal.Width) ~ Species, data=iris)
summary(fit)
```

OUTPUT


```
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df <- iris[, -5]

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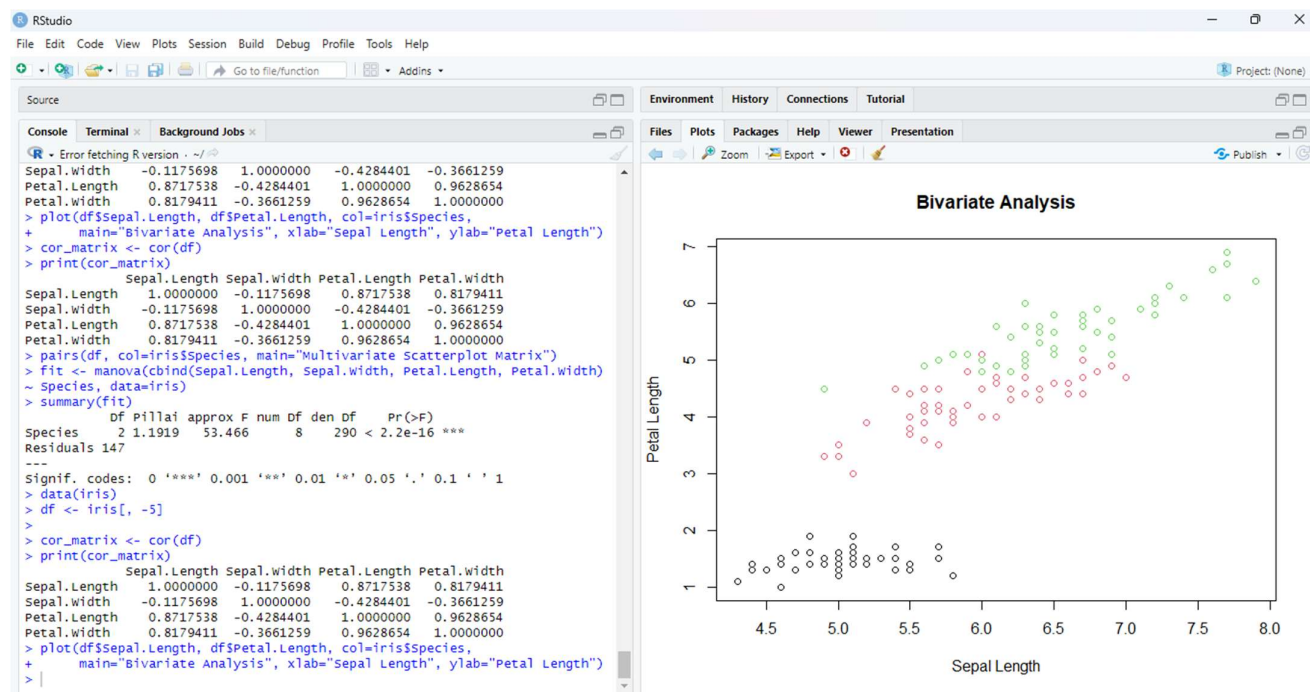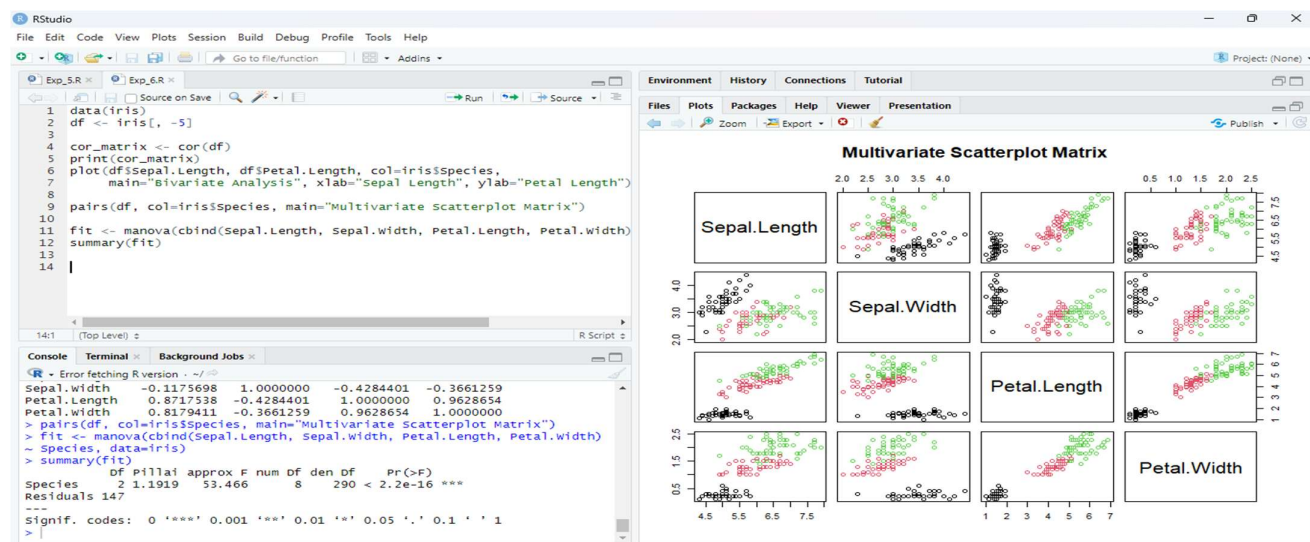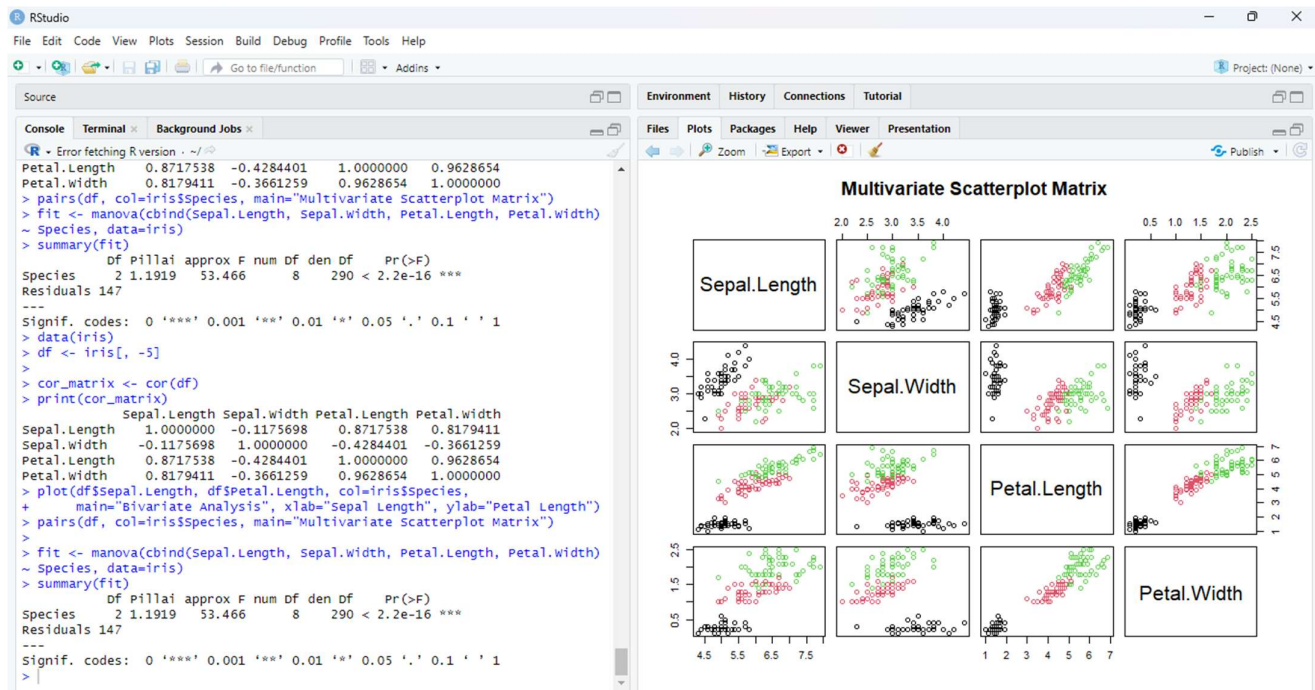
```
Sepal.Width    -0.1175698    1.0000000    -0.4284401    -0.3661259
Petal.Length    0.8717538   -0.4284401     1.0000000     0.9628654
Petal.Width     0.8179411   -0.3661259     0.9628654     1.0000000
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> summary(fit)
          Df Pillai approx F num Df den Df    Pr(>F)
Species    2 1.1919   53.466      8    290 < 2.2e-16 ***
Residuals 147
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
> |
```



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RESULT

Thus successfully completed bivariate and multivariate analysis on the *iris* dataset.The study showed clear correlations and confirmed species differences through MANOVA.