Laxmi Charitable Trust's

Sheth L.U.J College of Arts & Sir M.V. College of Science and Commerce

Department of Information Technology (B.Sc.I.T Semester IV)

Data Analysis with SAS/SPSS/R

Practical VI

(Performing two-way ANOVA using aov() (R).)

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Class: SYIT	Batch: 1
Date of Assignment: 17/01/2026	Date/Time of Submission: 17/01/2026

Code:

```
library(readxl)
# Read dataset
iris <- read_excel("C:/Users/IT-23/Downloads/iris.xlsx")
# View data
View(iris)

# Create categorical variable from Sepal Length
iris$Sepal_Length_Group <- cut(
  iris$sepal.length,
  breaks = 3,
  labels = c("Short", "Medium", "Long")
)

# Create contingency table
table_sl_variety <- table(iris$Sepal_Length_Group, iris$variety)

# Chi-square test
chisq.test(table_sl_variety)
```

Output:

```
> # Create categorical variable from Sepal Length
> iris$Sepal_Length_Group <- cut(
+   iris$sepal.length,
+   breaks = 3,
+   labels = c("Short", "Medium", "Long")
+ )
>
> # Create contingency table
> table_sl_variety <- table(iris$Sepal_Length_Group, iris$variety)
>
> # Chi-square test
> chisq.test(table_sl_variety)

        Pearson's Chi-squared test

data:  table_sl_variety
X-squared = 111.63, df = 4, p-value < 2.2e-16
```

Hypothesis

Null Hypothesis (H_0):
Sepal length group and flower variety are independent of each other.

Alternative Hypothesis (H_1):
Sepal length group and flower variety are dependent on each other.

Decision Rule

- If **p-value < 0.05**, reject H_0
- If **p-value ≥ 0.05**, accept H_0

Decision

From the Chi-Square test output, the **p-value is less than 0.05**.
Therefore, the null hypothesis is **rejected**.

Conclusion

Since the p-value obtained from the Chi-Square test is less than the level of significance (0.05), it is concluded that **sepal length group and flower variety are significantly associated**.
Thus, the flower variety depends on the sepal length group.