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FDS Activity – 1

Introduction to R programming language

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2021 -2022

What is R?

R is an **open-source** programming language and environment used for statistical analysis, data visualization, and data science.

Why use R?

- ✓ R can be used for data analytics, statistical analysis, as well as **machine learning** purposes.
- ✓ R is compatible with a number of different technologies and is highly flexible.
- ✓ R is an **interpreted language** and does not need a compiler. It generates a machine-independent code that is easy to debug and is highly portable.
- ✓ It is **platform-independent**, which means it can be used across all operating systems.
- ✓ R has **superb graphical capabilities** that are far better than any other statistical language.

These R programming topic have been made use of in the following program:

- ➢ R control structures: if - else

Syntax:

```
if (test_expression) {

statement1

} else {

statement2

}
```

Flowchart of if…else statement

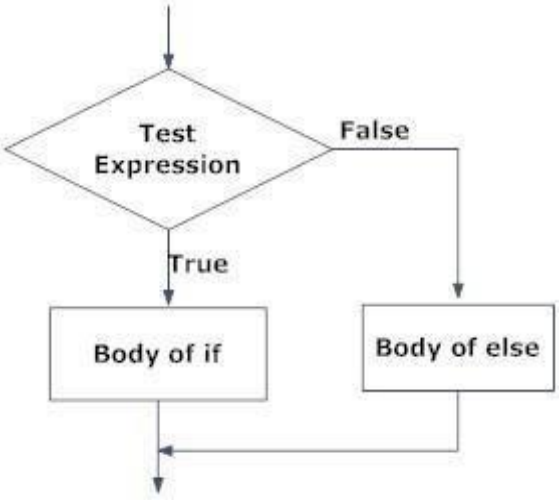


Fig: Operation of if...else statement

The **if-else** in R enforce **conditional execution** of code. They are an important part of R's decision-making capability. It allows us to make a decision based on the result of a condition. The `if` statement contains a condition that evaluates to a **logical output**. It runs the enclosed code block if the condition evaluates to `TRUE`. It skips the code block if the condition evaluates to `FALSE`.

We use the `else` statement with the if statement to enact a choice between **two alternatives**. If the condition within the `if` statement evaluates to `FALSE`, it runs the code within the `else` statement.

- readline() method in R:

In R language, the readline**()** method takes input in string format. If one inputs an integer then it is inputted as a string, lets say, one wants to input **255**, then it will input as **“255”**, like a string. So one needs to convert that inputted value to the format that he needs. In this case, string **“255”** is converted to integer 255. To convert the inputted value to the desired data type, there are some functions in R.

as.integer(n); —> convert to integer

Syntax:

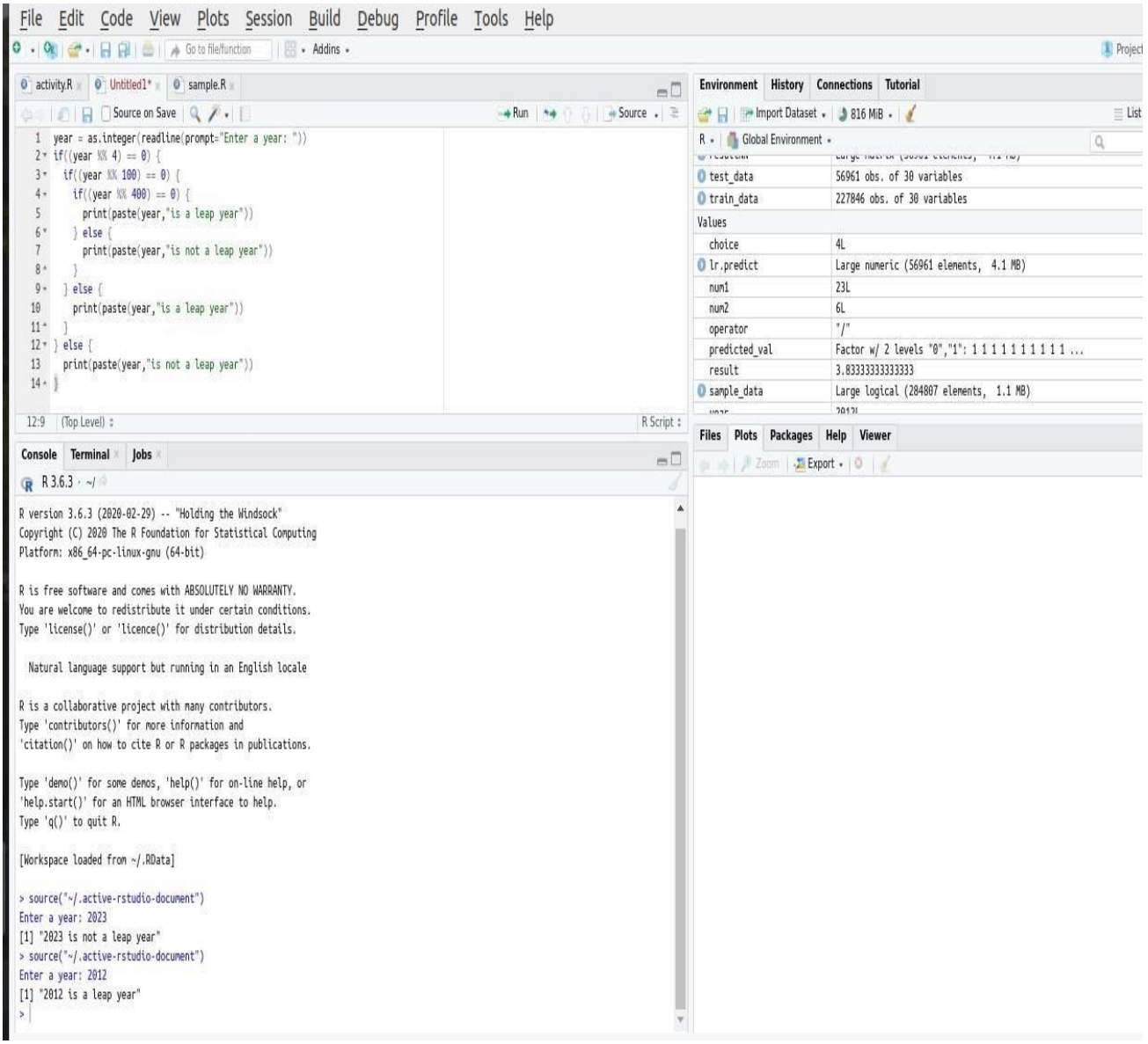
```
var ← readline();
var ← as.integer(var);
```

PROGRAM : To check a given year is leap or not in R

```
year = as.integer(readline(prompt="Enter a year: "))

if((year %% 4) == 0){
    if((year %% 100) == 0){
      if((year %% 400) == 0){
     print(paste(year,"is a leap year"))
  }
    else {
     print(paste(year,"is not a leap year"))
   }
} else {
print(paste(year,"is a leap year"))
}
} else {
print(paste(year,"is not a leap year"))
}
```

OUTPUT


File Edit Code View Plots Session Build Debug Profile Tools Help
activity.R
Untitled1*
sample.R
Source on Save
Run
Source
year = as.integer(readline(prompt="Enter a year: "))
if((year %% 4) == 0) {
if((year %% 100) == 0) {
if((year %% 400) == 0) {
print(paste(year,"is a leap year"))
} else {
print(paste(year,"is not a leap year"))
}
} else {
print(paste(year,"is a leap year"))
}
} else {
print(paste(year,"is not a leap year"))
}
12:9 (Top Level)
R Script
Console
Terminal
Jobs
R 3.6.3 · ~/
R version 3.6.3 (2020-02-29) -- "Holding the Windsock"
Copyright (C) 2020 The R Foundation for Statistical Computing
Platform: x86_64-pc-linux-gnu (64-bit)
R is free software and comes with ABSOLUTELY NO WARRANTY.
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.
Natural language support but running in an English locale
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.
Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.
[Workspace loaded from ~/.RData]
> source("~/.active-rstudio-document")
Enter a year: 2023
[1] "2023 is not a leap year"
> source("~/.active-rstudio-document")
Enter a year: 2012
[1] "2012 is a leap year"
>
Environment
History
Connections
Tutorial
Import Dataset
816 MiB
R
Global Environment
test_data 56961 obs. of 30 variables
train_data 227846 obs. of 30 variables
Values
choice 4L
lr.predict Large numeric (56961 elements, 4.1 MB)
num1 23L
num2 6L
operator "/"
predicted_val Factor w/ 2 levels "0","1": 1 1 1 1 1 1 1 1 1 ...
result 3.83333333333333
sample_data Large logical (284807 elements, 1.1 MB)
Files
Plots
Packages
Help
Viewer
Zoom
Export