11 .Make use of correlogram to visualize data in correlation matrices for iris dataset.

Aim: To analyze relationships among variables using correlation visualization techniques.

- To generate and interpret correlograms for the **iris** dataset.

```
# Install necessary packages if not already installed
install.packages("corrplot")

install.packages("ggplot2")

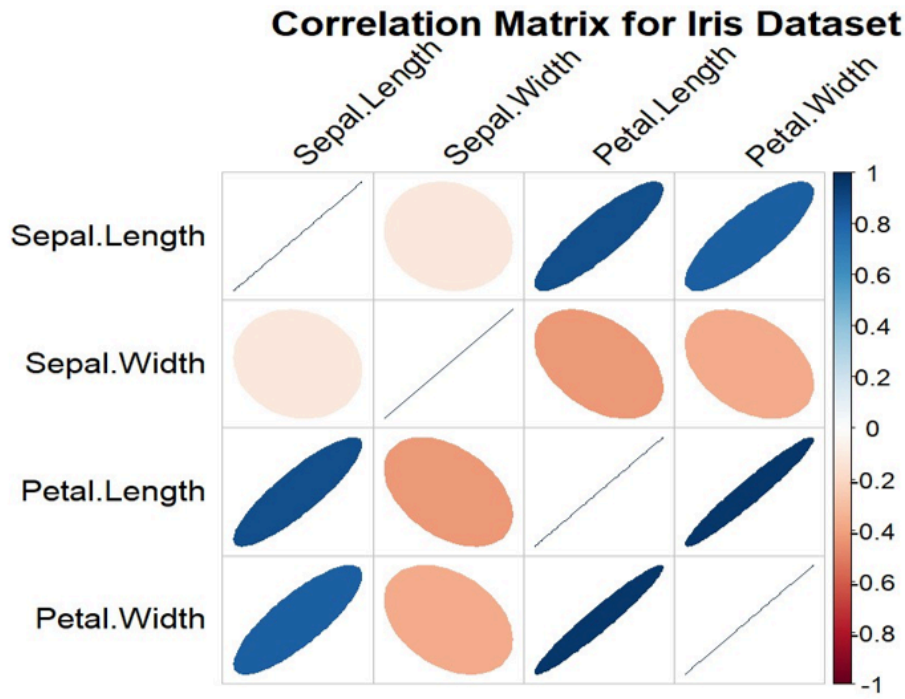

# Load libraries
library(corrplot)
library(ggplot2)

# Load the iris dataset
data(iris)

# Select only the numeric columns for correlation
iris_numeric<-iris[,1:4]

# Calculate the correlation matrix
cor_matrix<-cor(iris_numeric)


# Plot the correlogram
corrplot(cor_matrix,method="ellipse",type="full",
        tl.col="black",tl.srt=45,
        title="Correlation Matrix for Iris Dataset",
        mar=c(0,0,1,0))
```



You can write the following interpretation in your practical record:

The correlation matrix is visualized using the `corrplot()` function with the circle method.

Blue ellipses indicate positive correlations, while orange ellipses indicate negative correlations.

The size and shape of each ellipse represent the strength and direction of the relationship.

The diagonal represents perfect self-correlation.

The strongest positive correlation is observed between Petal Length and Petal Width, with a coefficient of approximately 0.963.

The weakest relationship is between Sepal Length and Sepal Width, with a coefficient of approximately -0.118.

Thus, the correlogram helps identify strong, weak, positive, and negative relationships among numerical variables in the Iris dataset.

Viva Questions and Answers

1. What is a correlogram?

A graphical representation of correlation coefficients.

2. What is correlation?

Statistical association between variables.

3. Types of correlation?

Positive, negative, and zero correlation.

4. Range of correlation coefficient?

-1 to +1.

5. What does +1 indicate?

Perfect positive correlation.

6. What does -1 indicate?

Perfect negative correlation.

7. Which package is commonly used?

corrplot.

8. How are positive and negative correlations represented?

Using different colors and symbol sizes.

9. Why are correlograms useful in feature selection?

They help identify redundant variables.

10. What is multicollinearity?

A situation where independent variables are highly correlated.