

# Assignment

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## 1.) Understanding of nuts and bolts of R:

### a. R program Structure

### b. R Data Type, Command Syntax and Control Structures

### c. File Operations in R

Ans.) The Input and Output of the given question in R program compiler will be:

#### a.) R Program Structure:

```
> # R Program Structure Example
>
> # 1. Expressions and Assignment
> x <- 5
> print(x) # Output: [1] 5
[1] 5
>
> # 2. Comments
> # This is a comment. It won't be executed.
>
> # 3. Evaluation (Auto-printing)
> y <- 10
> y # Output: [1] 10
[1] 10
>
> # 4. R Objects (Vectors)
> my_vector <- c(1, 2, 3, 4, 5)
> print(my_vector) # Output: [1] 1 2 3 4 5
[1] 1 2 3 4 5
>
> # 5. Data Types
> a <- "Hello, World!" # Character
> b <- 3.14 # Numeric (real number)
> c <- TRUE # Logical (Boolean)
>
> # 6. Control Structures (if-else)
> if (c) {
+   print("It's true!")
+ } else {
+   print("It's false!")
+ }
[1] "It's true!"
>
> # 7. Loop Example (for loop)
> for (i in 1:5) {
+   print(paste("Iteration", i))
+ }
[1] "Iteration 1"
[1] "Iteration 2"
[1] "Iteration 3"
[1] "Iteration 4"
[1] "Iteration 5"
> |
```

## b.) R Data Type, Command Syntax and Control Structures

```
> > # Data Types and Variables
> x <- 10
> name <- "Ayandip Das 21BCE10364"
> is_done <- TRUE
>
> # Print Command
> print("Hello, World")
[1] "Hello, World"
>
> # Concatenation
> greeting <- "Hello"
> message <- paste(greeting, name, sep = ", ")
> print(message)
[1] "Hello, Ayandip Das 21BCE10364"
>
> # Control Structures
> if (x > 5) {
+   print("x is greater than 5")
+ } else {
+   print("x is less than or equal to 5")
+ }
[1] "x is greater than 5"
>
> # For Loop
> for (i in 1:5) {
+   print(i)
+ }
[1] 1
[1] 2
[1] 3
[1] 4
[1] 5
>
> # While Loop
> i <- 1
> while (i <= 5) {
+   print(i)
+   i <- i + 1
+ }
[1] 1
[1] 2
[1] 3
[1] 4
[1] 5
```

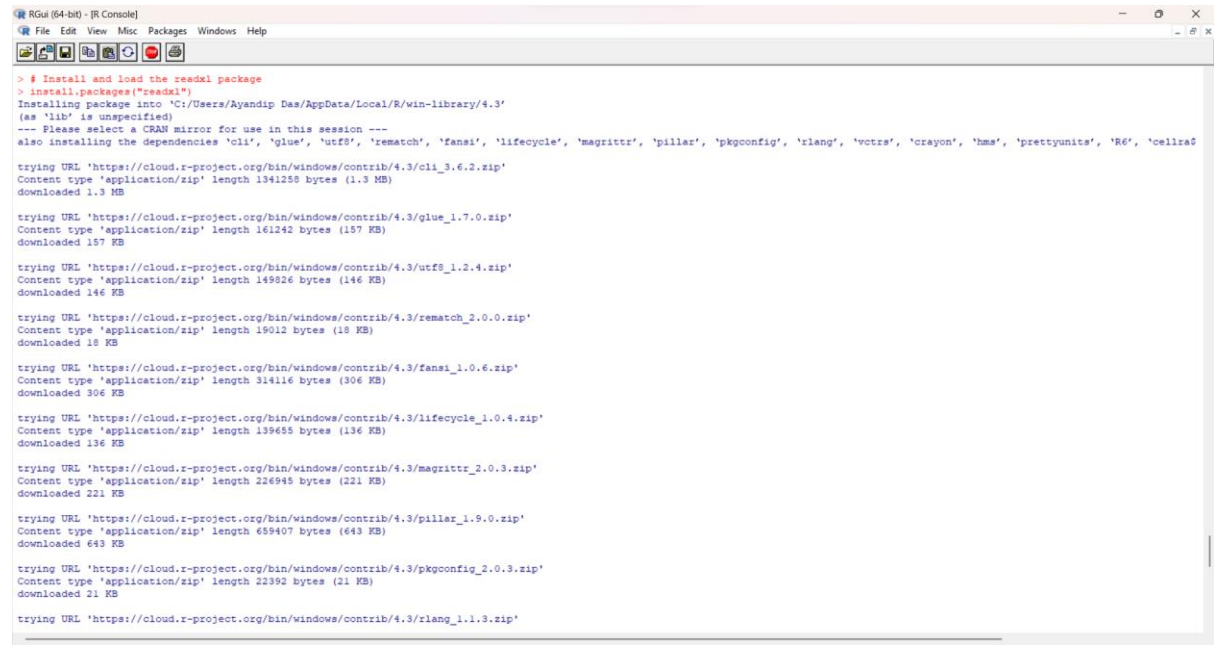
### c.) File Operations in R

```
> # File Operations in R
>
> # 1. Creating a File
> file.create("my_file.txt") # Creates a new file or truncates if it already exists
[1] TRUE
>
> # 2. Writing to a File
> data_to_write <- "Hello, World!\nThis is some text."
> writeLines(data_to_write, "my_file.txt") # Write data to the file
>
> # 3. Renaming a File
> file.rename("my_file.txt", "new_file.txt") # Renames the file
[1] TRUE
>
> # 4. Checking Existence of a File
> file_exists <- file.exists("new_file.txt")
> if (file_exists) {
+   print("The file exists.")
+ } else {
+   print("The file does not exist.")
+ }
[1] "The file exists."
>
> # 5. Reading Data from a File
> read_data <- readLines("new_file.txt")
> cat("Contents of the file:\n", read_data, sep = "\n")
Contents of the file:

Hello, World!
This is some text.
>
> # Clean up: Delete the file
> file.remove("new_file.txt")
[1] TRUE
> |
```

## 2.) Excel and R integration with R connector.

**Ans.)** The Input and output of the given question using R Program Compiler will be:



```
> # Install and load the readxl package
> install.packages("readxl")
Installing package into 'C:/Users/Ayandip Das/AppData/Local/R/win-library/4.3'
(as 'lib' is unspecified)
--- Please select a CRAN mirror for use in this session ---
also installing the dependencies 'cli', 'glue', 'utf8', 'rematch', 'fansib', 'lifecycle', 'magrittr', 'pillar', 'pkgconfig', 'rlang', 'vctrs', 'crayon', 'hms', 'prettyunits', 'R6', 'cellranger'

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/cli_3.6.2.zip'
Content type 'application/zip' length 1341250 bytes (1.3 MB)
downloaded 1.3 MB

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/glue_1.7.0.zip'
Content type 'application/zip' length 161242 bytes (157 KB)
downloaded 157 KB

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/utf8_1.2.4.zip'
Content type 'application/zip' length 149826 bytes (146 KB)
downloaded 146 KB

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/rematch_2.0.0.zip'
Content type 'application/zip' length 19012 bytes (18 KB)
downloaded 18 KB

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/fansib_1.0.6.zip'
Content type 'application/zip' length 314116 bytes (306 KB)
downloaded 306 KB

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/lifecycle_1.0.4.zip'
Content type 'application/zip' length 139655 bytes (136 KB)
downloaded 136 KB

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/magrittr_2.0.3.zip'
Content type 'application/zip' length 226948 bytes (221 KB)
downloaded 221 KB

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/pillar_1.9.0.zip'
Content type 'application/zip' length 659407 bytes (643 KB)
downloaded 643 KB

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/pkgconfig_2.0.3.zip'
Content type 'application/zip' length 22392 bytes (21 KB)
downloaded 21 KB

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/rlang_1.1.3.zip'
Content type 'application/zip' length 690597 bytes (674 KB)
downloaded 674 KB

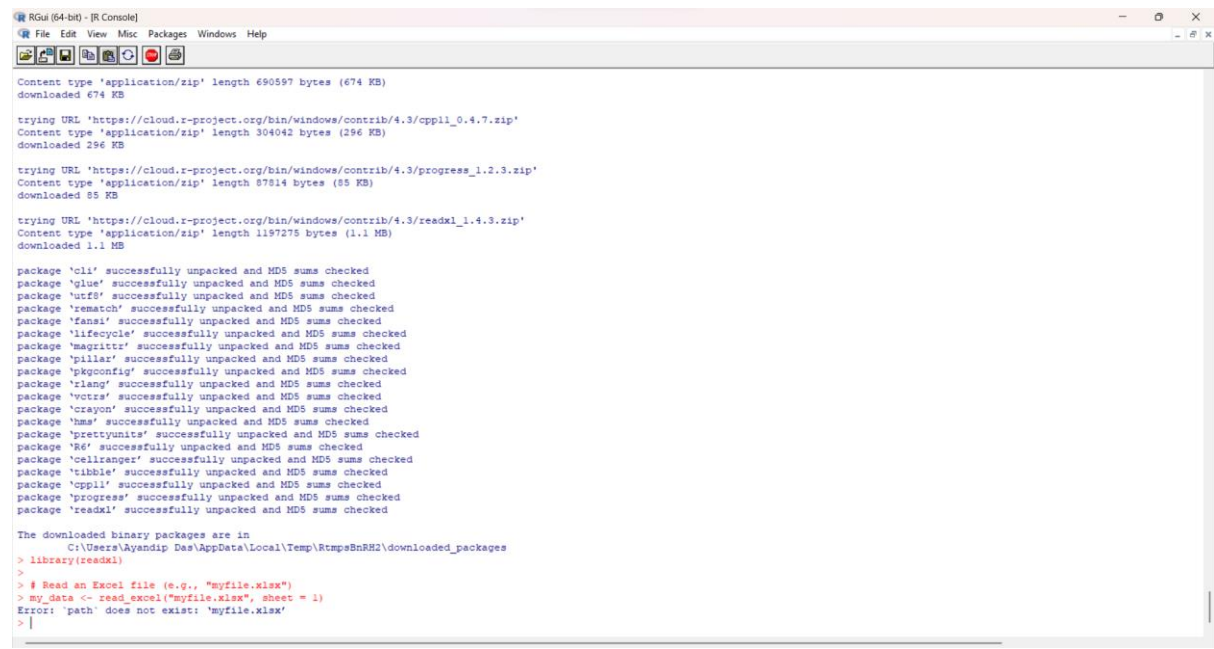
trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/cpp11_0.4.7.zip'
Content type 'application/zip' length 304042 bytes (296 KB)
downloaded 296 KB

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/progress_1.2.3.zip'
Content type 'application/zip' length 87814 bytes (85 KB)
downloaded 85 KB

trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/readxl_1.4.3.zip'
Content type 'application/zip' length 1197275 bytes (1.1 MB)
downloaded 1.1 MB

package 'cli' successfully unpacked and MD5 sums checked
package 'glue' successfully unpacked and MD5 sums checked
package 'utf8' successfully unpacked and MD5 sums checked
package 'rematch' successfully unpacked and MD5 sums checked
package 'fansib' successfully unpacked and MD5 sums checked
package 'lifecycle' successfully unpacked and MD5 sums checked
package 'magrittr' successfully unpacked and MD5 sums checked
package 'pillar' successfully unpacked and MD5 sums checked
package 'pkgconfig' successfully unpacked and MD5 sums checked
package 'rlang' successfully unpacked and MD5 sums checked
package 'vctrs' successfully unpacked and MD5 sums checked
package 'crayon' successfully unpacked and MD5 sums checked
package 'hms' successfully unpacked and MD5 sums checked
package 'prettyunits' successfully unpacked and MD5 sums checked
package 'R6' successfully unpacked and MD5 sums checked
package 'cellranger' successfully unpacked and MD5 sums checked
package 'tibble' successfully unpacked and MD5 sums checked
package 'cpp11' successfully unpacked and MD5 sums checked
package 'progress' successfully unpacked and MD5 sums checked
package 'readxl' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
C:\Users\Ayandip Das\AppData\Local\Temp\RtmpBnRH2\downloaded_packages
> library(readxl)
>
> # Read an Excel file (e.g., "myfile.xlsx")
> my_data <- read_excel("myfile.xlsx", sheet = 1)
Error: 'path' does not exist: 'myfile.xlsx'
>
```



```
RGui (64-bit) - [R Console]
File Edit View Misc Packages Windows Help

package 'fansy' successfully unpacked and MD5 sums checked
package 'lifecycle' successfully unpacked and MD5 sums checked
package 'magrittr' successfully unpacked and MD5 sums checked
package 'pillar' successfully unpacked and MD5 sums checked
package 'pkgconfig' successfully unpacked and MD5 sums checked
package 'rlang' successfully unpacked and MD5 sums checked
package 'vctrs' successfully unpacked and MD5 sums checked
package 'crayon' successfully unpacked and MD5 sums checked
package 'hms' successfully unpacked and MD5 sums checked
package 'prettyunits' successfully unpacked and MD5 sums checked
package 'R6' successfully unpacked and MD5 sums checked
package 'cellranger' successfully unpacked and MD5 sums checked
package 'tidyverse' successfully unpacked and MD5 sums checked
package 'opll' successfully unpacked and MD5 sums checked
package 'progress' successfully unpacked and MD5 sums checked
package 'readxl' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
  C:\Users\Ayandip Das\AppData\Local\Temp\RtmpsBnRH2\downloaded_packages
> library(readxl)
>
> # Read an Excel file (e.g., "myfile.xlsx")
> my_data <- read_excel("myfile.xlsx", sheet = 1)
Error: 'path' does not exist: 'myfile.xlsx'
> # Install and load the writexl package
> install.packages("writexl")
Installing package into 'C:/Users/Ayandip Das/AppData/Local/R/win-library/4.3'
(as 'lib' is unspecified)
trying URL 'https://cloud.r-project.org/bin/windows/contrib/4.3/writexl_1.5.0.zip'
Content type 'application/zip' length 203483 bytes (198 KB)
downloaded 198 KB

package 'writexl' successfully unpacked and MD5 sums checked

The downloaded binary packages are in
  C:\Users\Ayandip Das\AppData\Local\Temp\RtmpsBnRH2\downloaded_packages
> library(writexl)
>
> # Create a sample data frame
> my_data <- data.frame(Name = c("Alice", "Bob"), Age = c(25, 30))
>
> # Write the data frame to an Excel file
> write_xlsx(my_data, path = "output.xlsx")
> |
```