**Report on Basic Calculations, Variables, Vectors, and Iris Dataset Analysis in R**

**Basic Calculations**

The following basic calculations were performed in R:

1. Addition:

R

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> 1 + 2

[1] 3

1. Division:

R

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> (100 + 30) / 13

[1] 10

1. Exponentiation and addition:

R

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> 3^4 + 2^4

[1] 97

1. Addition and multiplication:

R

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> 1 + 2 \* 3

[1] 7

These calculations demonstrate basic arithmetic operations in R, including addition, division, exponentiation, and the order of operations.

**Variables**

Variables x and y were assigned values and used in various operations:

1. Assigning and squaring a variable:

R

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> x <- 1 + 3

> x \* x

[1] 16

1. Multiplying x by 2:

R

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> x \* 2

[1] 8

1. Addition of x and y:

R

Copy code

> y <- 2 + 1

> y + x

[1] 7

1. Multiplication and subtraction of x and y:

R

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> x \* y

[1] 12

> x - y

[1] 1

These steps show basic variable operations and arithmetic between variables.

**Vectors and Vector Calculations**

Vectors x1 and x2 were created and analyzed:

1. Vector addition:

R

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> x1 <- c(1, 2, 3, 4, 5)

> x2 <- c(1, 3, 5, 7, 9)

> x1 + x2

[1] 2 5 8 11 14

1. Element-wise multiplication:

R

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> x1 \* x2

[1] 1 6 15 28 45

1. Summary statistics for x1:
   * Mean:

R

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> mean(x1)

[1] 3

* + Standard Deviation:

R

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> sd(x1)

[1] 1.581139

* + Median:

R

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> median(x1)

[1] 3

* + Minimum and Maximum:

R

Copy code

> min(x1)

[1] 1

> max(x1)

[1] 5

* + Summary:

R

Copy code

> summary(x1)

Min. 1st Qu. Median Mean 3rd Qu. Max.

1 2 3 3 4 5

These results illustrate how vectors in R can be manipulated and analyzed using basic statistical functions.

**Working with the Iris Dataset**

1. **Loading and Previewing the Data**: The iris dataset was loaded and inspected:

R

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> data("iris")

> head(iris)

The iris dataset contains measurements for sepal length, sepal width, petal length, petal width, and species.

1. **Basic Data Properties**:
   * Number of rows and columns:

R

Copy code

> nrow(iris)

[1] 150

> ncol(iris)

[1] 5

* + Dimensions of the dataset:

R

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> dim(iris)

[1] 150 5

1. **Summary Statistics**:
   * A summary of the iris dataset provides insight into the distributions of each feature:

R

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> summary(iris)

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

Length:150

Class :character

Mode :character

**Conclusion**

The analysis highlights the basics of arithmetic, variable manipulation, vector operations, and dataset analysis in R, using both simulated calculations and the iris dataset. The structured approach provides insight into R's data handling and manipulation capabilities, setting a foundation for more complex data analysis tasks.