- Institut Pasteur de Madagascar
- January 2020

Writing For Loops, If-Else Statements, and Functions in R

- **E^2M^2: Ecological and Epidemiological Modeling in Madagascar**

The Power of Programming

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  - We write commands and it executes them.

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    2. For-loops
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- Three key programming tools are helpful:
  1. If-else and ifelse statements
  2. For-loops

  Allow you to control the flow of our programming and cause different things to happen depending on the value of tests

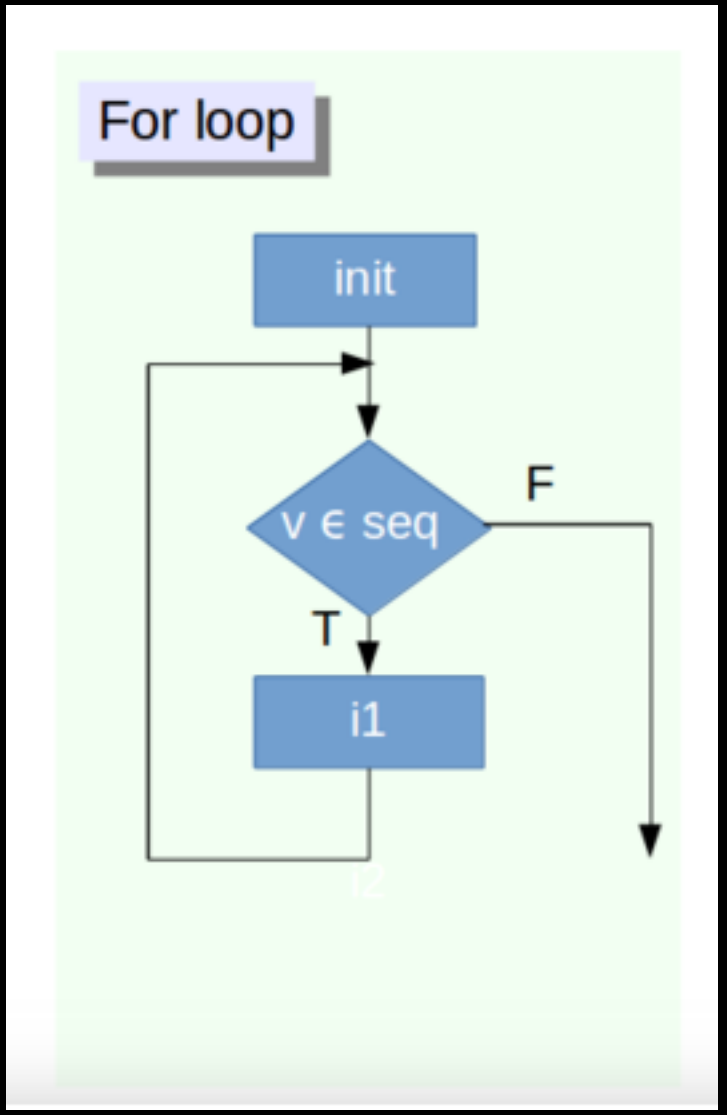
  3. Functions

For-Loops

for (variable in vector)

{ do something }

For (i in 1:10) {print i}



For-loops

- “Looping”, “cycling”, “iterating” is nothing more than automating a multi-step process by organizing sequences of actions or ‘batch’ processes and by grouping the parts that need to be repeated.
- For loops execute for a prescribed number of times, as controlled by a counter or an index, incremented at each iteration cycle.

If Statements

If condition is TRUE, then perform some action; otherwise do not perform that action.

if (condition is TRUE)

{ do something }

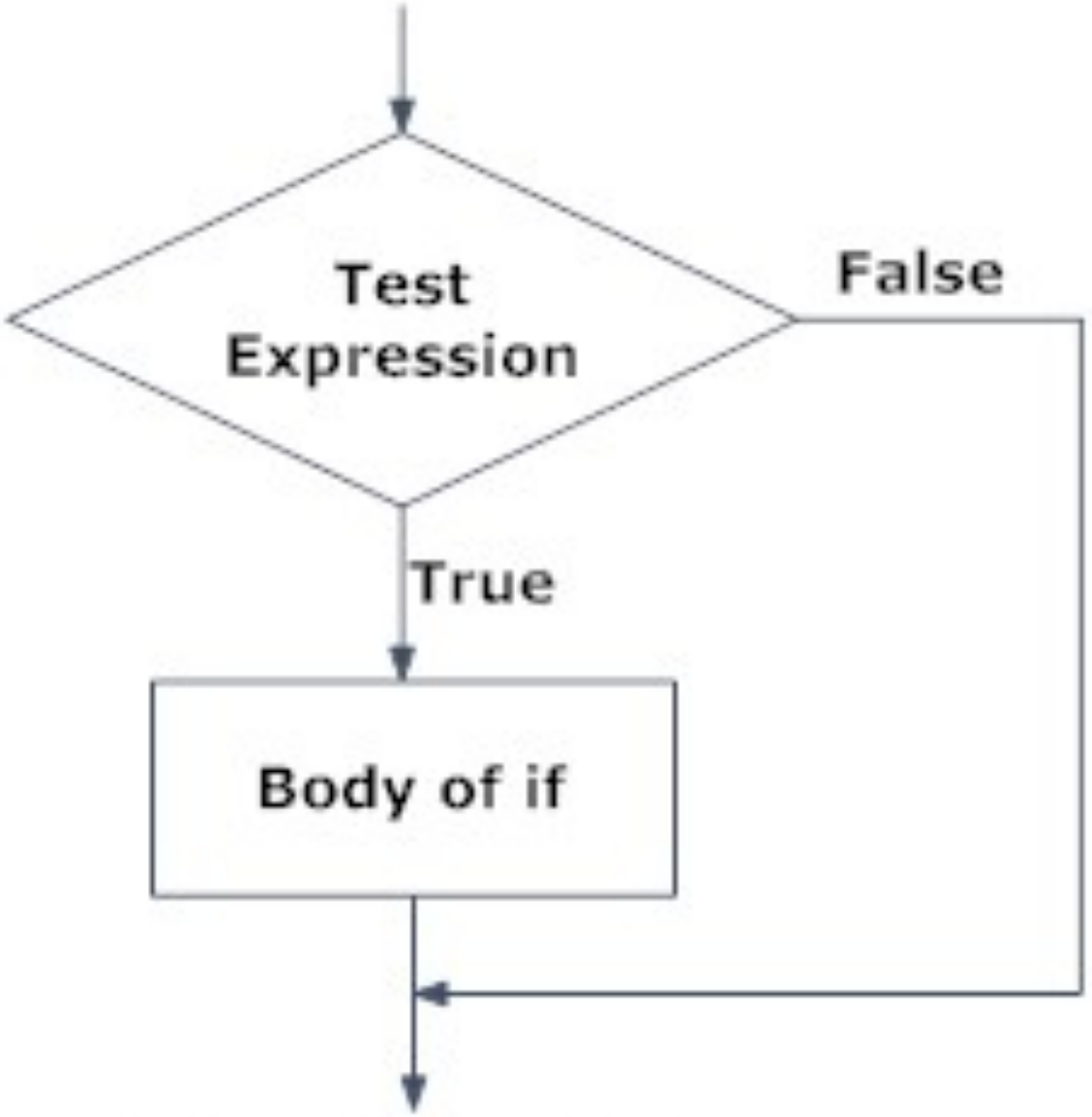


Fig: Operation of if statement

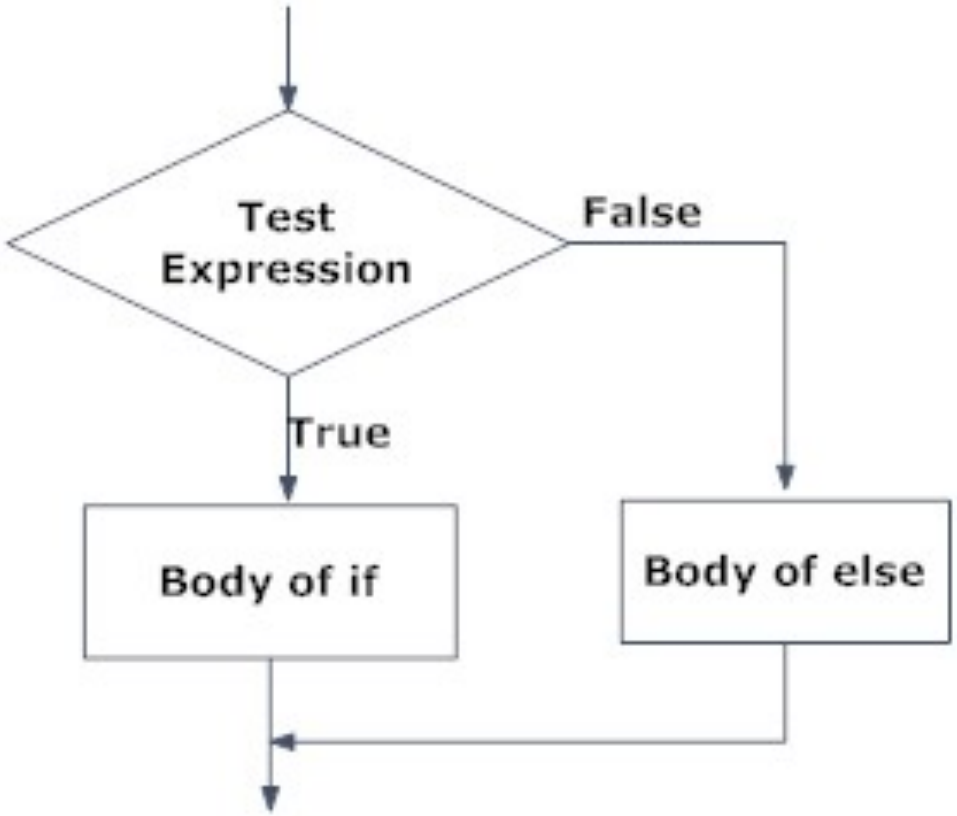
If-Else Statements

If condition is TRUE, then perform some action; otherwise do not perform that action.

if (condition is TRUE)

{ do something }

else { do different thing }



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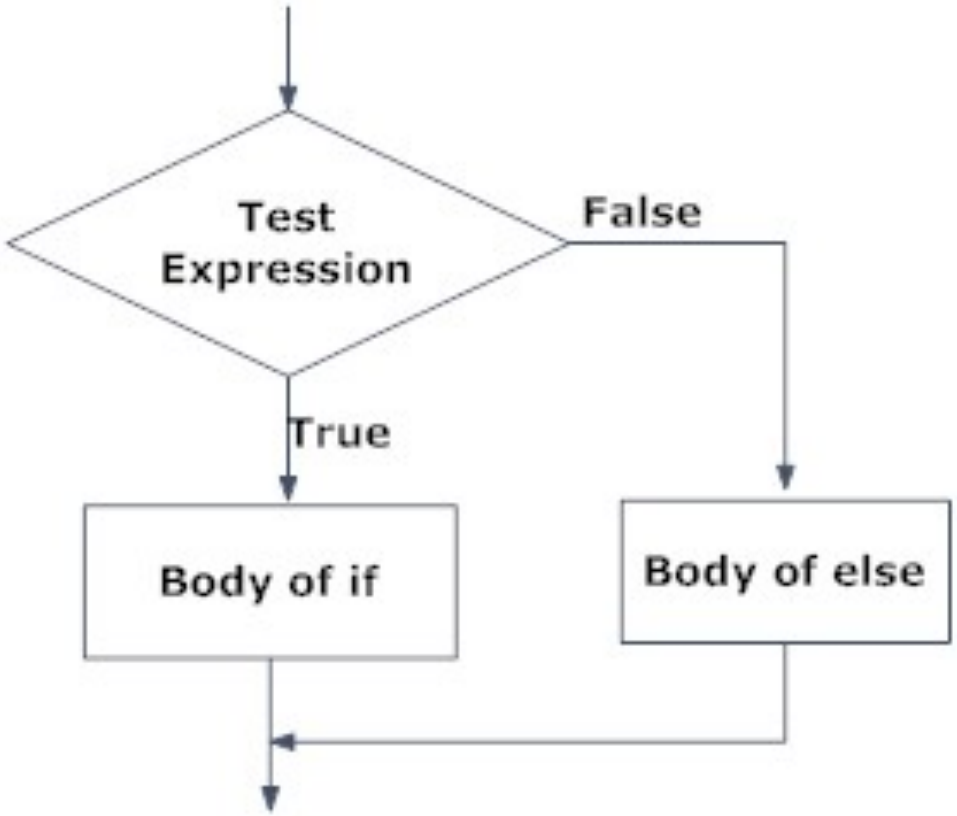

Fig: Operation of if...else statement

It is important to note that else must be in the same line as the closing braces of the if statement.

Functions

- A function is a piece of code written to carry out a specified task;
- mean(x), sum(x),….rep(x,y)
- Lots of pre-written functions organized in multitude of packages.
- If you can not find a function in R to do what you need, you can write your own function

Functions

- Avoid writing repetitive lines of codes:
  - Reduce workload
  - Help avoid errors

- Make it easy to reuse and share task for different data sets/ users

Functions

```
function_name <- function(arguments) {
                        body }
```

where the code in between the curly braces is the *body* of the function.

Functions

- Things to consider:
  - Function allows you to define exactly what you want to do
  - Name your user defined function.
  - Make sure that the name that you choose for the function is not an R reserved word. This means that you, for example, don’t want to pick the name of an existing function for your own UDF.

Let’s try it out in R

Open: “ForLoops_FunctionsWorkingScript.R”