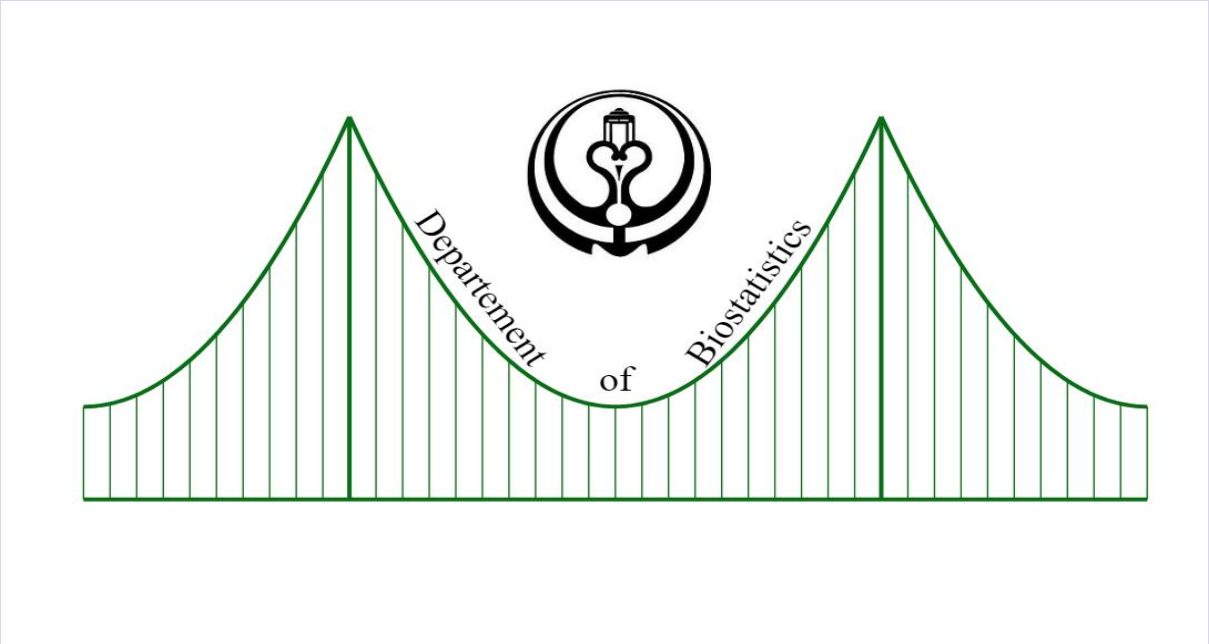

R Programming WorkShop

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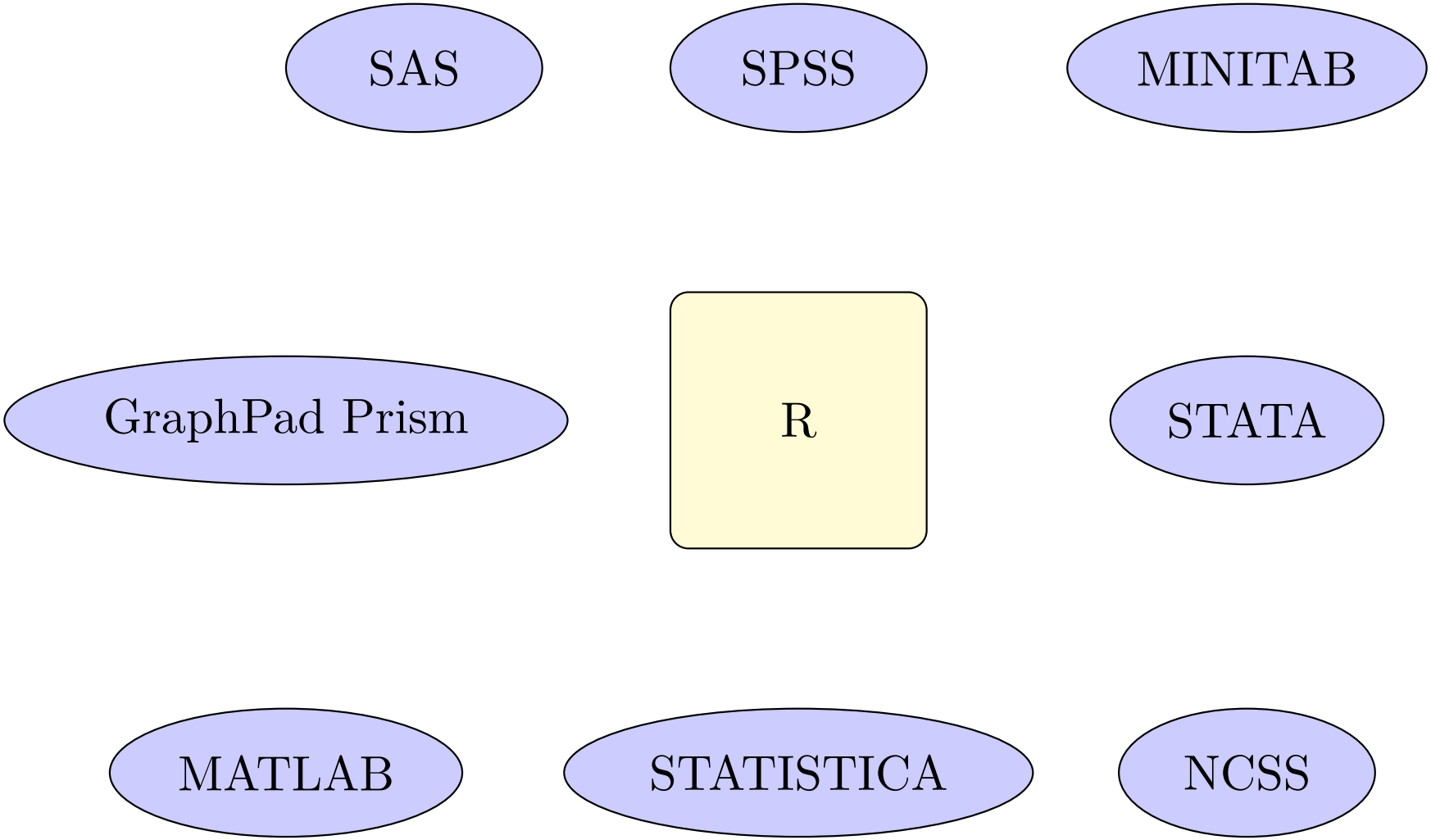
1402-1403

A Brief History of R

- 1976 S-Bell Labs: Fortran
  - John Chambers
  - Rick Becker
  - Allan Wilks
- 1988 S Version 3: C language
  - John Chambers
- 1991 R Created
  - Ross Ihaka
  - Robert Gentelman
- 1993 R Announced
- 2000 R Version 1 Released
- 2020 8th rank of programming languages
- 2023 16th rank of Programming languages

Why R?


SAS
SPSS
MINITAB
GraphPad Prism
R
STATA
MATLAB
STATISTICA
NCSS

Types of conditional structures in R

type of conditional structures in R

- if
- if-else
- ifelse

if structure

Why We Using if structure?

Sometimes we need a certain task to be done only when a condition is met, otherwise we want the normal flow of the program to be maintained if the condition is not met.

Example of if structure

Ex. (i)

Get a number from the user, if the number to the remainder of the number to the number is five times 2 or 3, put Greate value in the output, and do nothing otherwise.

Labs

Go to the coding environment →

if-else

B

ut there are times when we need to change the path of the program for any answer when we check the condition. And it is even possible to obtain different modes for different modes.

structure of if-else

CodeBlock

```
if (condition) {
command1
command2
...
} else{
if {
...
}
```

Example

Ex. (ii)

take a number from the user, of course, with the condition that it is greater than 20, then if the remainder of this number is zero compared to five numbers, print the value of ”A” in the output, if was 1, print the value of ”B” in the output, if it was 2, print the value of ”CC” in the output and if it was 3, print the value of ”C” in the output, and finally, if it was 4 Print the value of ”D” in the output.

Labs

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ifelse

ifelse

Sometimes we are faced with a binary situation, if the condition is met, one thing will happen, and if the condition If it is not established, one more thing will happen and our conditional structure will not extend further. R programming language has defined a very simple structure for this mode by the name of ifelse.

Example

Ex. (iii)

Get an output from the user. If the output was even, it returns the value ”even” and otherwise it returns the value ”odd”.

Labs

Go to the coding environment →

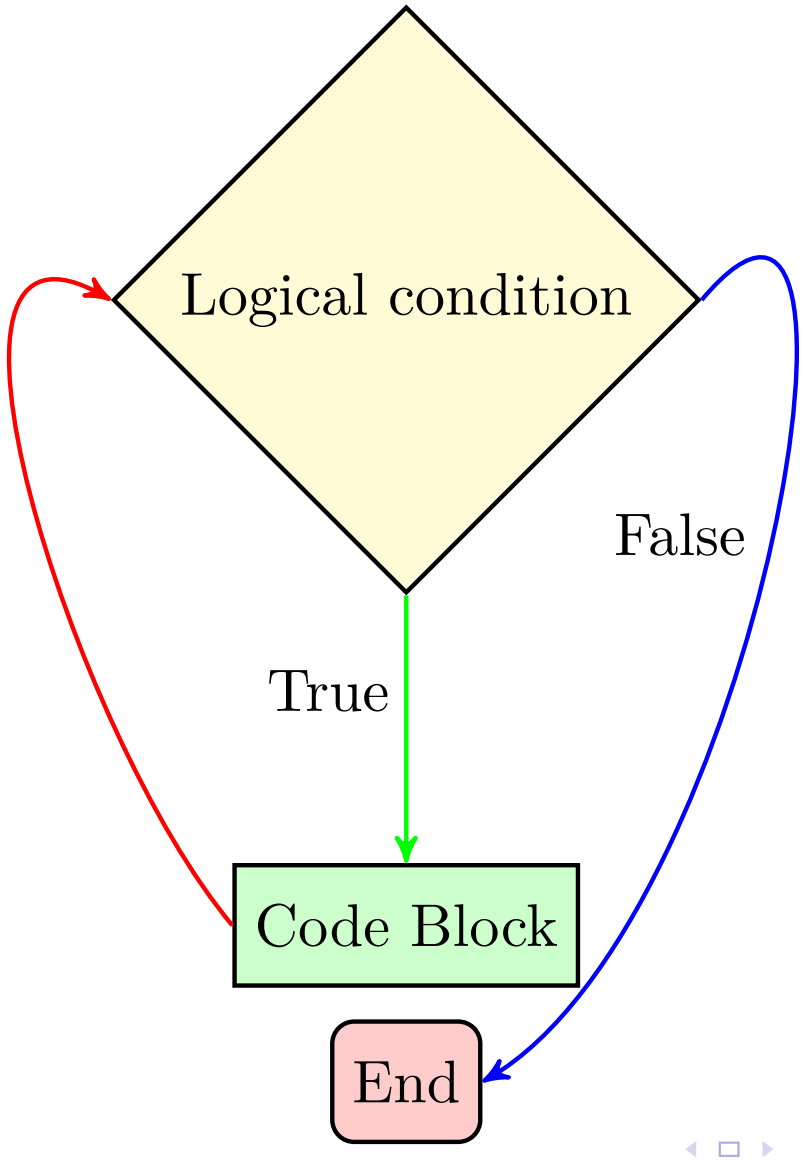
Why Using Loops in Programming?

loops are an essential tool in programming that allow you to execute a block of code repeatedly until a certain condition is met. They are useful for performing repetitive tasks without writing the same code multiple times.

Loops in R

- Using while loop
- Using repeat loop
- Using for loop

why do we use while loop?



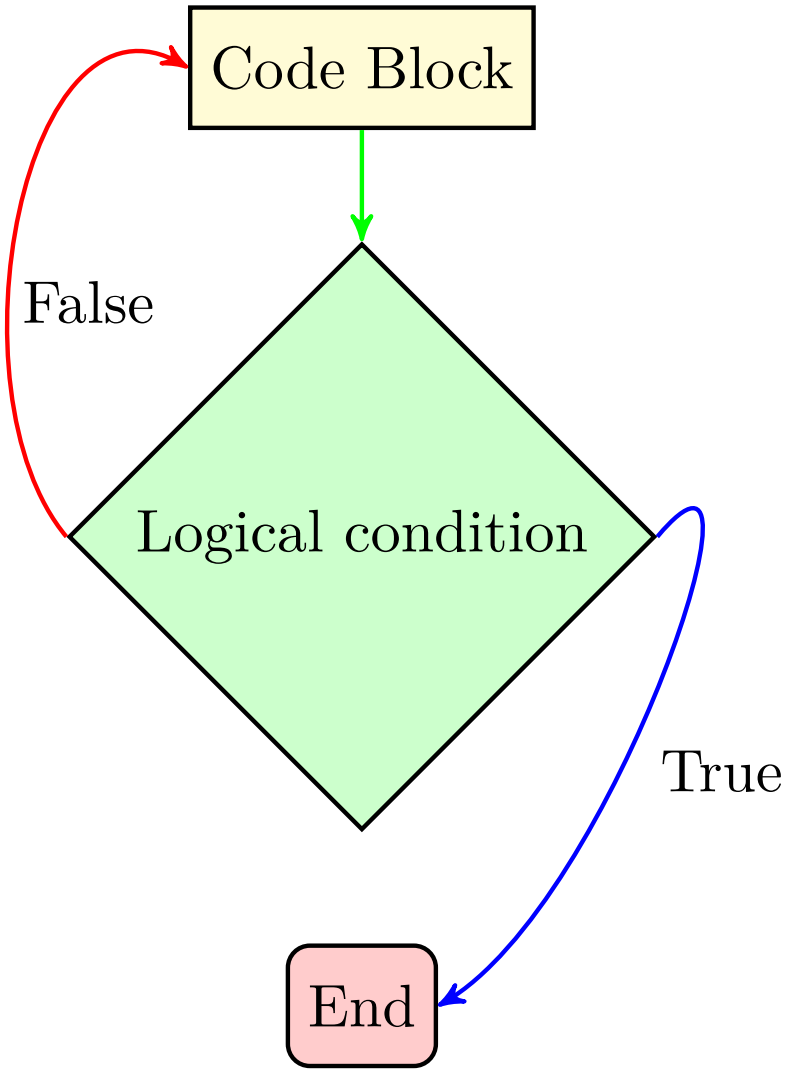
Ex (iv).

$$f(x) = \exp(x) - x^2,$$
$$\text{if} \quad f(x) = 0 \implies x = \ ?$$

Labs

Go to the coding environment →

why do we use repeat loop?



Ex (v).

By referring to the example in slide (19), get the numerical answer using loop repeat.

Labs

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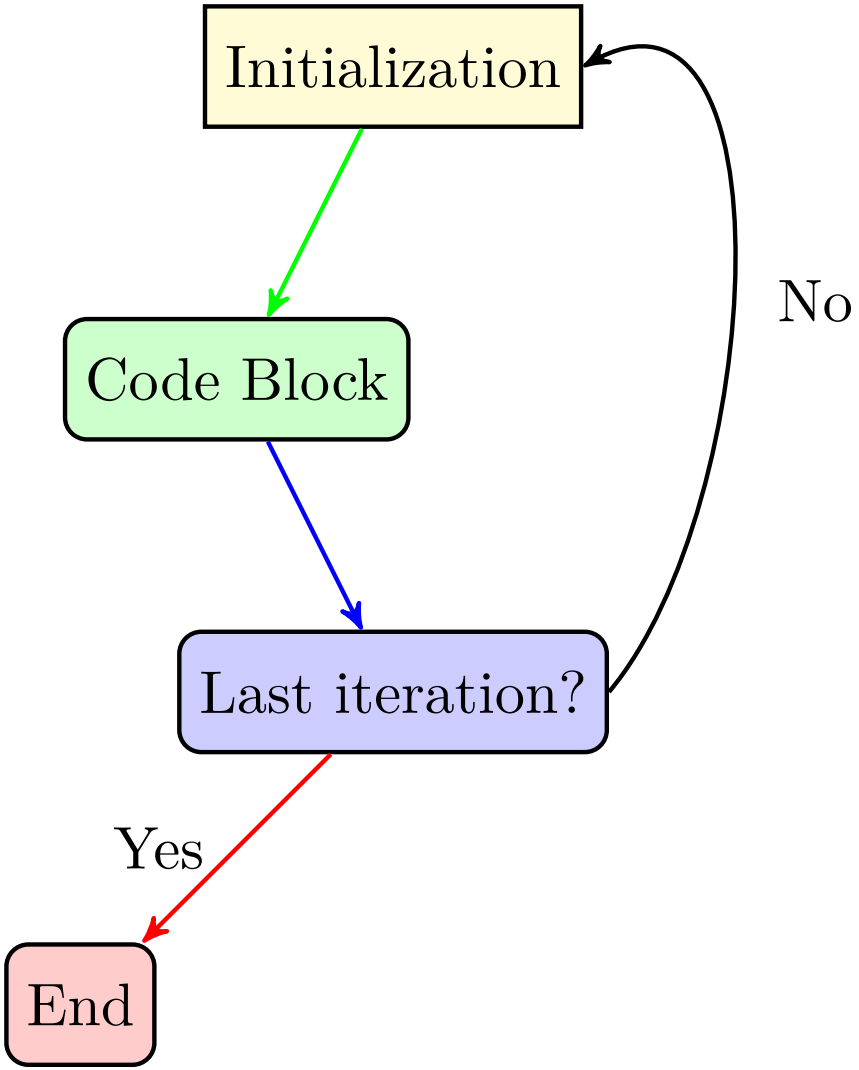
Why do we use For loop?



Example (vi):

Generate a matrix with 10 rows and 10 columns of integer values.

a) Calculate the row sum of this matrix using the for loop.

b) Using the "next" command, if the sum of a row is more than 500, do not print that row sum in the output.

c) If a row is calculated whose sum is greater than 600, the loop will stop. using the command (break)

Labs

Go to the coding environment →