Algorithm and Flowchart

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Algorithm

- Algorithm is a step – by – step procedure which is helpful in solving a problem.
- If, it is written in English like sentences then, it is called as ‘PSEUDO CODE’.
- An algorithm is a finite set of instructions, if followed and accomplishes a particular task.
- It is a sequence of computational steps that transform the input into a valuable or required output.

Properties of an Algorithm

- An algorithm must possess the following five properties −
    - Input
    - Output
    - Finiteness
    - Definiteness
    - Effectiveness

1. Input: An algorithm should have some inputs.

2. **Output:** At least one output should be returned by the algorithm after the completion of the specific task based on the given inputs.

3. **Definiteness:** Every statement of the algorithm should be unambiguous.

4. **Finiteness:** No infinite loop should be allowed in an algorithm.

Example:

```
while(1<2)
{
        number=number/2;
}
```

5. **Effectiveness:** Writing an algorithm is a **priori process** of actual implementation of the algorithm. So, a person should analyze the algorithm in a finite amount of time with a pen and paper to judge the performance for giving the final version of the algorithm.

Algorithm 1: Add two numbers entered by the user

```
Step 1: Start
Step 2: Declare variables num1, num2 and sum.
Step 3: Read values num1 and num2.
Step 4: Add num1 and num2 and assign the result to sum.
        sum←num1+num2
Step 5: Display sum
Step 6: Stop
```

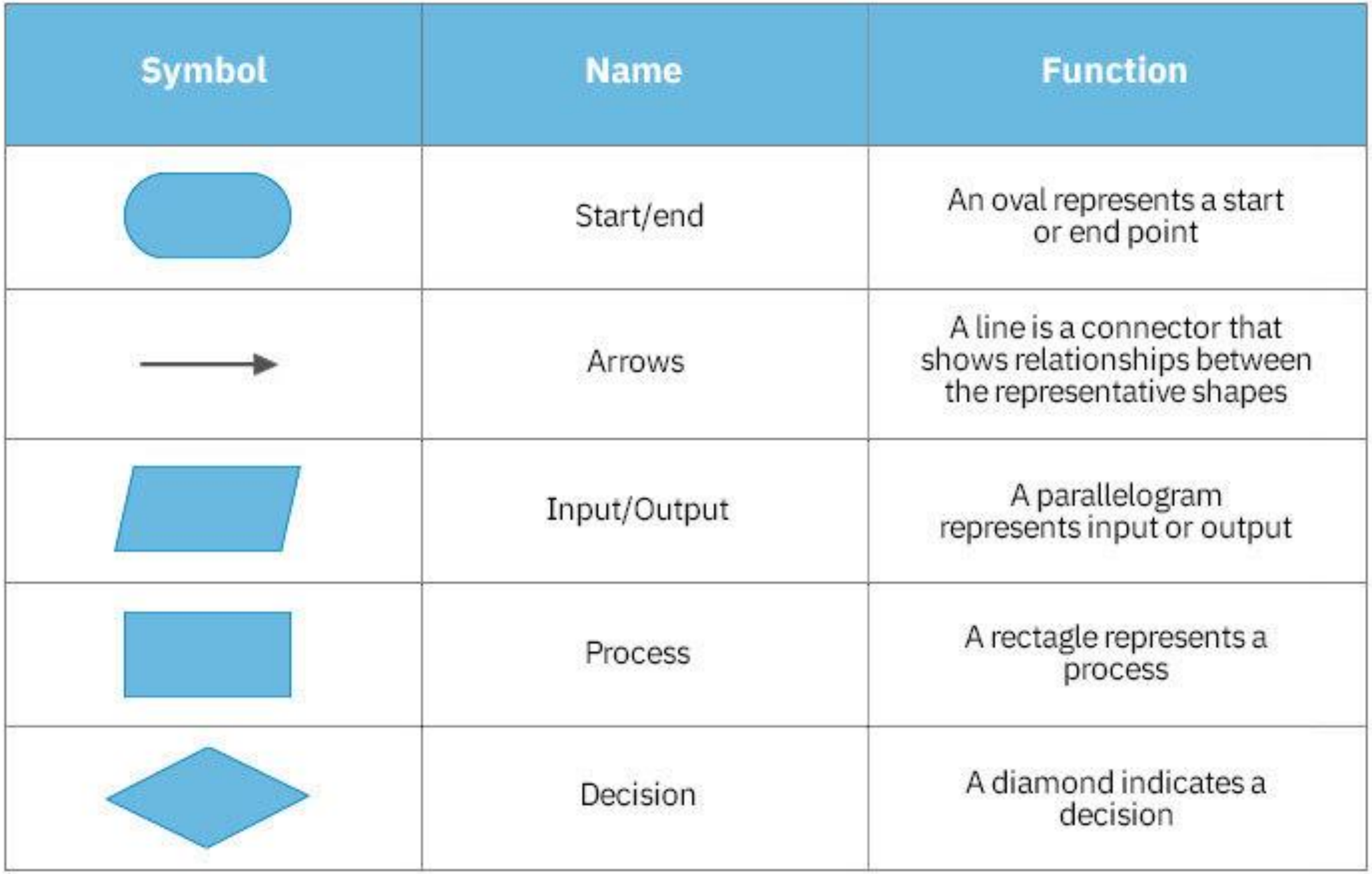
Algorithm 2: Find the largest number among three numbers

```
Step 1: Start
Step 2: Declare variables a,b and c.
Step 3: Read variables a,b and c.
Step 4: If a > b
          If a > c
            Display a is the largest number.
          Else
            Display c is the largest number.
        Else
          If b > c
            Display b is the largest number.
          Else
            Display c is the greatest number.
Step 5: Stop
```

FLOW CHART

- Diagrammatic representation of an algorithm is called flow chart.
- A flowchart can be helpful for both writing programs and explaining the program to others.

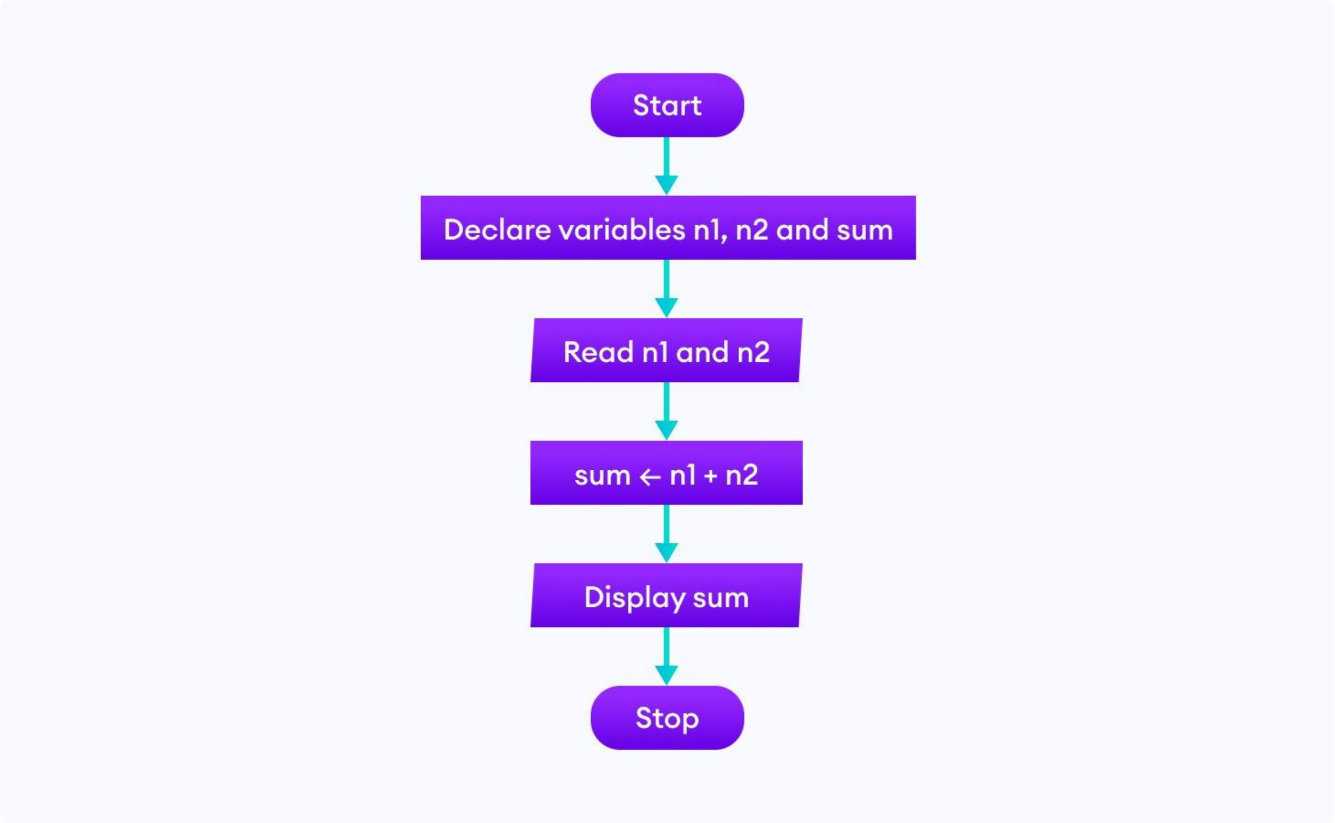
Symbols Used In Flowchart



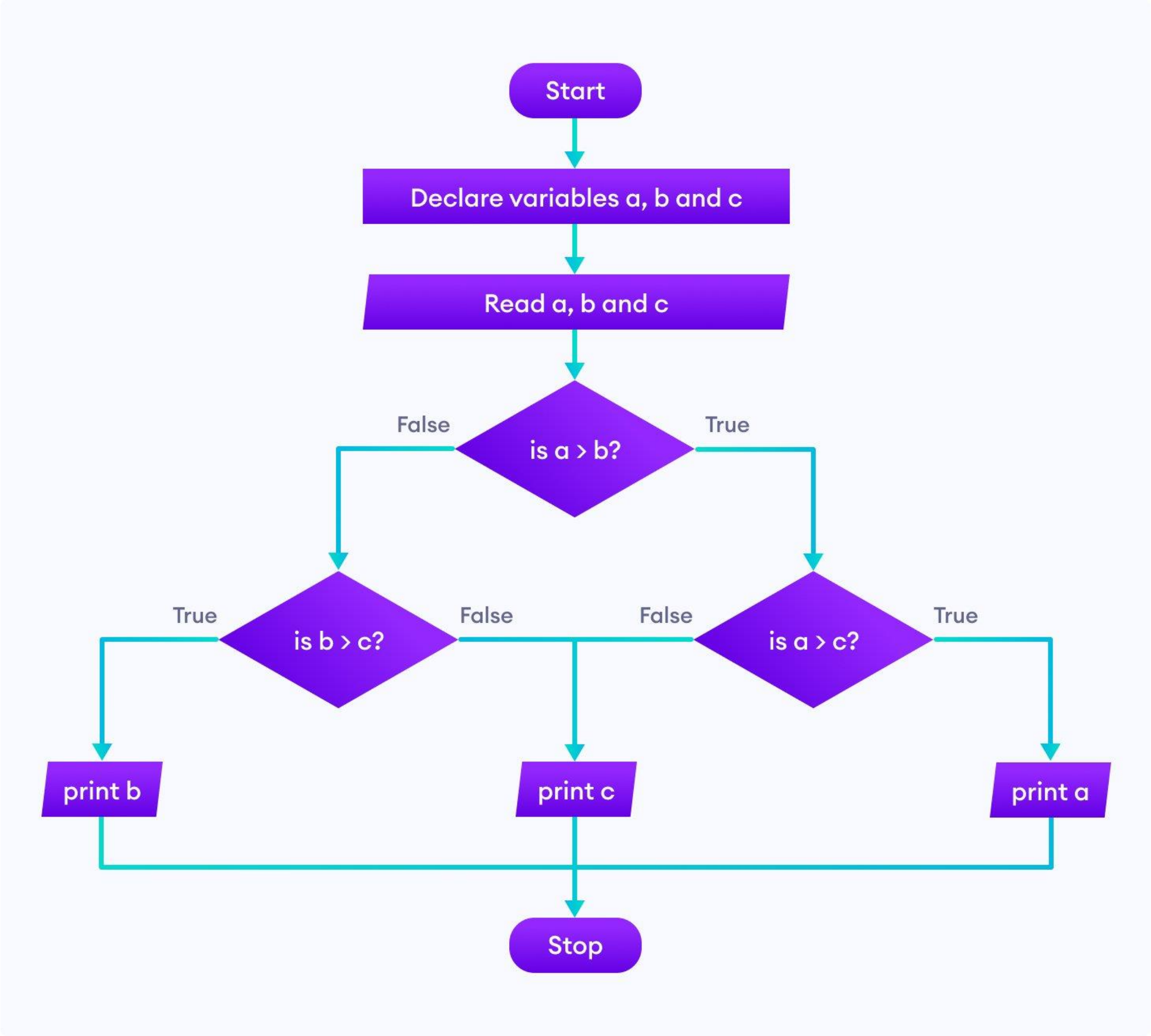
Symbol	Name	Function
⬭	Start/end	An oval represents a start or end point
→	Arrows	A line is a connector that shows relationships between the representative shapes
▱	Input/Output	A parallelogram represents input or output
▭	Process	A rectagle represents a process
◆	Decision	A diamond indicates a decision

Examples of flowcharts in programming

1. Add two numbers entered by the user.



2. Find the largest among three different numbers entered by the user.



Difference Between Algorithm & Flowchart

Algorithm

- It is defined as a sequence of well-defined steps.
- These steps provide a solution/ a way to solve a problem in hand.
- It gives the solution to a specific problem.
- This solution would be translated to machine code, which is then executed by the system to give the relevant output.
- It is difficult to understand.
- It is easy to debug.

Flowchart

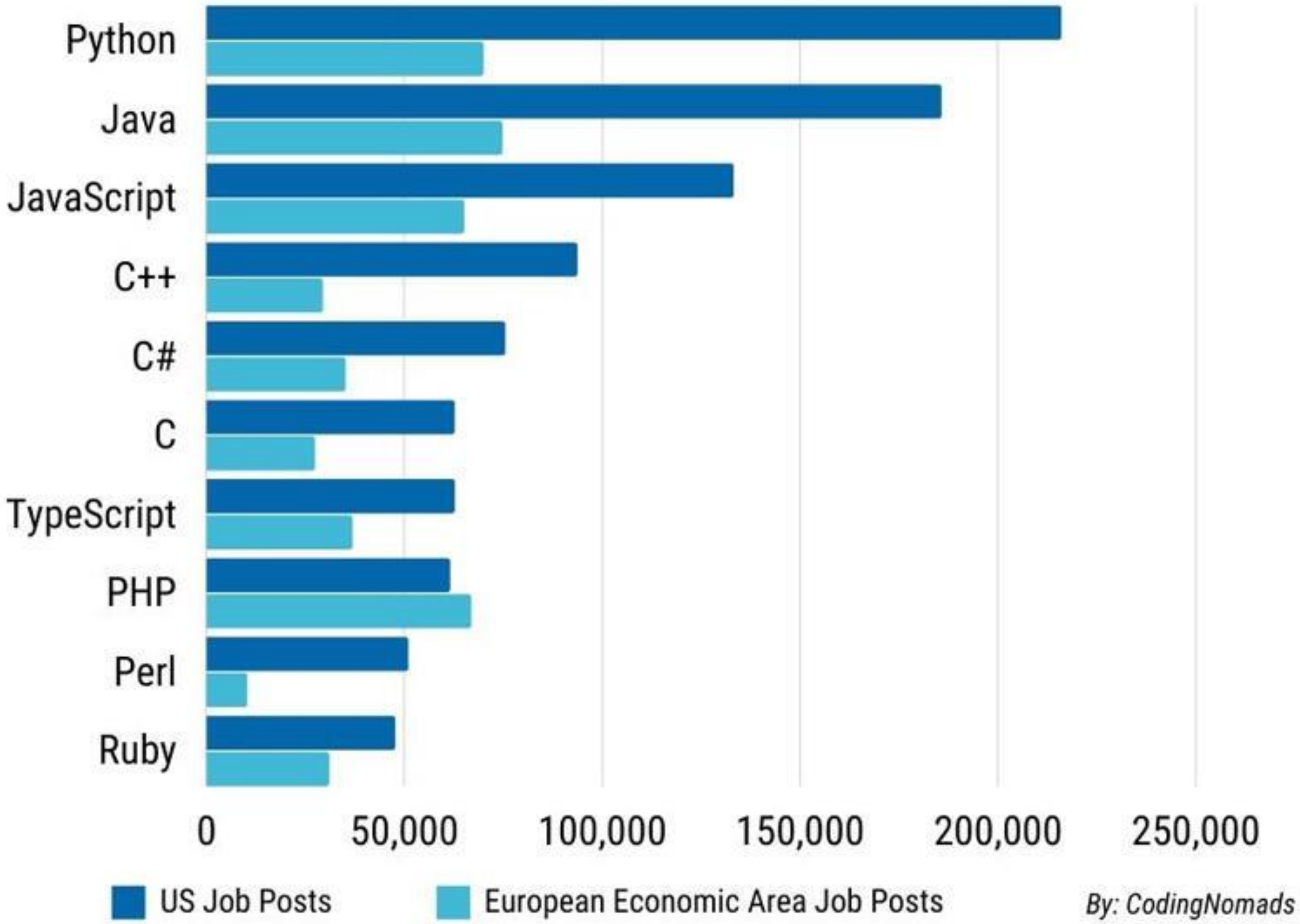
- It is a graphical representation of an algorithm.
- Programmers use it as a program-planning tool in order to solve a problem.
- This will help indicate the flow of control and information, and processing.
- The process of drawing a flowchart for an algorithm is known as "flowcharting".
- It is easy to understand.
- It is difficult to debug.

Programming Language

- A programming language is a vocabulary and set of grammatical rules for instructing a computer or computing device to perform specific tasks.
- The term *programming language* usually refers to high-level languages, such as BASIC, C, C++, COBOL, Java, FORTRAN, Ada, and Pascal.
- Each programming language has a unique set of keywords (words that it understands) and a special syntax for organizing program instructions.

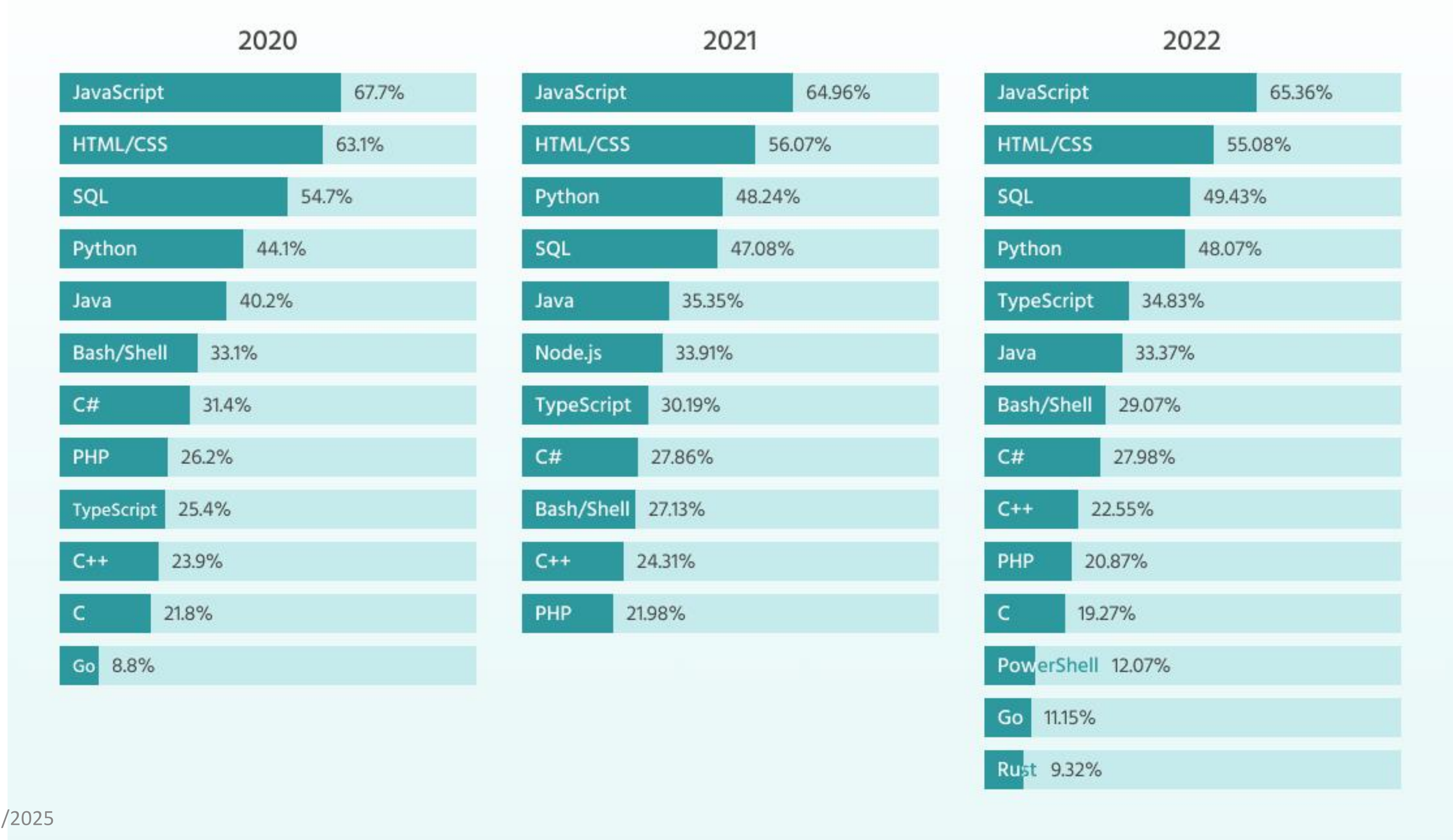
Most in-demand programming languages of 2022

Based on LinkedIn job postings in the USA & Europe



By: CodingNomads

Top Programming, scripting, and markup languages



Thank you !!