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بسم الله الرحمن الرحيم

**MINISTRY OF HIGHER EDUCATION  
KABUL UNIVERSITY  
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1<sup>ST</sup> CLASS**

# **PROGRAMMING FUNDAMENTALS**

**INTERPRETER**

**INSTRUCTOR  
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PROGRAMMING FUNDAMENTALS



## What is an Interpreter?


An **interpreter** is a type of computer program that directly executes instructions written in a programming language **line by line**, without first converting the entire code into machine language.

It translates high-level language (like Python, Ruby, JavaScript) into machine code **at runtime**.



## How Interpreter Works

1. **Read one line (or statement)** of the program.
2. **Translate it** into machine-understandable instructions.
3. **Execute it immediately.**
4. Move to the next line, and repeat until the program ends.



Unlike a **compiler** (which translates the whole code before execution), an interpreter works **step by step**.



# Features of Interpreter

- Executes **line by line**.
- Easier for **beginners** (errors show immediately).
- Slower than compilers (because translation happens during execution).
- More flexible for **scripting, testing, debugging**.

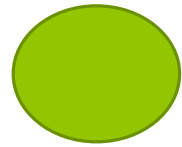


## Examples of Interpreted Languages

- **Python**
- **Ruby**
- **JavaScript**
- **PHP**
- **Perl**
- **MATLAB**

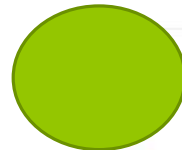


Each of these typically uses an interpreter to run programs.



## Advantages of Interpreters

- ✓ Easier debugging (errors show instantly).
- ✓ Portable (no need to recompile for different systems).
- ✓ Good for learning and experimenting.
- ✓ Useful for scripting tasks.



## Disadvantages of Interpreters

- ✗ Slower execution compared to compiled programs.
- ✗ Requires interpreter software installed on every machine.
- ✗ Less optimized for performance-heavy applications.


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## SOME DIFFERENCE INTERPRETER VS COMPILAR

Features	Interpreter	Compiler
Execution	Line by line	Whole program at once
Speed	Slower	Faster
Error detection	Immediately (per line)	After compiling whole program
Output	No separate file, run directly	Generates an executable file
Use case	Scripting, small apps, rapid testing	Large applications, performance critical software

NextIn short:

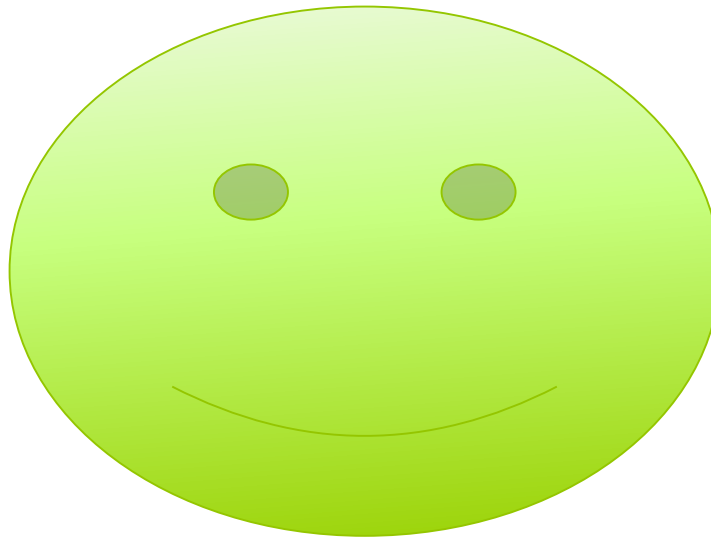
An **interpreter** is a program that **executes code line by line**, making it great for scripting, testing, and learning – but slower than compiled languages.

Thus interpreting is frequently used when developing & testing source code for new programs.



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# THANKS FROM YOUR ATTENTION



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