

R Programming Assignment-10

1.What is the R language's standard syntax?

ANS:

Syntax of R program:

A program in R is made up of three things: Variables, Comments, and Keywords. Variables are used to store the data, Comments are used to improve code readability, and Keywords are reserved words that hold a specific meaning to the compiler.

Variables in R:

Previously, we wrote all our code in a print() but we don't have a way to address them as to perform further operations. This problem can be solved by using variables which like any other programming language are the name given to reserved memory locations that can store any type of data.

In R, the assignment can be denoted in three ways:

= (Simple Assignment)

<- (Leftward Assignment)

-> (Rightward Assignment)

2.In R, how do I see a list of preloaded datasets?

ANS: R comes with several built-in data sets, which are generally used as demo data for playing with R functions.

In this vignette, we will describe how to load and use R built-in data sets focusing on the Mtcars dataset.

We will be exploring the basic functions of the dataset using a few basic exploration R functions.

List of pre-loaded data:

Once you start your R program, there are example data sets available within R along with loaded packages.

If you just want to play with some test data to see how they load and what basic functions you can run, the default installation of R comes with several data sets.

The benefits of starting off using the pre-loaded data is that it gives you a chance to try analysis and plotting commands and there are a lot of online tutorials that use these sample sets.

To see the list of pre-loaded data, type the function `data()` into the R console and you will get a listing of pre-loaded data sets:

```
data()
```

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3.What are the similarities and differences between R and Python?

ANS:

Python

Python is a general-purpose language that is used for the deployment and development of various projects. Python has all the tools required to bring a project into the production environment.

R Programming

R is a statistical language used for the analysis and visual representation of data.

Python

Python is better suitable for machine learning, deep learning, and large-scale web applications.

Python has a lot of libraries. However, it can be complex to understand all of them.

Python can be used for various purposes like building a graphical user interface, develop games, etc., despite being an object-oriented language.

Python has a simple syntax and is easy to learn.

Python's statistical packages are less powerful.

Python is mainly used when the data analysis needs to be integrated with web applications.

Python can be used to build applications from scratch.

There are many python IDE's available to choose from, a few of them are Jupyter Notebook, Spyder, Pycharm, etc.

Python is more popular and has a vast user base. Primary users of python include developers and programmers.

R Programming

R is suitable for statistical learning having powerful libraries for data experiment and exploration.

R has fewer libraries compared to Python and is easy to know.

Along with object-oriented programming, R can also be used to develop music.

R has a relatively complex syntax and the learning curve is not straightforward.

R's statistical packages are highly powerful.

R is generally used when the data analysis task requires standalone computation (analysis) and processing.

R can be used to simplify complex mathematical problems.

A few of IDE's for the R language are RStudio, StatET, etc.

R is less popular among users. Its users include scientists and Researchers & Development who frequently rely on data analysis.

Key Differences

Python and R are the preferred languages in Data Science, Data Analysis, Machine Learning, etc. Although they are used for similar purposes they differ from each other. R mainly focuses on the statistical part of a project while Python is flexible in its usage and data analysis tasks.

R is a powerful tool for visualizing data in the form of graphs. It is difficult to use R in a production environment due to its yet-to-develop production tools, whereas Python is easily integrated with a complex work environment.

Considering performance, Python is a better option as it runs faster in all the environments than R. Nevertheless, both languages are fan favorites for people to work with depending on their usage.

4.Can you make an R programme that prints the first 20 prime numbers?

ANS: R PROGRAMMING CODE:

```
prime = 0:40
temp = 0
for(val in prime){
  if (val == 0){
    next
  } else if (val == 1){
    next
  } else if (val == 2){
    TRUE
    temp = val
  } else if (val %% temp == 0){
```

```
    next
    temp = temp + 1
  }
  print(val)
}
```

OUTPUT:

```
[1] 2
[1] 3
[1] 5
[1] 7
[1] 9
[1] 11
[1] 13
[1] 15
[1] 17
[1] 19
[1] 21
[1] 23
[1] 25
[1] 27
[1] 29
[1] 31
[1] 33
[1] 35
[1] 37
[1] 39
```

5.What are the benefits of using the R programming language?

ANS: Here are the powerful of R programming:

- Excellent for Statistical Computing and Analysis. ...
- Open-source. ...
- A Large Variety of Libraries. ...
- Cross-platform Support. ...
- Supports various Data Types. ...
- Can do Data Cleansing, Data Wrangling, and Web Scraping. ...
- Powerful Graphics. ...
- Highly Active Community.

6. In R, when should we utilise the 'next' statement?

ANS: Next statement in R is used to skip any remaining statements in the loop and continue the execution of the program. In other words, it is a statement that skips the current iteration without loop termination.

'next' is a loop control statement just like the break statement. But 'next' statement works opposite to that of break statement, instead of terminating the loop, it forces to execute the next iteration of the loop.

Next Statement in R Programming Language Syntax

next

Example:

Using next in the for loop R

R program to illustrate next in for loop

```
val <- 6:11
```

```
# Loop
```

```
for (i in val)
```

```
{  if (i == 8)
```

```
{
```

```
    # test expression
```

```
        next
    }
    print(i)
}
```

Output:

```
[1] 6
[1] 7
[1] 9
[1] 10
[1] 11
```

The next statement can be used with any other loop also like 'while' or 'repeat' loop in a similar way as it is used with for loop above.

7.In R, how can we assign a variable and then display it?

ANS:In R programming, assign() method is used to assign the value to a variable in an environment.

Syntax :

```
assign(variable, value)
```

Return :

Return the variable having value assigned.

Example:

```
# Using assign() method
assign("gfg", 10)
print(gfg)
```

Output:

```
[1] 10
```

8.Create a R programme that takes two numbers as input and performs a sum operation?

ANS:R PRAOGRAMMING CODE:

```
{  
  x <- readline(prompt="Enter first number :")  
  y <- readline(prompt="Enter second number :")  
  
  x <- as.integer(x)  
  y <- as.integer(y)  
  
  z = x + y  
  
  print(paste("Addition of two number is :",z))  
}
```

OUTPUT:

Enter first number :12

Enter second number :13

[1] "Addition of two number is : 25"

9.What data types does the r language support?

ANS: Data Types in R Programming:

In programming languages, we need to use various variables to store various information. Variables are the reserved memory location to store values. As we create a variable in our program, some space is reserved in memory.

In R, there are several data types such as integer, string, etc. The operating system allocates memory based on the data type of the variable and decides what can be stored in the reserved memory.

There are the following data types which are used in R programming:

Data type	Example	Description
Logical	True, False	It is a special data type for data with only two possible values which can be construed as true/false.
Numeric	12,32,112,5432	Decimal value is called numeric in R, and it is the default computational data type.
Integer	3L, 66L, 2346L	Here, L tells R to store the value as an integer,
Complex	Z=1+2i, t=7+3i	A complex value in R is defined as the pure imaginary value i.

Character	'a', "good", "TRUE", '35.4'	In R programming, a character is used to represent string values. We convert objects into character values with the help of <code>as.character()</code> function.
Raw		A raw data type is used to holds raw bytes.