DOCENTE	Shadi Lahham
Corso	Web Developer
Unità Formativa	Programmazione - Javascript e Typescript
Argomento	Specificato nel titolo della slide successiva

Javascript

Language introduction

Shadi Lahham - Web development

Language

Javascript

- A programming language used to make web pages interactive
- Runs **client-side** in the visitor’s browser
    - Client-side code is code that runs on the user's computer
- Responsible for the "behavior" of a Website
- Constitutes the third layer of the standard web technologies layer cake, alongside HTML and CSS

Javascript

JavaScript allows you to implement complex things on web pages such as

- Updating website content (e.g. news updates)
- Interactive maps
- Drawing and animation
- Image galleries and lightboxes
- Full featured web applications
- Keep track of users with cookies
- Interactive elements like tabs, sliders and accordions

Node.js

- Node.js is a platform built on Chrome's JavaScript runtime for easily building fast and scalable network applications
- Node.js runs **server-side**. Server-side code runs on the server, then its results are downloaded and displayed in the browser
- Node.js uses an event-driven, non-blocking I/O model that makes it lightweight and efficient, perfect for data-intensive real-time applications that run across distributed devices

Compiled & interpreted languages

Compiled & interpreted languages

- Interpretation and compilation are characteristics of how a language is implemented
- It's incorrect to categorize a language as solely interpreted or compiled because these processes depend on the implementation rather than inherent properties of the language
- Therefore, any language could potentially be interpreted or compiled, depending upon the specific implementation being utilized

What exactly is compilation?

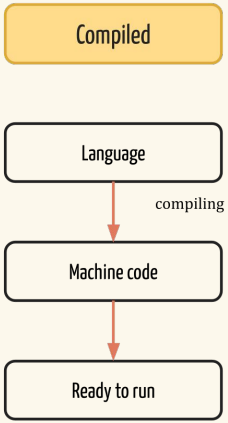
- In the compiled execution of a programming language, the compiler converts the program directly into machine code tailored to the target machine, referring to code designed for a particular processor and operating system
- Subsequently, the computer independently executes this machine code.

What exactly is interpretation?

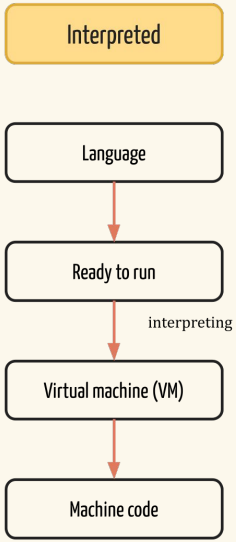
- In an interpreted implementation, the source code isn't directly run by the machine. Instead, another program, known as the interpreter, reads and executes it
- This interpreter is tailored for the native machine
- For example, when encountering the "*" operation, the interpreter calls its own "multiply(x,y)" function, which then executes the machine code's equivalent instruction

Too many words!

Compiled vs interpreted languages



Examples of compiled languages
C, C++, Fortran, Pascal



Examples of interpreted languages
Python, PHP, Ruby, Javascript

Comparison

Interpreted

Requires interpreter

Interpreted on the fly

Platform independent

Compiled

Requires compiler

Depends on platform

Slow compilation

Interpreted: advantages & disadvantages

Advantages

- Easy to learn and use
- More portable
- Allow complex tasks to be performed in relatively few steps
- Allow simple creation and editing in a variety of text editors
- Allow the addition of dynamic and interactive activities to web pages
- Editing and running of code is fast

Interpreted: advantages & disadvantages

Disadvantages

- Usually run slower
- Limited access to low level and speed optimization code
- Limited commands to run detailed operations on graphics
- Limited access to the device

Compiled: advantages & disadvantages

Advantages

- Fast execution
- Optimised for the target hardware

Disadvantages

- Require a compiler
- Editing and deploying the code is a lot slower than interpreters

Compiled & interpreted error handling

Compiled Languages

- Errors caught at compile time: syntax, type mismatches
- Reduces runtime errors
- Logic errors discovered during runtime
- Errors less likely to affect end-users if thoroughly tested

Interpreted Languages

- Errors exposed at runtime due to direct execution, not compilation
- Runtime-dependent behavior: environment variations like browsers, OS
- Low-probability errors harder to replicate without extensive testing
- Untested runtime errors often affect end-users directly

Your turn

1.Languages

- Make a list of all the programming languages that you know
- Classify the languages into the groups: compiled, interpreted, other
- For each language, explain why it is compiled, interpreted or other
- Try to find additional programming languages and add them to the list

Create a folder named **01-languages**

Inside the folder create a **.txt** or **.doc** or **.md** file with your answers

Note: all files should be in kebab-case (italiano)

2.Levels

Read the following articles and write a short summary in Italian or English

- Compiler and Interpreter Critical Differences
- Levels of Programming Languages
- **Bonus** Machine Language vs. Assembly Language

Create a folder named **02-levels**

Inside the folder create a **.txt** or **.doc** or **.md** file with your answers

Note: all files should be in kebab-case (italiano)

© Copyright & Attribution