**23BCE9360 – C N S SWAROOP**

**LAB – L57/L58**

# FDA LAB ASSIGNMENT - 4

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FDA LAB ASSIGNMENT - 4

**Q1: Iris Flowers Description This famous (Fisher or Anderson) iris data set gives the measurements in**

**centimetres of the variables sepal length and width and petal length and width, respectively, for 50**

**flowers from each of 3 species of iris. The species are Iris setosa, versicolor, and virginica.**

Open iris data set in R and do the following

Print the dataset iris

Print the structure of the dataset iris

Print the summary of all the variables of the dataset iris (Hint: Use function summary())

How many of the variables (columns) are in the dataset iris

How many observations (rows) are in the dataset iris

Print last 3 rows without using tail() function

Print the elements of 3rd column

Print all the elements of 2nd row

Print all the elements of 2nd, 5th and 13th row

Print all odd indexed rows (rows 1,3,5,...) (Hint: Use function - seq)

Print first three columns

Print the elements of columns from 5 to 10

Print the elements of columns from 3 to 7, 9 and 11

Print the elements of rows from 15 to 20

Print First, Second Row and Second and Third Column

Print element at 2nd row, third column

Print all the rows having " Sepal.Width " value greater than 1.4

Print all the rows having " Sepal.Width " value less than 2.5

Sort the observations of the dataset “iris” in incresing order based on the values in the column

"Sepal.Width"

Sort the observations of the dataset “iris” by column “Sepal.Width” in increasing order and column

“Petal.Width” in decreasing order

Use duplicated() function to print the logical vector indicating the duplicate values present in the

dataset iris

Extract duplicate elements from the dataset iris

Extract unique elements from the dataset iris

Print the indices of duplicate elements in the dataset iris

Print the indices of unique elements in the dataset iris

How many unique elements are in the dataset iris

How many duplicate elements are in the dataset iris

## CODE:

```
#  Load dataset
data(iris)

# 1. Print the dataset
print(iris)

# 2. Print the structure of the dataset
str(iris)

# 3. Print summary of all variables
summary(iris)

# 4. Number of variables (columns)
num_cols <- ncol(iris)
print(num_cols)

# 5. Number of observations (rows)
num_rows <- nrow(iris)
print(num_rows)

# 6. Print last 3 rows without using tail() function
print(iris[(nrow(iris) - 2):nrow(iris), ])

# 7. Print elements of 3rd column
print(iris[, 3])

# 8. Print all elements of 2nd row
print(iris[2, ])

# 9. Print all elements of 2nd, 5th, and 13th row
print(iris[c(2, 5, 13), ])

# 10. Print all odd indexed rows
print(iris[seq(1, nrow(iris), 2), ])

# 11. Print first three columns
print(iris[, 1:3])

# 12. Print elements of columns from 5 to 10 (iris has only 5 columns, so this
will show only the 5th column)
print(iris[, 5, drop=FALSE])

# 13. Print elements of columns from 3 to 7, 9, and 11 (iris has only 5
columns, so it cannot extract beyond 5)
print(iris[, 3:5, drop=FALSE])

# 14. Print elements of rows from 15 to 20
print(iris[15:20, ])
```

```
# 15. Print First and Second Row, and Second and Third Column
print(iris[1:2, 2:3])

# 16. Print element at 2nd row, 3rd column
print(iris[2, 3])

# 17. Print all rows where "Sepal.Width" is greater than 1.4
print(iris[iris$Sepal.Width > 1.4, ])

# 18. Print all rows where "Sepal.Width" is less than 2.5
print(iris[iris$Sepal.Width < 2.5, ])

# 19. Sort dataset by "Sepal.Width" in increasing order
print(iris[order(iris$Sepal.Width), ])

# 20. Sort dataset by "Sepal.Width" (ascending) and "Petal.Width"
(descending)
print(iris[order(iris$Sepal.Width, -iris$Petal.Width), ])

# 21. Use duplicated() to print logical vector for duplicate values
print(duplicated(iris))

# 22. Extract duplicate elements
print(iris[duplicated(iris), ])

# 23. Extract unique elements
print(unique(iris))

# 24. Print indices of duplicate elements
print(which(duplicated(iris)))

# 25. Print indices of unique elements
print(which(!duplicated(iris)))

# 26. Count unique elements
num_unique <- nrow(unique(iris))
print(num_unique)

# 27. Count duplicate elements
num_duplicates <- nrow(iris) - num_unique
print(num_duplicates)
```

OUTPUT:

| | Sepal.Length | Sepal.Width | Petal.Length | Petal.Width | Species |
|---|---|---|---|---|---|
| 1 | 5.1 | 3.5 | 1.4 | 0.2 | setosa |
| 2 | 4.9 | 3.0 | 1.4 | 0.2 | setosa |
| 3 | 4.7 | 3.2 | 1.3 | 0.2 | setosa |
| 4 | 4.6 | 3.1 | 1.5 | 0.2 | setosa |
| 5 | 5.0 | 3.6 | 1.4 | 0.2 | setosa |
| 6 | 5.4 | 3.9 | 1.7 | 0.4 | setosa |
| 7 | 4.6 | 3.4 | 1.4 | 0.3 | setosa |
| 8 | 5.0 | 3.4 | 1.5 | 0.2 | setosa |
| 9 | 4.4 | 2.9 | 1.4 | 0.2 | setosa |
| 10 | 4.9 | 3.1 | 1.5 | 0.1 | setosa |
| 11 | 5.4 | 3.7 | 1.5 | 0.2 | setosa |
| 12 | 4.8 | 3.4 | 1.6 | 0.2 | setosa |
| 13 | 4.8 | 3.0 | 1.4 | 0.1 | setosa |
| 14 | 4.3 | 3.0 | 1.1 | 0.1 | setosa |
| 15 | 5.8 | 4.0 | 1.2 | 0.2 | setosa |
| 16 | 5.7 | 4.4 | 1.5 | 0.4 | setosa |
| 17 | 5.4 | 3.9 | 1.3 | 0.4 | setosa |
| 18 | 5.1 | 3.5 | 1.4 | 0.3 | setosa |
| 19 | 5.7 | 3.8 | 1.7 | 0.3 | setosa |
| 20 | 5.1 | 3.8 | 1.5 | 0.3 | setosa |
| 21 | 5.4 | 3.4 | 1.7 | 0.2 | setosa |
| 22 | 5.1 | 3.7 | 1.5 | 0.4 | setosa |
| 23 | 4.6 | 3.6 | 1.0 | 0.2 | setosa |
| 24 | 5.1 | 3.3 | 1.7 | 0.5 | setosa |
| 25 | 4.8 | 3.4 | 1.9 | 0.2 | setosa |
| 26 | 5.0 | 3.0 | 1.6 | 0.2 | setosa |
| 27 | 5.0 | 3.4 | 1.6 | 0.4 | setosa |
| 28 | 5.2 | 3.5 | 1.5 | 0.2 | setosa |
| 29 | 5.2 | 3.4 | 1.4 | 0.2 | setosa |
| 30 | 4.7 | 3.2 | 1.6 | 0.2 | setosa |
| 31 | 4.8 | 3.1 | 1.6 | 0.2 | setosa |
| 32 | 5.4 | 3.4 | 1.5 | 0.4 | setosa |
| 33 | 5.2 | 4.1 | 1.5 | 0.1 | setosa |
| 34 | 5.5 | 4.2 | 1.4 | 0.2 | setosa |
| 35 | 4.9 | 3.1 | 1.5 | 0.2 | setosa |
| 36 | 5.0 | 3.2 | 1.2 | 0.2 | setosa |
| 37 | 5.5 | 3.5 | 1.3 | 0.2 | setosa |
| 38 | 4.9 | 3.6 | 1.4 | 0.1 | setosa |
| 39 | 4.4 | 3.0 | 1.3 | 0.2 | setosa |
| 40 | 5.1 | 3.4 | 1.5 | 0.2 | setosa |
| 41 | 5.0 | 3.5 | 1.3 | 0.3 | setosa |
| 42 | 4.5 | 2.3 | 1.3 | 0.3 | setosa |
| 43 | 4.4 | 3.2 | 1.3 | 0.2 | setosa |
| 44 | 5.0 | 3.5 | 1.6 | 0.6 | setosa |
| 45 | 5.1 | 3.8 | 1.9 | 0.4 | setosa |
| 46 | 4.8 | 3.0 | 1.4 | 0.3 | setosa |
| 47 | 5.1 | 3.8 | 1.6 | 0.2 | setosa |
| 48 | 4.6 | 3.2 | 1.4 | 0.2 | setosa |
| 49 | 5.3 | 3.7 | 1.5 | 0.2 | setosa |
| 50 | 5.0 | 3.3 | 1.4 | 0.2 | setosa |
| 51 | 7.0 | 3.2 | 4.7 | 1.4 | versicolor |
| 52 | 6.4 | 3.2 | 4.5 | 1.5 | versicolor |
| 53 | 6.9 | 3.1 | 4.9 | 1.5 | versicolor |
| 54 | 5.5 | 2.3 | 4.0 | 1.3 | versicolor |
| 55 | 6.5 | 2.8 | 4.6 | 1.5 | versicolor |
| 56 | 5.7 | 2.8 | 4.5 | 1.3 | versicolor |
| 57 | 6.3 | 3.3 | 4.7 | 1.6 | versicolor |
| 58 | 4.9 | 2.4 | 3.3 | 1.0 | versicolor |
| 59 | 6.6 | 2.9 | 4.6 | 1.3 | versicolor |
| 60 | 5.2 | 2.7 | 3.9 | 1.4 | versicolor |
| 61 | 5.0 | 2.0 | 3.5 | 1.0 | versicolor |
| 62 | 5.9 | 3.0 | 4.2 | 1.5 | versicolor |
| 63 | 6.0 | 2.2 | 4.0 | 1.0 | versicolor |
| 64 | 6.1 | 2.9 | 4.7 | 1.4 | versicolor |
| 65 | 5.6 | 2.9 | 3.6 | 1.3 | versicolor |
| 66 | 6.7 | 3.1 | 4.4 | 1.4 | versicolor |
| 67 | 5.6 | 3.0 | 4.5 | 1.5 | versicolor |
| 68 | 5.8 | 2.7 | 4.1 | 1.0 | versicolor |

```
'data.frame':   150 obs. of  5 variables:
 $ Sepal.Length: num  5.1 4.9 4.7 4.6 5 5.4 4.6 5 4.4 4.9 ...
 $ Sepal.Width : num  3.5 3 3.2 3.1 3.6 3.9 3.4 3.4 2.9 3.1 ...
 $ Petal.Length: num  1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 ...
 $ Petal.Width : num  0.2 0.2 0.2 0.2 0.2 0.4 0.3 0.2 0.2 0.1 ...
 $ Species     : Factor w/ 3 levels "setosa","versicolor",..: 1 1 1 1 1 1 1 1 1 1 ...
  Sepal.Length    Sepal.Width     Petal.Length    Petal.Width
 Min.   :4.300   Min.   :2.000   Min.   :1.000   Min.   :0.100
 1st Qu.:5.100   1st Qu.:2.800   1st Qu.:1.600   1st Qu.:0.300
 Median :5.800   Median :3.000   Median :4.350   Median :1.300
 Mean   :5.843   Mean   :3.057   Mean   :3.758   Mean   :1.199
 3rd Qu.:6.400   3rd Qu.:3.300   3rd Qu.:5.100   3rd Qu.:1.800
 Max.   :7.900   Max.   :4.400   Max.   :6.900   Max.   :2.500
       Species
 setosa    :50
 versicolor:50
 virginica :50



[1] 5
[1] 150
    Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
148          6.5         3.0          5.2         2.0 virginica
149          6.2         3.4          5.4         2.3 virginica
150          5.9         3.0          5.1         1.8 virginica
  [1] 1.4 1.4 1.3 1.5 1.4 1.7 1.4 1.5 1.4 1.5 1.5 1.6 1.4 1.1 1.2 1.5 1.3 1.4
 [19] 1.7 1.5 1.7 1.5 1.0 1.7 1.9 1.6 1.6 1.5 1.4 1.6 1.6 1.5 1.5 1.4 1.5 1.2
 [37] 1.3 1.4 1.3 1.5 1.3 1.3 1.3 1.6 1.9 1.4 1.6 1.4 1.5 1.4 4.7 4.5 4.9 4.0
 [55] 4.6 4.5 4.7 3.3 4.6 3.9 3.5 4.2 4.0 4.7 3.6 4.4 4.5

=== Execution Halted ===
```