

# Introduction to Programming

## Section II



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# 01 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



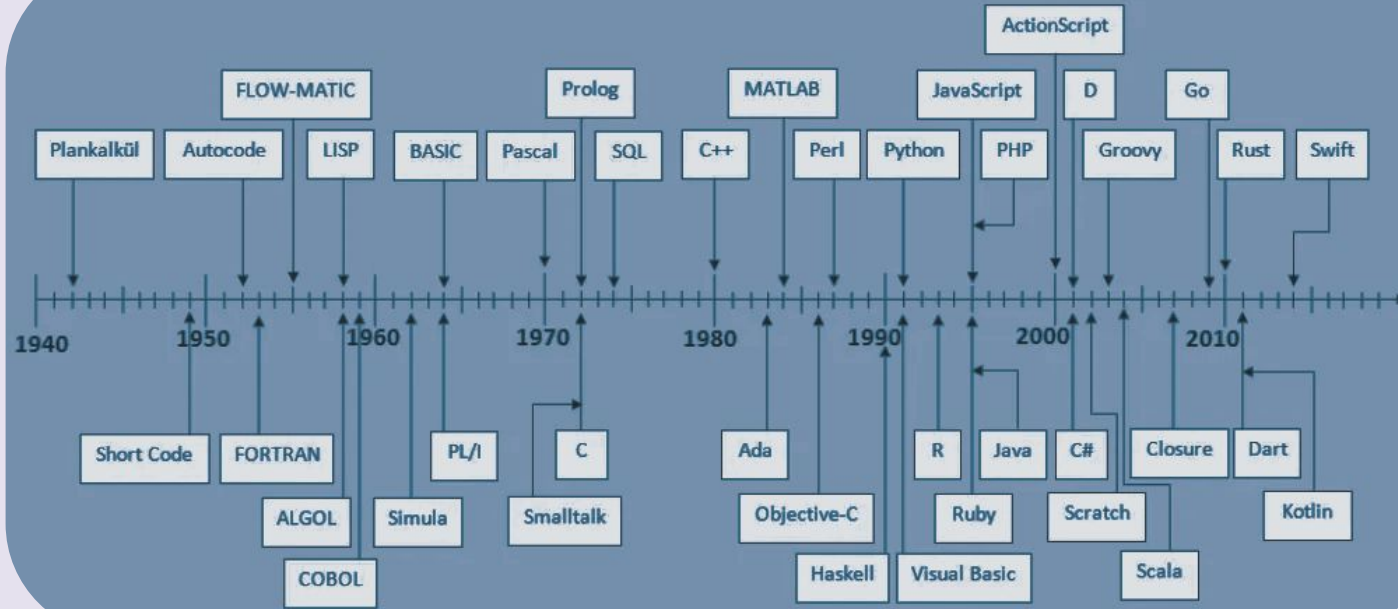


# What is programming?





# Timeline



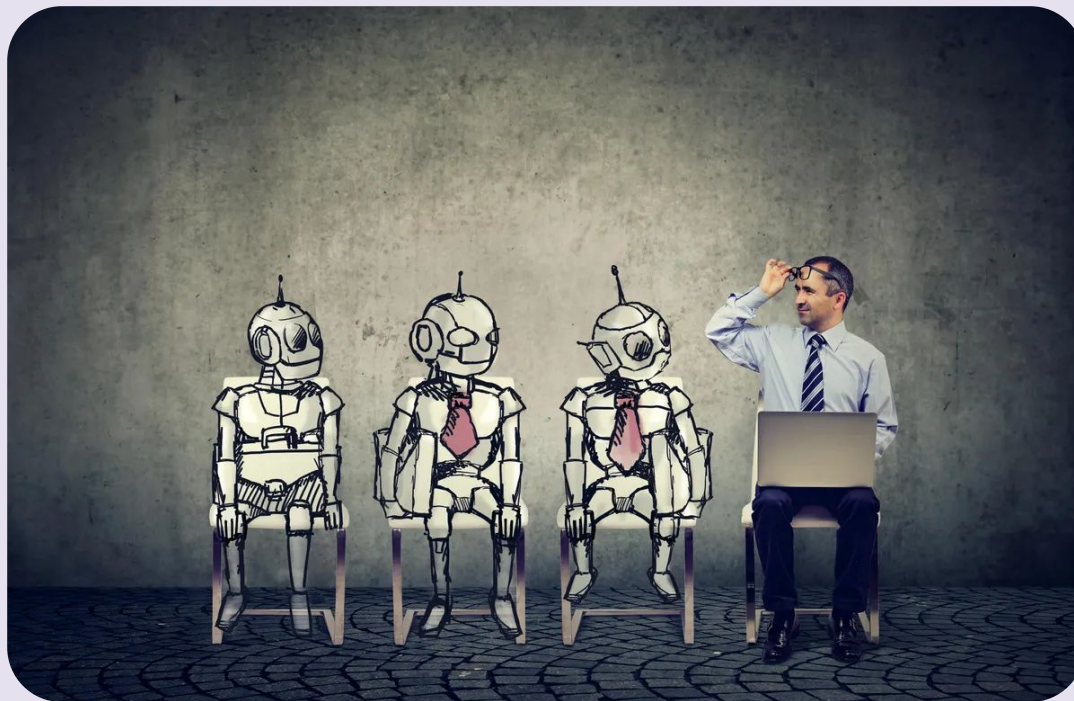
# → Why is it important?

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



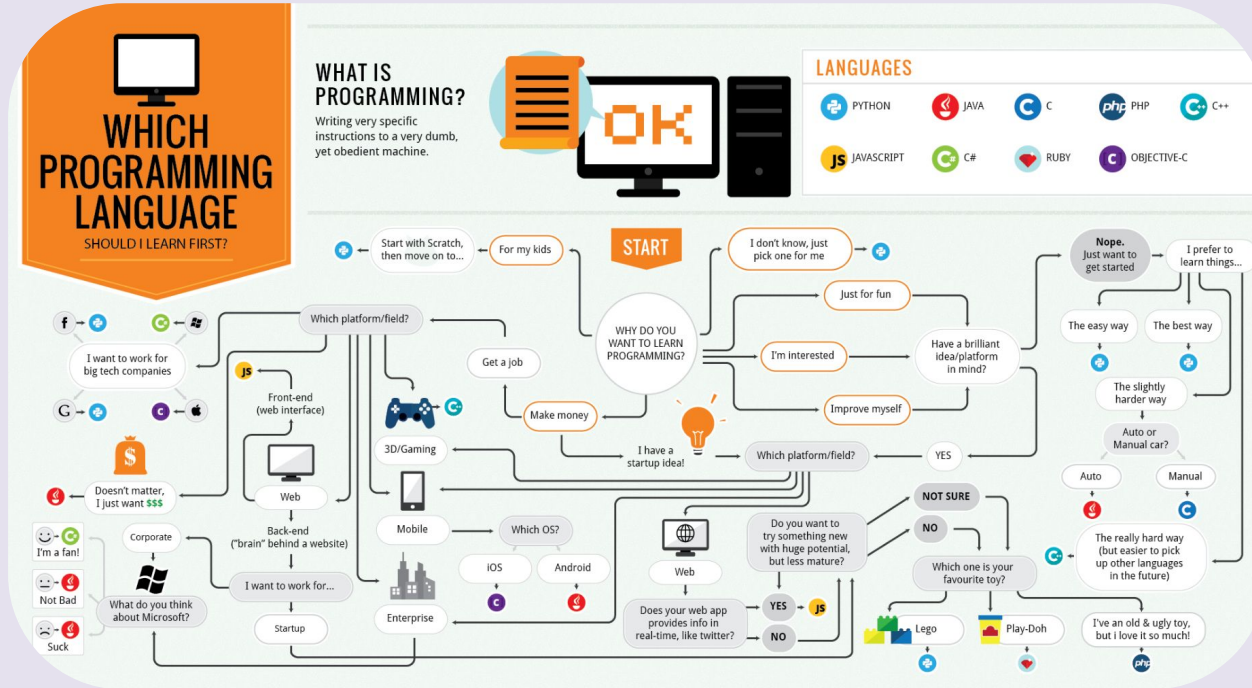


# Dilema

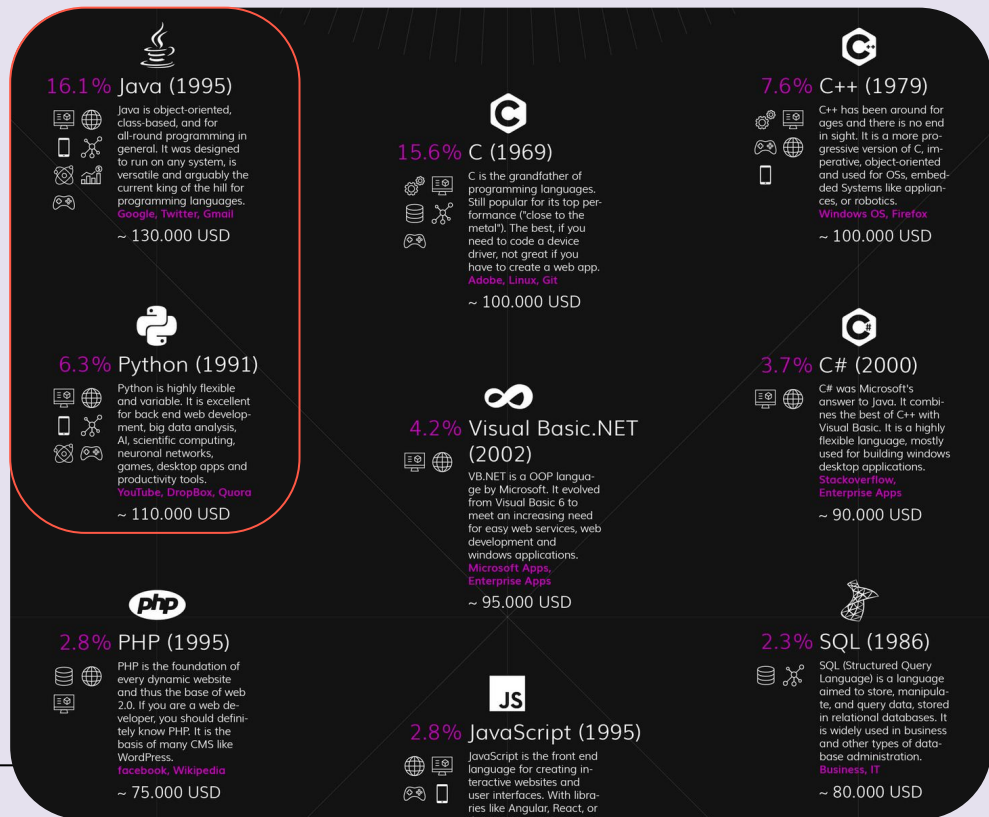




# Areas of use



# Areas of use



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# 02

## Algorithm





# What is an algorithm?

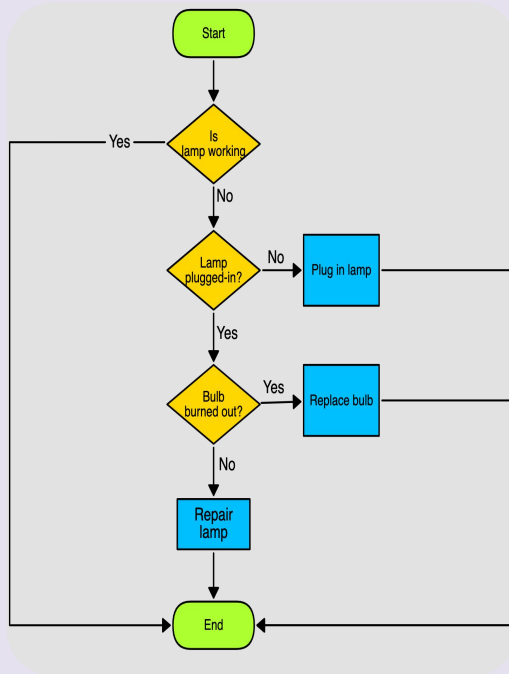
A **computer algorithm** is a **set of defined, ordered, and bounded instructions** for **solving a problem**, performing a computation, or carrying out a task. In other words, an algorithm is a step-by-step procedure to achieve an end. Starting from an initial state and information, a series of ordered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



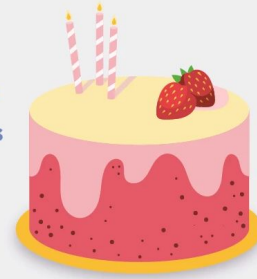


# Example



## 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.





# Exercises

**Making a hamburger**

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# Exercise

## 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.







# Exercise

**Write an article**

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# 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

headline

body text

byline

picture

caption

date

masthead



## Jimmy Carter, oldest ex-president, leads as a human rights champion

By Marylou Tousseignant, Washington Post, adapted by Newsela staff on 10.09.19  
Word Count 680  
Level MAX



Image 1: Former President Jimmy Carter (center) has worked with Habitat for Humanity for more than 30 years. The organization builds houses for low-income people there. Carter helps at a Habitat project in Washington, D.C., in October 2010. Photo by: Marvin Joseph/The Washington Post

Get out the birthday candles. Former President Jimmy Carter turned 95 on October 1.

Carter is the first former president to reach that milestone. His one-term presidency ended in 1981, when he was 56 years old, meaning he also has been an ex-president longer than anyone else in U.S. history — nearly 39 years.



# Exercise

**Choice 3 different random numbers from 1 to 100**

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# Exercise

## **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

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# What is a flowchart?

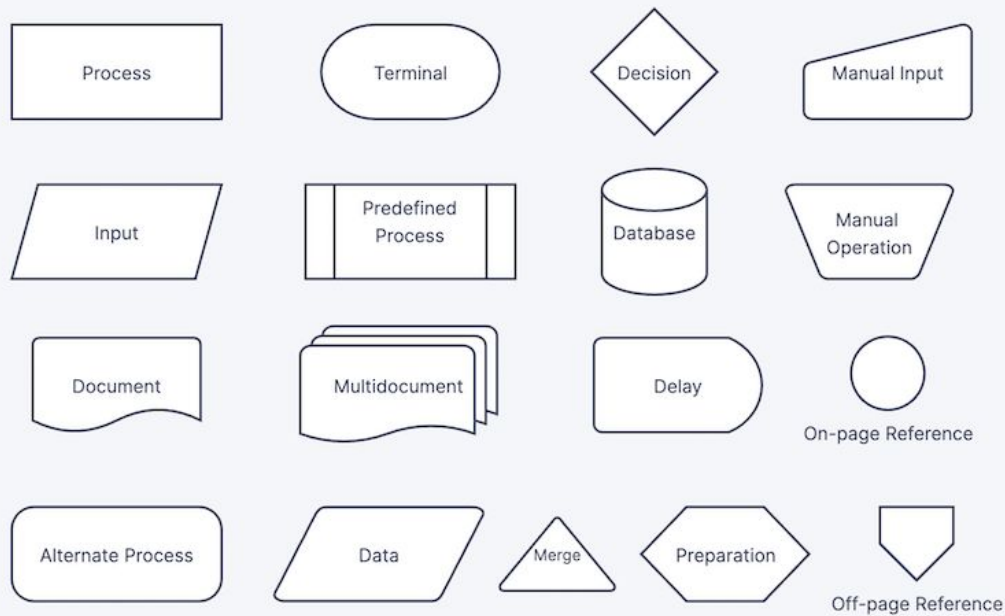
**A flowchart is a diagram that describes a process, system or computer algorithm.** They are widely used in numerous fields to document, study, plan, improve, and communicate often complex processes in **clear, easy-to-understand** diagrams.

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.





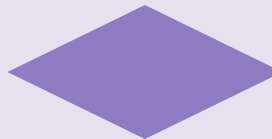
# Parts of a flowchart



START / END



BLOCK



CONDITIONAL



SOURCE OF DATA



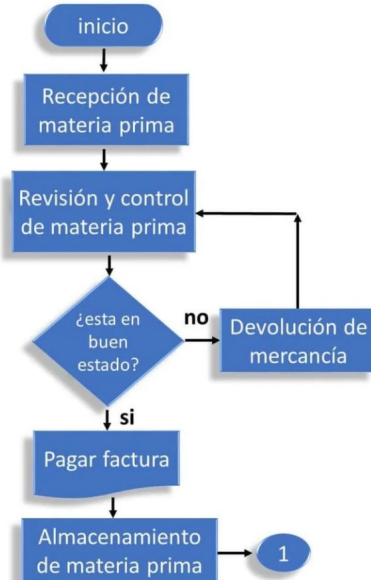
INPUT / OUTPUT



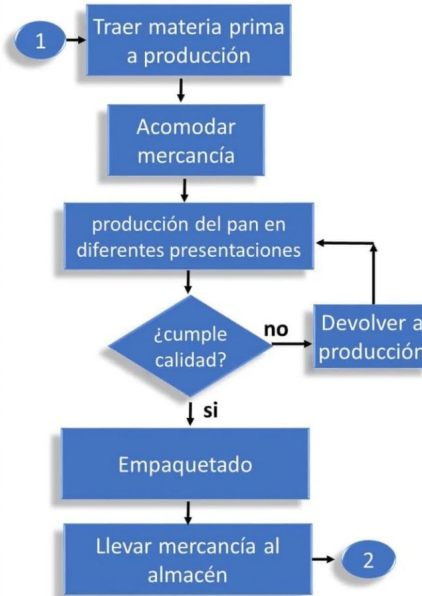
# Flowchart

## Diagrama de flujo en la producción de pan

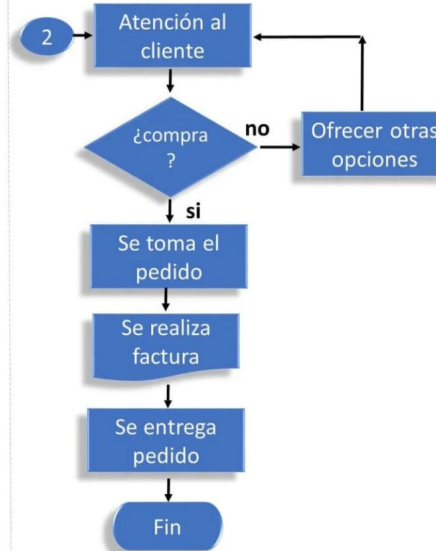
### Departamento de almacén



### Departamento de producción



### Departamento de ventas



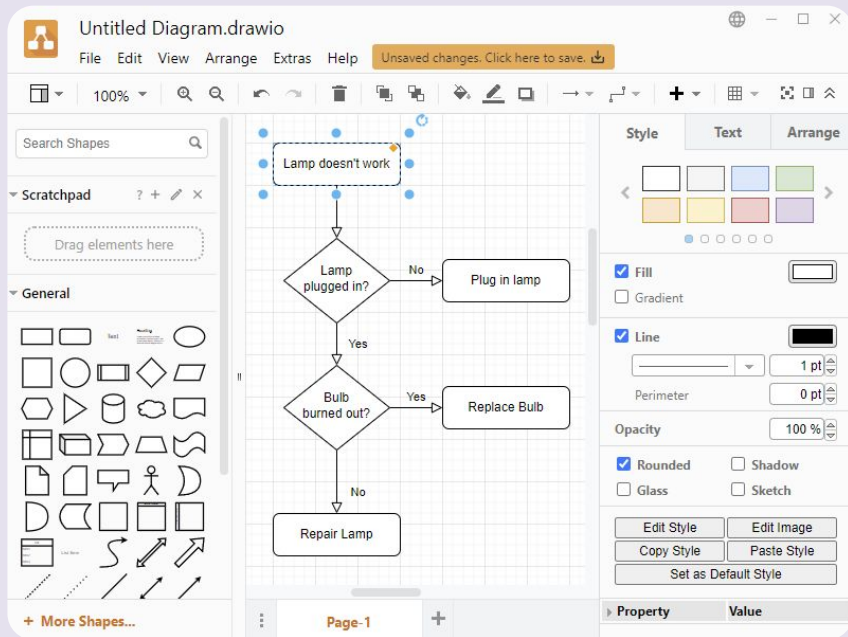
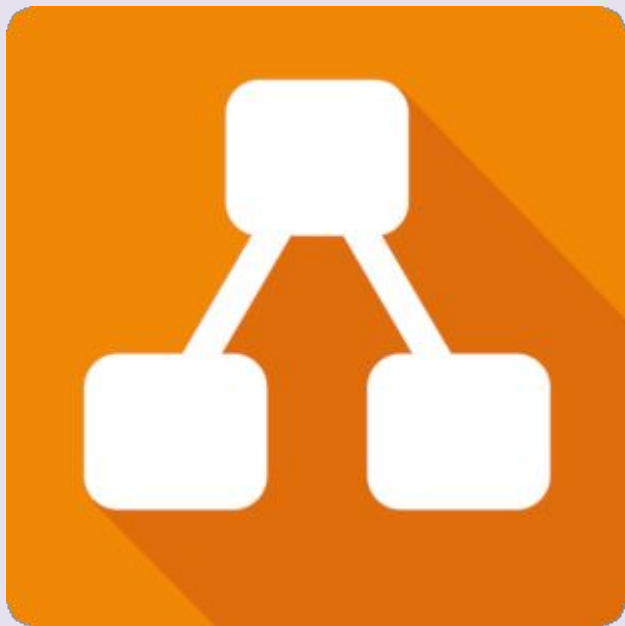




# Exercise

Random selection of 3 different numbers

draw.io





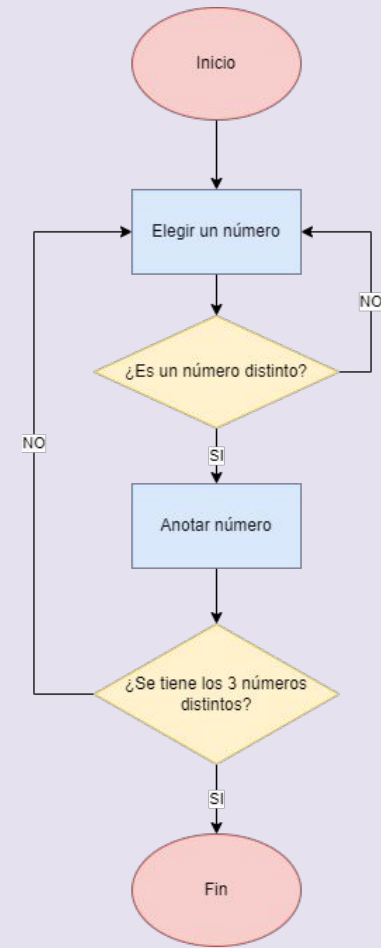
# Ejercicio

## 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.



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# 04 Sentences



# 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 → Pass test  
Action → Perform exam  
(Optional)  
Max attempts → 10
```