

Practical Programming

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Introduction

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<http://www.debug-pro.com/epita/prog/s3/index.html>

Project

- Groups of four students only.
- 20-09-2019: Group submission
- 21-10-2019: First defense
- 02-12-2019: Final defense

Programming Style

- Indent your code.
- Stay coherent.
- Stay clear.
- Identifiers should be explicit and short.
- 80 columns are enough.

Optimization

- *“Make it right before you make it fast. Make it clear before you make it faster. Keep it right when you make it faster.”*
P.J. Plauger – The Elements of Programming Style
- *“We should forget about small efficiencies, say about 97% of the time: premature optimization is the root of all evil.”* Donald E. Knuth – Structured Programming with Goto Statements

Comments

- Even good code needs comments.
- Keep comments in sync with the code.
- Good comments are never a waste of time.

Main Types of Languages (1)

Compiled Languages

- The source code is not executed.
- It is used to generate native machine code that will be executed by the microprocessor.
- Examples: C, C++, Go, Rust

Interpreted Languages

- The source code is executed by an interpreter.
- No machine code is generated.
- Examples: JavaScript, PHP, Python

Main Types of Languages (2)

Be careful! These definitions are purely theoretical.

In practice, some interpreted languages can be compiled and vice versa.

There are also *bytecode-compiled* languages that are compiled in an intermediate bytecode language, which is not the native machine code of the microprocessor. This intermediate language is then interpreted or just-in-time compiled (Java, C#).

Main Types of Languages (3)

Low-Level Languages

- Closer to hardware.
- Little abstraction from memory management.
- Less safe.
- Development process is slower.
- Execution is faster.
- Usually compiled languages.

Main Types of Languages (3)

High-Level Languages

- Strong abstraction from hardware.
- Strong abstraction from memory management.
- Safer.
- Development process is faster.
- Execution is slower.
- Usually interpreted languages (but not only).

Main Types of Languages (4)

Low-Level

Less safe
More Control
Faster

Assembly C++

C

Usually Compiled

High-Level

Safer
Less control
Slower

Go Java

C#

Python Ruby

PHP JavaScript

Usually Interpreted

