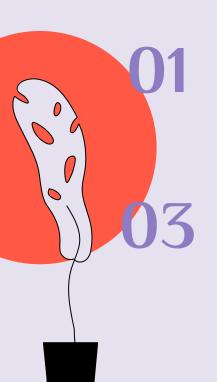
Introduction to Programming

Section II





Content



Programming

General context of programming

Flow diagrams

Explanation and creation of flow diagrams

02

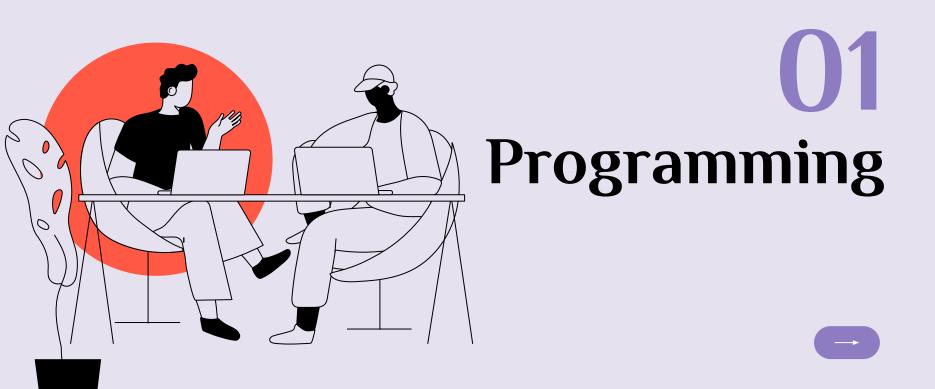
Algorithm

Algorithm explanation and examples

04

Basic sentences

Main sentences in programming



What is programming?

Action and effect of scheduling - RAE

Programming is the action of scheduling that implies ordering, structuring or composing a series of chronological actions to fulfill an objective.

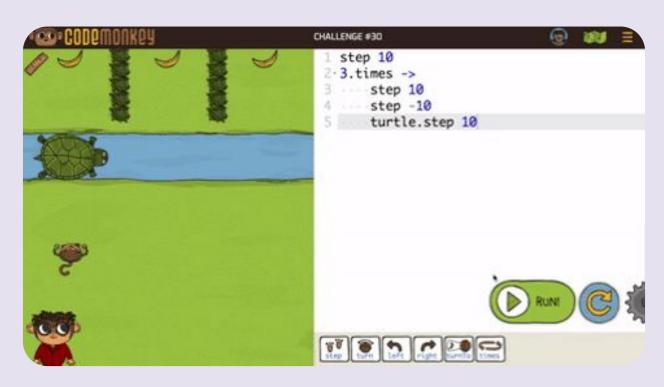
- significados.com

Programming is the act of programming, that is, **organizing a sequence** of orderly steps to follow to **do a certain thing**

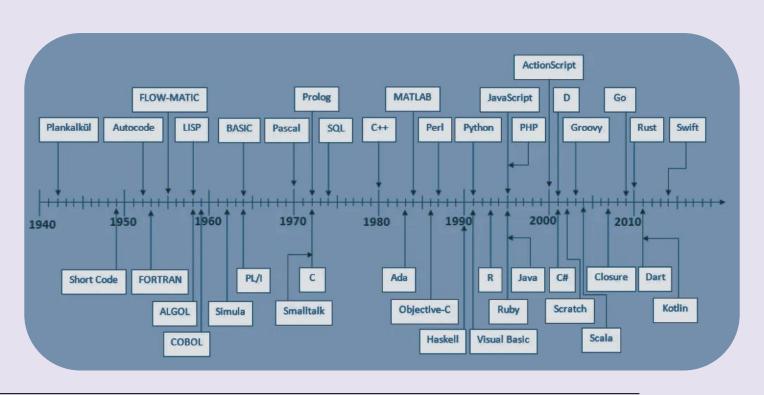
- concepto.de

```
var atpos=inputs[i].index0
var dotpos=inputs[i].last
 if (atpos<1 | dotpos<at
 document.getElementByI
    document.getElementB
```

What is programming?



Timeline

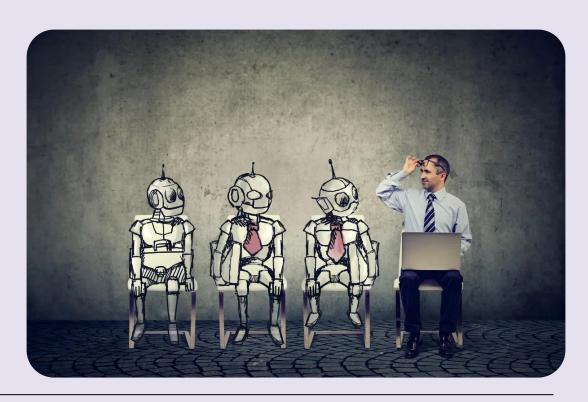


Why is it important?

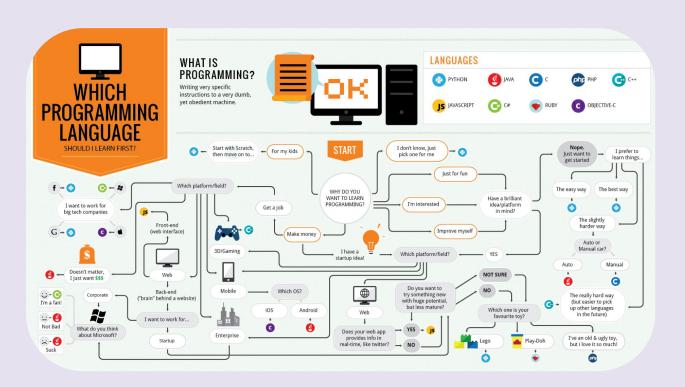
- Automates process
- **Controls** a large number of devices
- Generatestools for everyday life.
 - Video conferencing
 - Digital repositories or warehouses
 - Learning and entertainment.
 - Economics, Commerce and event.
- Reduces time and optimizes actions







Areas of use



Areas of use



16.1% Java (1995)



Java is object-oriented, class-based, and for all-round programming in general. It was designed to run on any system, is versatile and arguably the current king of the hill for programming languages

~ 130.000 USD



6.3% Python (1991)



Python is highly flexible and variable. It is excellent for back end web development, big data analysis, Al. scientific computing. neuronal networks, games, desktop apps and

productivity tools. ~ 110.000 USD



2.8% PHP (1995)



PHP is the foundation of every dynamic website and thus the base of web 2.0. If you are a web developer, you should defini tely know PHP. It is the basis of many CMS like

~ 75.000 USD



15.6% C (1969)



C is the grandfather of programming languages. Still popular for its top performance ("close to the metal"). The best, if you need to code a device driver, not great if you have to create a web app.

~ 100.000 USD



4.2% Visual Basic.NET



(2002)

VB.NET is a OOP language by Microsoft. It evolved from Visual Basic 6 to meet an increasing need for easy web services, web development and windows applications.

~ 95 000 USD





JavaScript is the front end

~ 80.000 USD

0

7.6% C++ (1979)



C++ has been around for ages and there is no end gressive version of C, imperative, object-oriented and used for OSs, embedded Systems like applian-

~ 100.000 USD



3.7% C# (2000)



C# was Microsoft's nes the best of C++ with Visual Basic. It is a highly flexible language, mostly used for building windows desktop applications.

~ 90.000 USD



2.3% SQL (1986)



SQL (Structured Query Language) is a language aimed to store, manipulate, and query data, stored in relational databases. It is widely used in business and other types of database administration.

WEB DEVELOPMENT





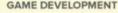






















MOBILE APP DEVELOPMENT







DATA ANALYSIS





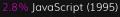
EMBEDDED SYSTEM PROGRAMMING













language for creating interactive websites and user interfaces. With libraries like Angular, React, or

02 Algorithm





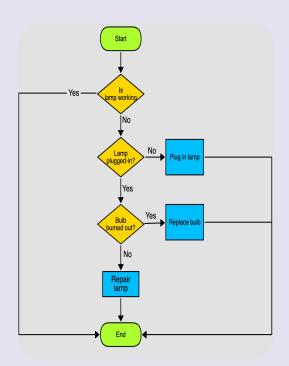
What is an algorithm?

A computer algorithm is a set of defined, ordered, and bounded instructions for solving a problem, performing a computation, or carrying out a task. In other words, an algorithm is a step-by-step procedure to achieve an end. Starting from an initial state and information, a series of ordered steps are followed to arrive at the solution of a situation.

In programming, an algorithm is the step prior to writing code. First we must find the way to obtain the solution to the problem (define the computer algorithm), and then, through the code, we can tell the machine what actions we want it to carry out.



Example



HOW TO BAKE A CAKE?

- 1) Preheat the oven
- 2) Gather the ingredients
- 3) Measure out the ingredients
- 4) Mix together the ingredients to make the batter
- 5) Grease a pan
- 6) Pour the batter into the pan
- 7) Put the pan in the oven
- 8) Set a timer
- 9) When the timer goes off, take the pan out of the oven
- 10) Enjoy!





Exercises

Define the steps for the following situations.

- Performing a hamburger
- Writing an article
- Choosing 3 different random numbers from 1 to 10.





Making a hamburger



Making a hamburger

Turn on the grill

- 2. Prepare the meat and flatten it.
- 3. Put the meat on the grill and wait for it to cook.
- 4. Wash and slice
 - a. Lettuce
 - b. Tomato
 - c. Avocado
 - d. Pickle
 - e. Cheese
- 5. Put mayonnaise and mustard on the bread.
- 6. Add the cooked meat at the base of the bread.
- 7. Add the cheese, lettuce, tomato, avocado and pickles on top of the meat.
- 8. Place the top of the bread on top of the ingredients.





Write an article

Exercise

- 1. Choose a title
- 2. Search for sources on the topic
- 3. Writing the introduction
- 4. Writing the content
 - a. Initial or main idea
 - b. Development of the idea or theme
- 5. Write conclusion
- 6. Review structure and spelling
- 7. Proofreading
- 8. Article publication





Choice 3 different random numbers from 1 to 100



Choice 3 different random numbers from 1 to 100

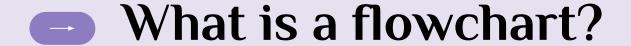
- 1. Choose a number from 1 to 10.
- 2. Write down the number
- 3. Choose another number from 1 to 10.
- 4. Verify that the number is not repeated.
 - a. If it is repeated, choose another number until it is different.
- 5. Write down the number
- 6. Choose another number from 1 to 10.
- 7. Verify that the number is not repeated.
- a.If it is repeated, choose another number until it is different
- 8. Write down the number
- 9. Display the list of the randomly selected numbers.







03 Flowcharts

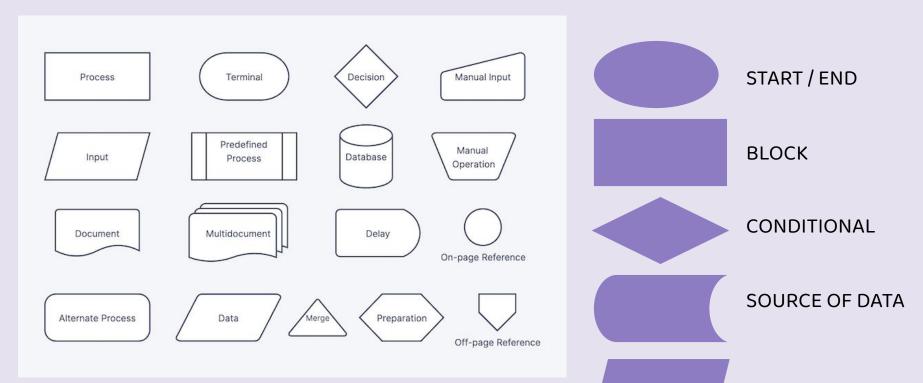


A flowchart is a diagram that describes a process, system or computer algorithm. They are widely used in numerous fields to document, study, plan, improve, and communicate often complex processes in clear, easy-to-understand diagrams.

Flowcharts use rectangles, ovals, diamonds and numerous other shapes to define the type of step, along with connecting arrows that establish the flow and sequence.



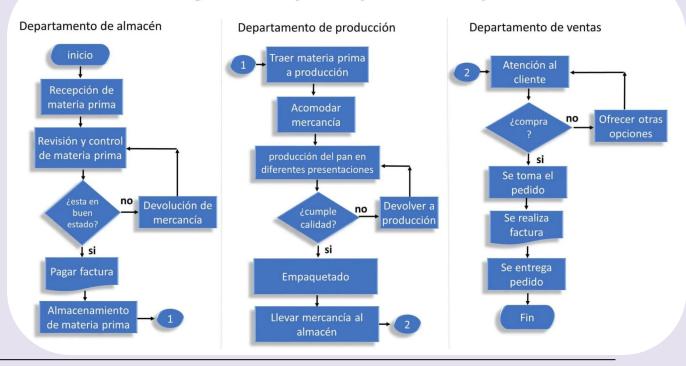
Parts of a flowchart



INPUT / OUTPUT

Flowchart

Diagrama de flujo en la producción de pan

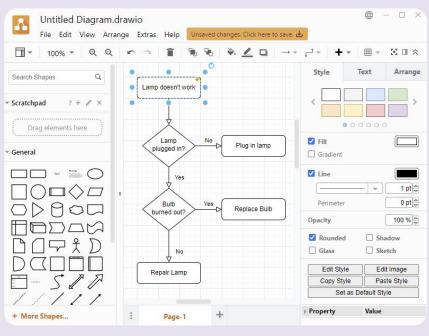




Random selection of 3 different numbers

<u>draw.io</u>







Random selection of 3 different numbers

- 1. Choose a number
- 2. Is it a different number?

YES: Step

NO: Step

- 3. Write down the number
- 4. Do you have the 3 different numbers?

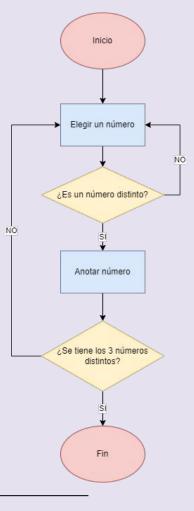
YES: Step

NO: Step

5. End of algorithm

Notes:

- Step 1 through 2 is repeated only if any duplicate numbers are repeated.
- Step 1 through 4 is repeated until you have 3 different numbers.





Basic Sentence





Declaration

This type of statement inserts one or more identifiers in a block.



Conditional

The conditional statement evaluates a condition to determine the action to be executed.



Iteration or loop

Las sentencias de iteración permiten repetir un conjunto de sentencias ejecutando un bucle.

Basic Sentence - Examples





Declaration

Gravity is equal to:
9.8 m/s^2
Gravity = 9.8
Unit = m/s^2



Conditional

Is the sun still shining?
YES:
Then it is daytime
NO:
Then it is night



Iteration or loop

Repeat until: Condition \rightarrow Pass test Action \rightarrow Perform exam (Optional) Max attempts \rightarrow 10