Lab Internal-2

1220216010 14

(1) What are the types of objects in R?

Answer:

There are 6 types of objects in R Programming. They include vector, list, matrix, array, factor, and data frame.

(1) Vectors: One of the basic R programming data objects. They are six types of atomic vectors - logical, integer, character, raw, double and complex.

(2) Lists: Data objects of R that contain various types of elements including strings, numbers, vectors and a nested list inside it.

(3) Matrices: Used to arrange elements in the two dimensional layout.

(4) Array: Store data in more than just 2 dimensions.

(5) Factors: Data objects that are used in order to categorize and store data as levels.

(6) Data frame: 2 dimensional data structure where each column consists of the value of one variable and each row consists of a value set from each column.

(3) If-else in R:

```
if(condition)
{
  statement 1
}else{
```

statement 2

}

ex: a = 10

if (a %% 2 == 0)

{

print("even number")

} else {

print("odd number")

}

(4) vector:

empty vector:

x ← vector()

concatenate function(c):

x ← c("pranav", "balaji", "naimisha")

print(x)

[1] "Pranav"

[2] "Balaji"

[3] "Naimisha

length ( ) function:

length(x)

Add in vector:

x ← c("Hello")

x ← c("world", x)

print(x)

o/p: "world" "hello"

(5) Date frame:

Data frame of 2 columns and 5 rows each

my_data_frame ← data.frame(column_1 = 1:5,
column_2 = c("A", "B", "C", "D", "E"))

print(my_data_frame)

Library(MASS, lib.loc = "C:/Program Files/R/R-3.6.3/library")

painters

row.names(painters)

colnames(painters)

summary(painters)

is.factor(painters$School)

is.factor(painters$Drawing)

is.data.frame(painters)

(6) OPERATORS IN R:

An operator is a symbol that tells the computer compiler to perform specific mathematical or logical manipulations. R language is rich in built-in-operators and provides following types of operators

TYPE OF OPERATORS:

(1) Arithmetic operators: +, -, *, /, %%, %/%, ^

(2) Relational operators: >, <, ==, <=, >=, !=

(3) Logical operators: &, |, !, &&, ||

(4) Assignment operators:

Left Assignment: <- or = or <<-

Right Assignment: -> or ->>

(5) Miscellaneous operators: ":", %in%, %*%

(7) R GRAPHIC DEVICES:

A graphic device is something where you can make a plot appear.

TYPES OF GRAPHIC DEVICES:

(1) Pdf: useful for line-type graphics, resizes well, usually portable, not efficient if a plot has many objects/points.

2) SVG: XML-based scalable vector graphics, supports animation and interactivity, potentially useful for web-based

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Plots:

(3) win.metafile : Windows metafile format (only on Windows)

(4) postscript: older format, also resizes well, usually portable, can be used to create encapsulated postscript files, windows systems often don't have a postscript viewer.

(5) png: bitmapped format, good for line drawings or image with solid colours.

(6) jpeg: good for photographs or natural scenes

(7) tiff: creates bitmap files in the TIFF format, supports lossless compression.

(8) bmp: a native windows bitmapped format.

(8) R PROGRAM FOR FIRST 10 FIBONACCI NUMBER:

⇒

```
Fibonacci <- numeric(10)
Fibonacci <- Fibonacci [2] <-1
for (i in 3:10) Fibonacci[i] <- Fibonacci[i-2]+Fibonacci[i-1]
print("First 10 Fibonacci numbers:")
Print (Fibonacci)
```

OUTPUT:

"First 10 Fibonacci numbers:"

1 1 2 3 5 8 13 21 34 55

(9) ACCESSING the keyboard and Monitor:

(a) readline()

(b) cat()

(c) scan()

Reading from the keyboard:

(a) scan()

(b) readline

print() → displays the contents

READING AND WRITING FILES:

Reading from file:

read.table()

read.csv() [: for spreadsheet file]

readLines() [: reading a single file one line at a time]

write.table() [: write data frame in the form of a table]

10.

In R, Missing values are represented by the symbol NA (not applicable). Impossible values (domain errors like division by 0 et logs of negative numbers are represented by the symbol NAN (not-A-Number)).