

Intermediate R

Argument matching and defaults: The mechanism by which R matches function inputs to parameters either by position or by name, and where parameters can have default values that are used when the caller omits them.

Break: A control statement that immediately exits the nearest enclosing loop (for or while), skipping any remaining iterations and continuing execution after the loop.

Comparison operators (<, >, <=, >=): Operators that test ordering relations between values or comparable objects, returning TRUE or FALSE for less-than, greater-than, less-than-or-equal-to, and greater-than-or-equal-to comparisons.

CRAN (Comprehensive R Archive Network): The central repository of R packages and related resources from which `install.packages()` downloads and installs packages for use in R.

Date and POSIXct classes (`as.Date()`, `as.POSIXct()`, `Sys.Date()`, `Sys.time()`): Specialized R classes and conversion functions for representing calendar dates (Date) and date-times with seconds precision (POSIXct), enabling arithmetic, formatting, and interoperable time computations across systems.

Element-wise (vectorized) operation: An operation that is automatically applied to each element of a vector or array, producing an output vector or array of the same shape without explicit looping.

Else / Else if: Complementary control-flow constructs used after an if statement where else provides an alternative code block when the if condition is FALSE, and else if allows testing an additional condition if the preceding if was FALSE.

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Function (R function): A reusable block of code that accepts input arguments, performs computations or actions, and returns a result, with the last evaluated expression returned implicitly unless `return()` is used.

`grepl()`, `grep()`, `sub()`, `gsub()`: `grepl()` tests for pattern matches and returns a logical vector, `grep()` returns indices of matching elements, `sub()` replaces only the first match in each string, and `gsub()` replaces all matches in each string.

If statement: A control-flow construct that evaluates a condition and executes the enclosed code block only when the condition is TRUE.

Inequality operator (`!=`): The relational operator that tests whether two R objects are not equal and returns TRUE when they differ and FALSE when they are the same.

`install.packages()`, `library()`, `require()`: `install.packages()` downloads and installs a package from a repository

`lapply()`: An apply-family function that iterates over a list or vector and applies a function to each element, always returning a list of results with the same length as the input.

`library()` loads an installed package into the current session and adds it to the search path

Logical AND (`&`, `&&`): An operator that returns TRUE only when both operands are TRUE

Logical NOT (`!`): A unary operator that negates a logical value, turning TRUE into FALSE and vice versa, and can be applied element-wise to logical vectors.

Logical OR (`|`, `||`): An operator that returns TRUE when at least one operand is TRUE

Next: A control statement that skips the remainder of the current loop iteration and proceeds with the next iteration of the loop.

Package: A bundled collection of R functions, data, documentation, and tests that extends R's capabilities and must be installed (e.g., from CRAN) and loaded into a session to use its contents.

Regular expression (regex): A pattern language made of literal characters and metacharacters used to search, match, extract, or replace text substrings according to complex rules.

Relational operator: An operator that compares two R objects (such as values, strings, or logicals) and returns a logical result indicating their relationship, e.g., `<`, `>`, `==`, `!=`, `<=`, `>=`.

`require()` also loads a package but returns FALSE (not an error) if loading fails, making it useful inside functions.

`return()`: A function statement that forces an immediate return of a specified value from a function, terminating its execution regardless of remaining code in the body.

`sapply()`: A convenience wrapper around `lapply()` that attempts to simplify `lapply()`'s list output to a vector or matrix when possible, returning a list only when simplification cannot be meaningfully done.

the single `&` performs element-wise comparisons on vectors while the double `&&` evaluates only the first element of each operand.

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`vapply()`: A safer alternative to `sapply()` that applies a function like `lapply()` but requires the user to explicitly specify the expected type and length of each result via the `FUN.VALUE` template, causing an error if results don't match.

While loop: A loop that repeatedly executes its body as long as a specified logical condition remains TRUE, so it may run zero or many times and must eventually be made to terminate.