R PROGRAMMING ASSIGNMENT 1

1.What is the r programming language, and how does it work?

Ans. The R programming language is actually a program for statistical computation traditionally used between statisticians intended for producing statistical application as well as graphics; it offers many other things a good programming language, high-level graphics interfaces to additional languages and debugging services, the source code to get them all of our Application ecosystems is usually written mainly through C, Fortran as well as, R is usually openly available under the GNU (General Public License) and precompiled binary variations which will be presented to numerous operating systems.

R programming is a scripting language that supports several statistical analysis techniques, machine learning models, and graphical visualizations for data analysis. It is an open-source programming language with large community support available. R programming language is easy to learn and implement. Several built-in functions and support packages are available to create an efficient R program, data models, and graphical charts. This language is a very popular and most preferred language by statisticians and data scientists for research and analytics. R language supports cross-platform portability and multiple operating systems. R programming scripts are easy to manage through R studio IDE.

2.How did the R programming language come to be?

Ans. The R language was closely modeled on the S Language for Statistical Computing conceived by John Chambers, Rick Becker, Trevor Hastie, Allan Wilks and others at Bell Labs in the mid 1970s, and made publicly available in the early 1980's. Robert and Ross established R as an open source project in 1995 since 1997, the R project has been managed by the R Core Group. And, in February 2000, came the first release of R. See also **Ross Ihaka's brief account** of how R got started highlights some of the connections between R and S.

They, along with many others, kept working on and using R. They continue to create new tools for R and fing new applications for R every day. There are over 10,000 user-created libraries that were built to enhance R functionality. These packages have crowdsourced quality-validation and support from recognized leaders in every field. All of this is great because R is the best at what it does:

R lets experts quickly, easily interpret and interact with and visualize data

Join the rapidly growing community of R users worldwide to see how open-source R continues to shape the future of statistical analysis and data science.

3.Create a tiny applications that's print the installed version of R?

ANS.

R PROGRAMING CODE:

Print(R.version.string)

OUTPUT:

“R version 3.4.4 (2018-08-15)”

4.Create a simple software that accepts user input (name , age , and qualifications) and display the results?

ANS.

R Programming Code:

name = readline(prompt=”input your name: “)

age = readline(prompt=”input your age: “)

qualification = readline(“prompt=input your qualification”)

print(paste(“My name is”,name,”and I am”,age ,”years old”and my qualification is”,qualification.))

BLACK SCREEN OUTPUT:

INPUT YOUR NAME:

Input your age :

Input your qualification:

OUTPUT:

“My name is _____and I am ____ years old and my qualification is ____.

5.what are some R programming application?

R Programming applications compass the universe from hypothetical,

computational statistics and the hard sciences, for example, astronomy,

chemistry, and genomics to practical applications in business, drug

advancement, finance, health care, marketing, medicine and much more. Since R has almost 5,000 packages (libraries of functions) large portions of which are committed to particular applications, you don't need to be an R Programming genius to begin developing your applications.

6.In which areas of health cares does R play a significant role ?

As a statistical programming language, R allows laboratorians and others to transform and analyze data and communicate results. It includes a wide variety of capabilities that provide greater functionality for working with data than Microsoft Excel and other commercial data analysis programs. R uses text-based commands to process data, and as such it functions as a full-fledged programming language for the advanced user.

Unlike Excel and many other graphical user interface (GUI)-based programs, R's reliance on text-based structure makes it straightforward to review at any time the commands used in a data processing pipeline to ensure that the correct steps were taken. Furthermore, the ability to view the underlying commands facilitates transparency and reproducibility of analyses.

The same text commands are used regardless of the size of the dataset; thus, it is just as easy for the user to perform an analysis on 1 million test results as it is to perform that analysis on 10 results. This feature makes it simple to automate and scale any process with R. In addition, the graphing capabilities of R far surpass that of Excel and many other GUI-based programs, in both functionality and potential for customization and automation

7.what is r studio ,and what does it do?

ANS.

RStudio is a powerful and easy way to interact with R programming, considered as Integrated Development Environment (IDE) that provides a one-stop solution for all the statistical computing and graphics. The RStudio is a more advanced version of R that comes with a multi-pane window setup that provides access to all primary things on a single screen (such as source, console, environment & history, files, photos, graphs, etc).

There are several reasons for which we should go for RStudio instead of R software.

We are listing down some real-life reasons here with examples.

1. A text-editor that is full-proof and full-featured.

You know having a text editor that allows you to have a colored syntax for different aspects (code, parentheses, brackets, etc.), matches parentheses automatically, autodetecting the syntaxes, and more. It is more future-proof for a user.

2. Allows to write scripts easily with tab-completion.

The tool is so intelligent that it can automatically detect the components of the function/file/dataset you are looking at.

Example:

See the screenshot below where we are not aware of the variables the “cars” data set contains. However, hitting tab gives me the exact list of variables from the dataset.

3. Objects stored in your environment are easy to access through the “Environment” tab.

This is an interesting feature. The Environment tab gives you access to all of the objects (variables, datasets, etc.) that are created in it for the session.

Example:

See the below screenshot where we could see all the objects stored in the local environment of my RStudio workspace.

4. Accessing your computer files/folders and setting a working directory is a walk on the cake.

It is a hectic job to set your working directory when you are working with R Software. However, with the RStudio, things become easier and you can access all the files and folders from your computer through a dropdown and then set the working directory with ease.

8.What is mapping and how does it works?

ANS.

Mapping

Often, data will include a spatial component, and you will want to map the data either for exploratory data analysis or to present interesting aspects of the data to others. R has a range of capabilities for mapping data. The simplest techniques involve using data that includes latitude and longitude values and using these location values as the x and y aesthetics in a regular plot. R also

has the ability to work with more complex spatial data objects and import shapefiles through extensions like the sp package.
In this section, we will cover the basics of mapping in R and touch on some of the more advanced possibilities. We will also present some useful packages for making quick but attractive maps in R. R also now has the capability to make interactive maps using the plotly and leaflet packages; in the end of this section, we'll present these packages and explain a bit more about htmlWidgets in general

Basics of mapping

Creating maps with ggplot2

The most basic way to map data in R is to create a regular ggplot object and map longitude to the x aesthetic and latitude to the y aesthetic. You can use this technique to create maps of geographic areas, like states or countries, and to map locations as points, lines, and other shapes. The ggplot2 package includes a few datasets with geographic information that can be accessed with the map_data function. We'll pull one of these to use as an example of this basic method of mapping.
You can use the map_data function from the ggplot2 package to pull data for maps at different levels ("usa," "state," "world," "county"). The data you pull give locations of the borders of geographic polygons like states and counties.

9.What is r graphics, and how does it works?

ANS.

An Introduction to R Graphics: c R graphics in a nutshell. In order to produce graphical output, the user calls a series of graphics functions, each of which produces either a complete plot, or adds some output to an existing plot. R graphics follows a "painters model," which means that graphics output occurs in steps, with later output obscuring any previous output that it overlaps. There are very many graphical functions provided by R and the add-on packages for

R, so before describing individual functions, Section 1.1 demonstrates the variety of results that can be achieved using R graphics. This should provide some idea of what users can expect to be able to achieve with R graphics. Section 1.2 gives an overview of how the graphics functions in R are organized. This should provide users with some basic ideas of where to look for a function to do a specific task. Section 1.3 describes the set of functions involved with the selection of a particular graphical output format. By the end of this chapter, the reader will be in a position to start understanding in more detail the core R functions that produce graphical output.

Standard plots:

R provides the usual range of standard statistical plots, including scatterplots, boxplots, histograms, barplots, piecharts, and basic 3D plots.

Trellis plots:

In addition to the traditional statistical plots, R provides an implementation of Trellis plots[6] via the package lattice[54] by Deepayan Sarkar. Trellis plots embody a number of design principles proposed by Bill Cleveland[12][13] that are aimed at ensuring accurate and faithful communication of information via statistical plots. These principles are evident in a number of new plot types in Trellis and in the default choice of colors, symbol shapes, and line styles provided by Trellis plots. Furthermore, Trellis plots provide a feature known as "multi-panel conditioning," which creates multiple plots by splitting the data being plotted according to the levels of other variables