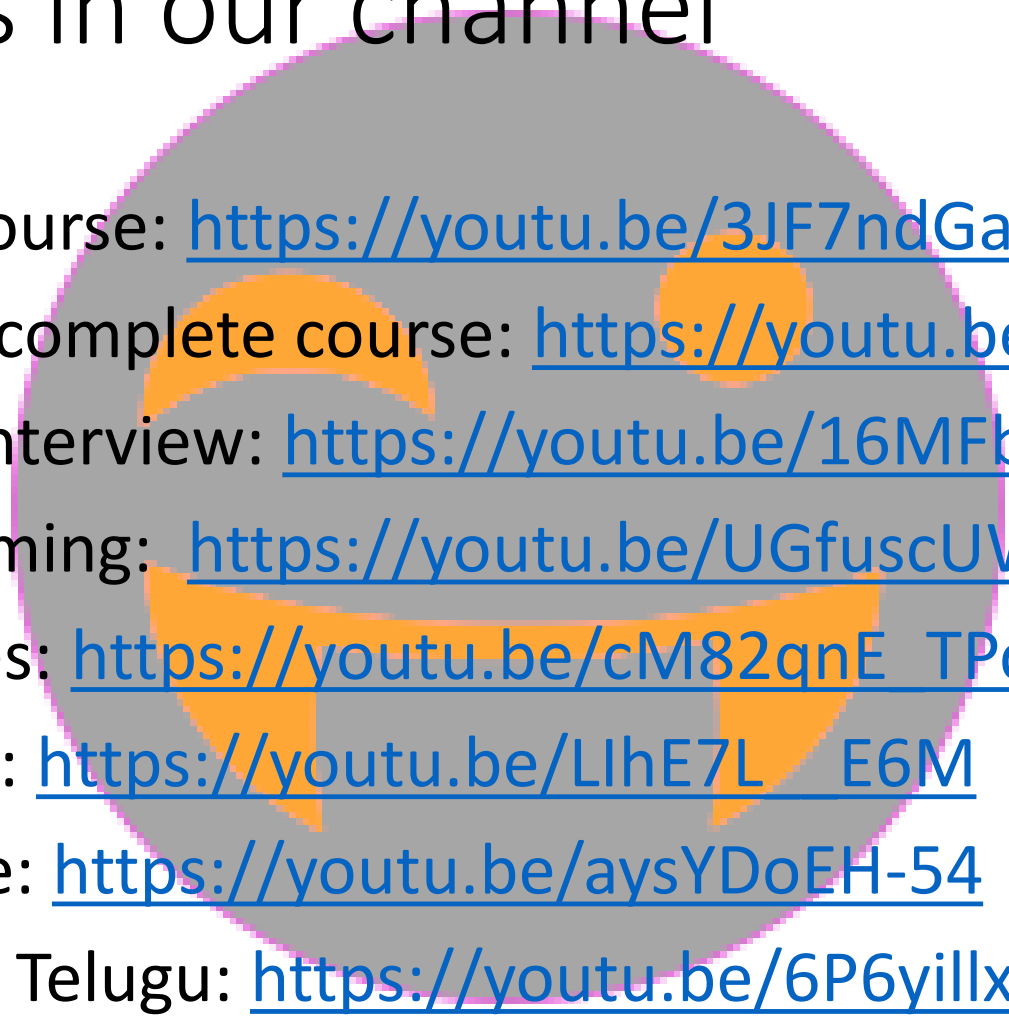
Chapter 6

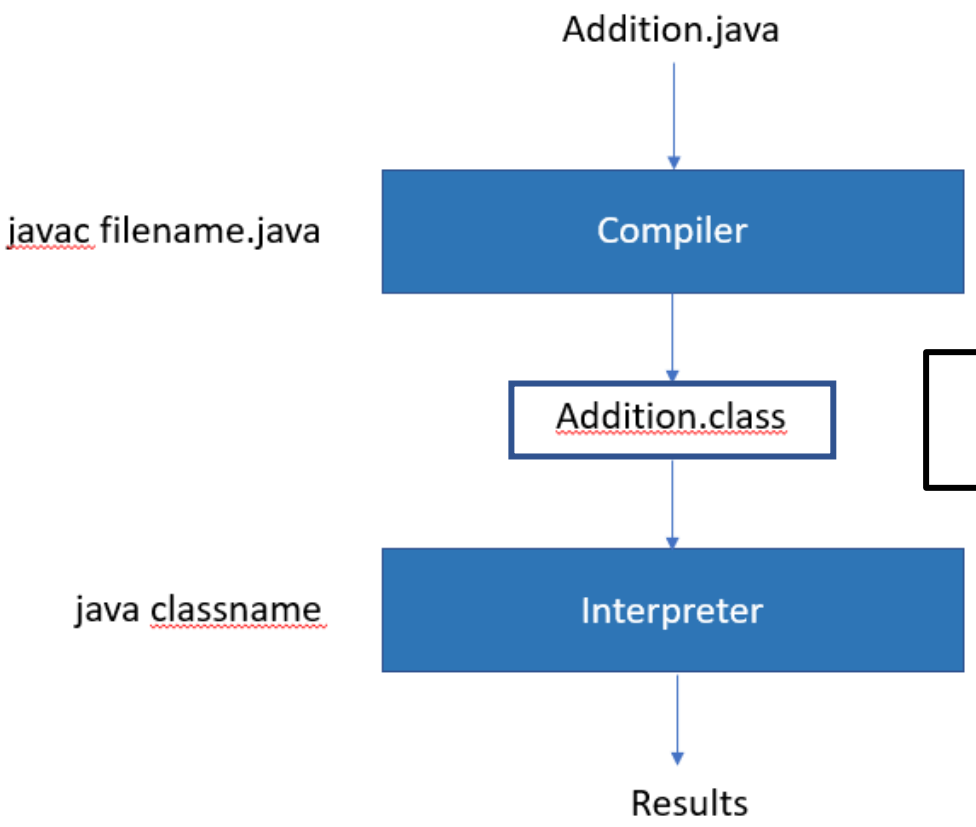
What is Platform Independence & How Java achieves it?

Other courses in our channel



- 👉 C 18 Hours Full course: https://youtu.be/3JF7ndGauZk
- 👉 Python 11 hours complete course: https://youtu.be/hXN0JBWIya8
- 👉 20 Programs for interview: https://youtu.be/16MFbFib7v8
- 👉 What is programming: https://youtu.be/UGfuscUWi-E
- 👉 Java in 10 minutes: https://youtu.be/cM82qnE_TPc
- 👉 Git Telugu course: https://youtu.be/LIhE7L__E6M
- 👉 Git English course: https://youtu.be/aysYDoEH-54
- 👉 HTML Full course Telugu: https://youtu.be/6P6yillxZY4

Executing a Java program




```java
import java.util.Scanner;
public class Addition{
public static void main(String args[]){
    Scanner scanner=new Scanner(System.in);
    System.out.println("Enter first number");
    int a = scanner.nextInt();
    System.out.println("Enter second number");
    int b = scanner.nextInt();
    int c = a+b;
    System.out.println("Addition is: "+c);
}
}
```

Platform independence is possible due to this byte code

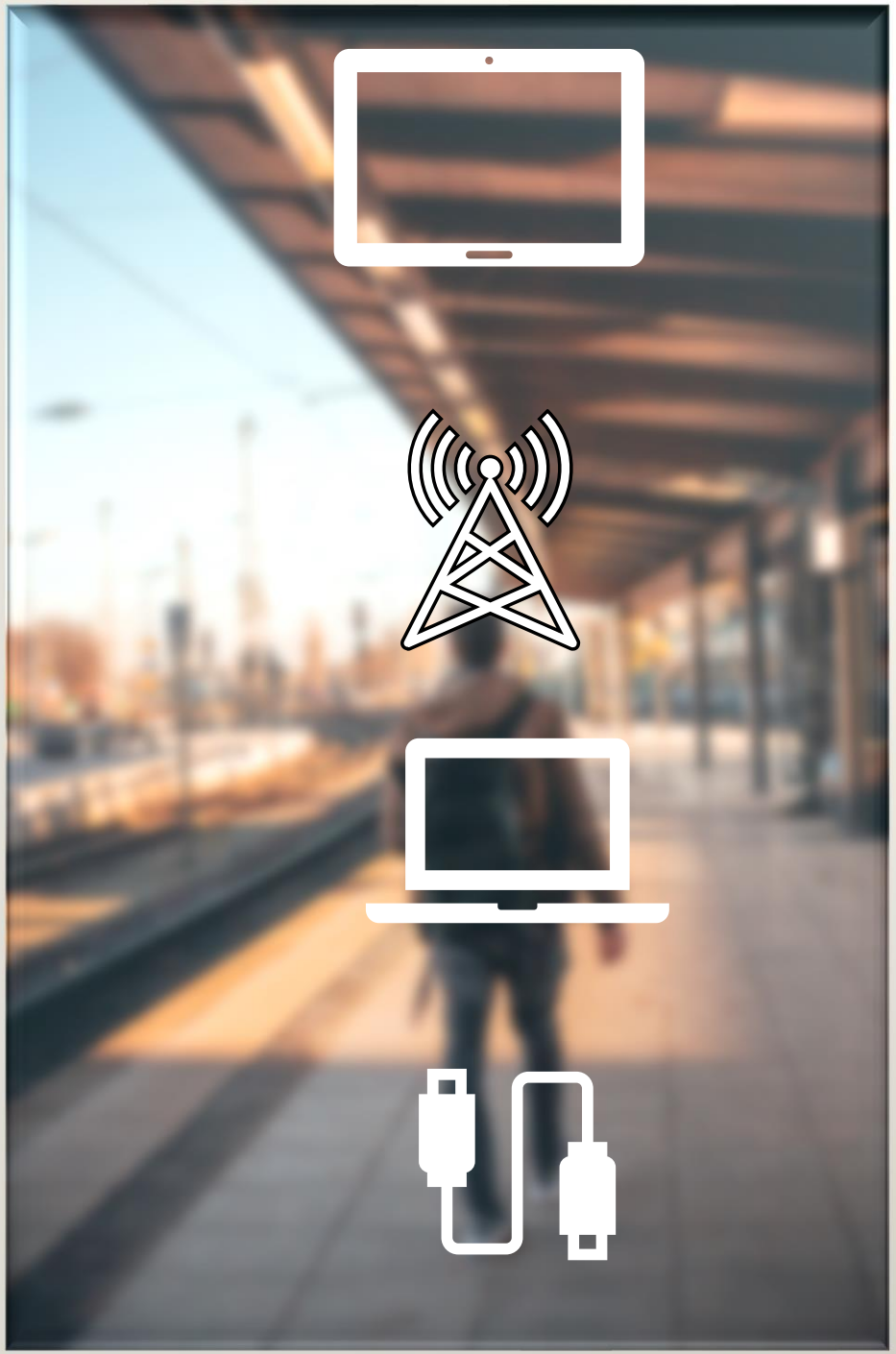
```
Enter first number
190
Enter second number
1999
Addion is: 2189
```

Platform

Hardware:
Silicon + plastic + iron + aluminium

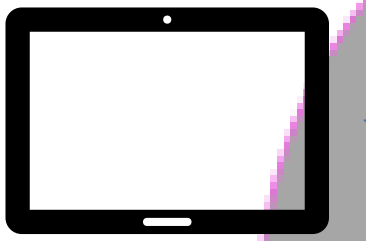
Software:
ios – iphone operating system

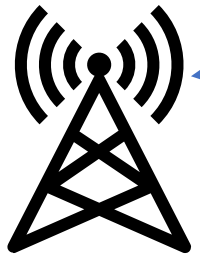
A platform is the hardware or software environment in which a program runs

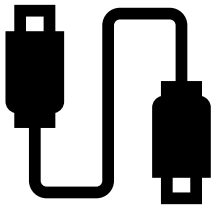


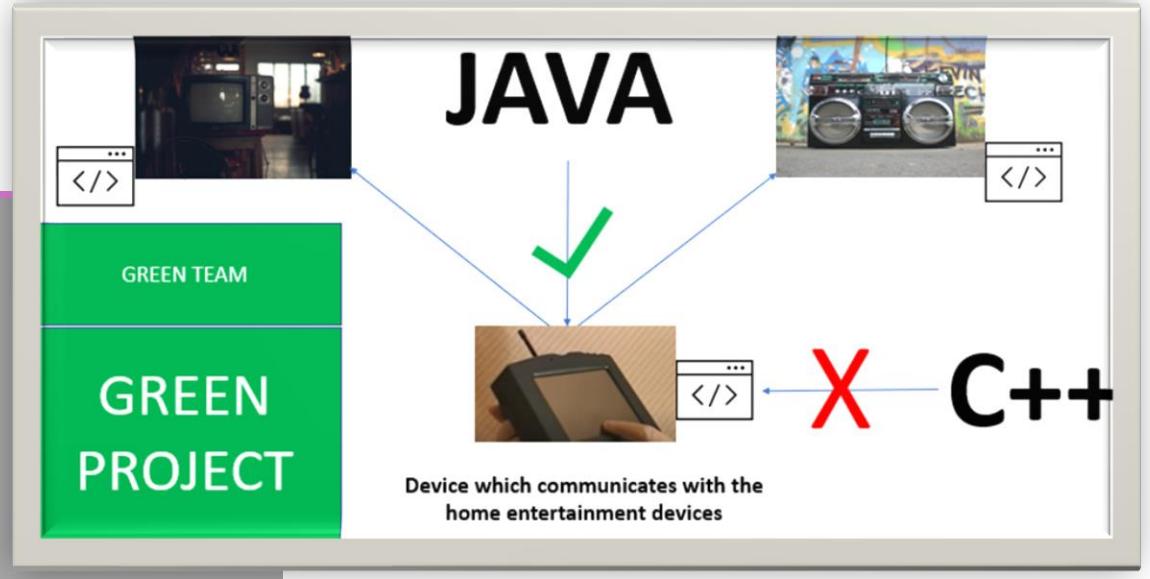
Independence

Platform Independence









Why C++ doesn't support Platform Independence

What happened earlier?

Scientists come with new language called high level language(C, C++, Java) which uses English like words

```
import java.util.Scanner;
public class Addition{
public static void main(String args[]){
     Scanner scanner=new Scanner(System.in);
     System.out.println("Enter first number");
     int a = scanner.nextInt();
     System.out.println("Enter second number");
     int b = scanner.nextInt();
     int c = a+b;
     System.out.println("Addition is: "+c);
}
}
```

1. Machine Code(C, C++)
2. Byte Code (Java)
3. Programming language

Source Code → COMPILER → Target Language → CPU

000000 00001
00010 00110
00000 100000

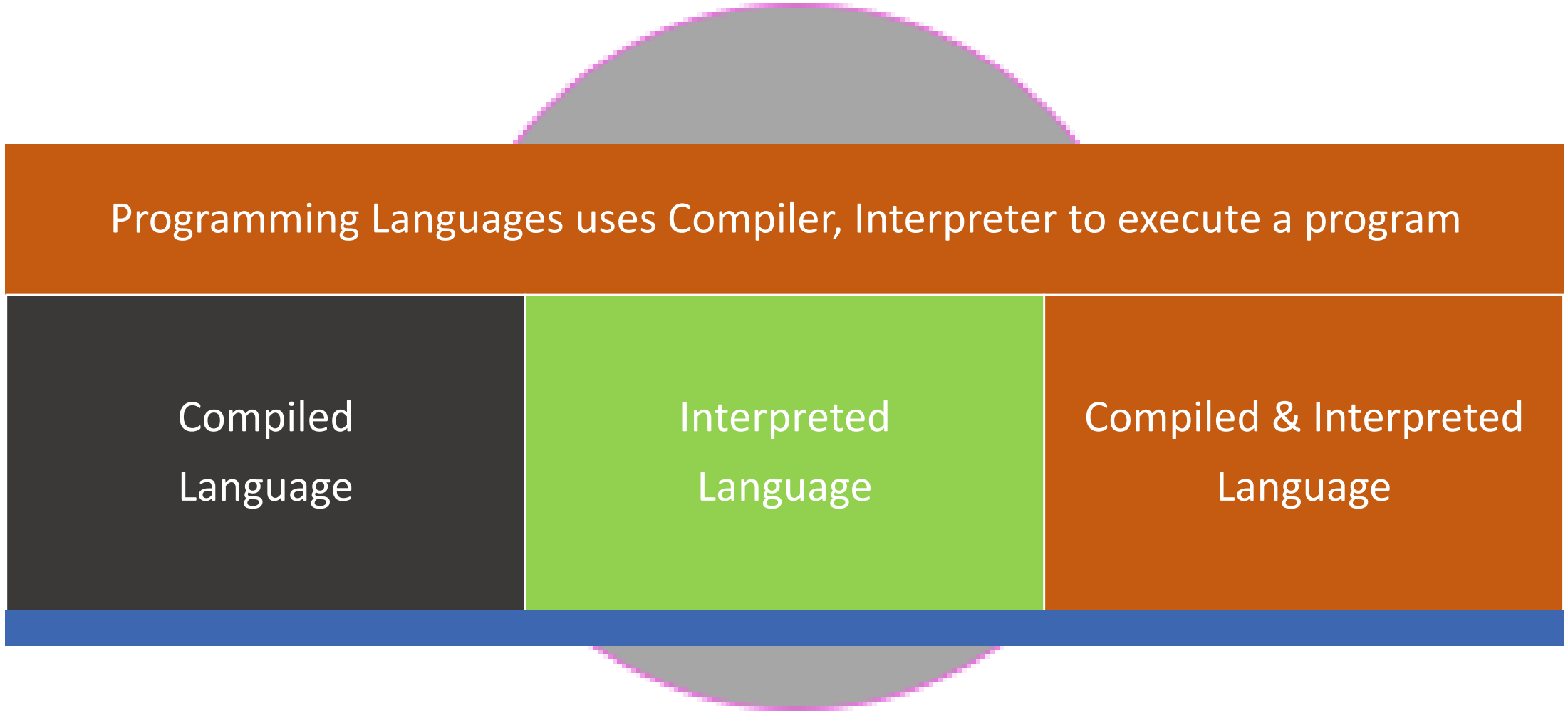
Low level/Machine code

Very Difficult

Assembly level language → ASSEMBLER → Machine language

add $a, $b, $c

But assembly level language is also quite difficult


Programming Languages uses Compiler, Interpreter to execute a program
Compiled Language
Interpreted Language
Compiled & Interpreted Language

Compiled languages

```java
import java.util.Scanner;
public class Addition{
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}
}
```

Ex: C, C++, Erlang, Go are some of the pure compiled languages

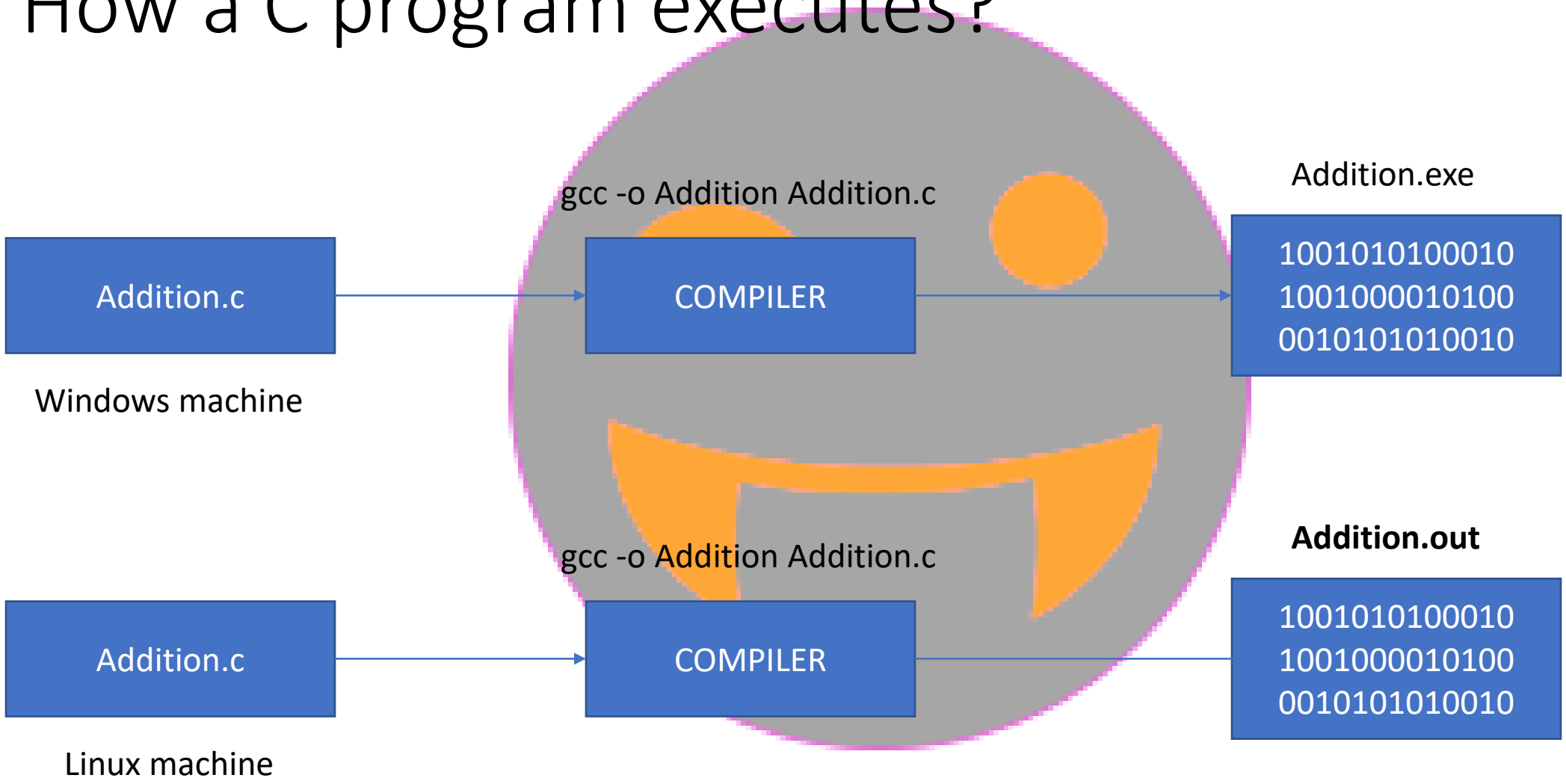
Verifies syntax, semantics of the source code
Checks if everything is fine.

మా గదికి భోజానికి రండి → **Syntax error** → మా గదికి భోజనానికి రండి

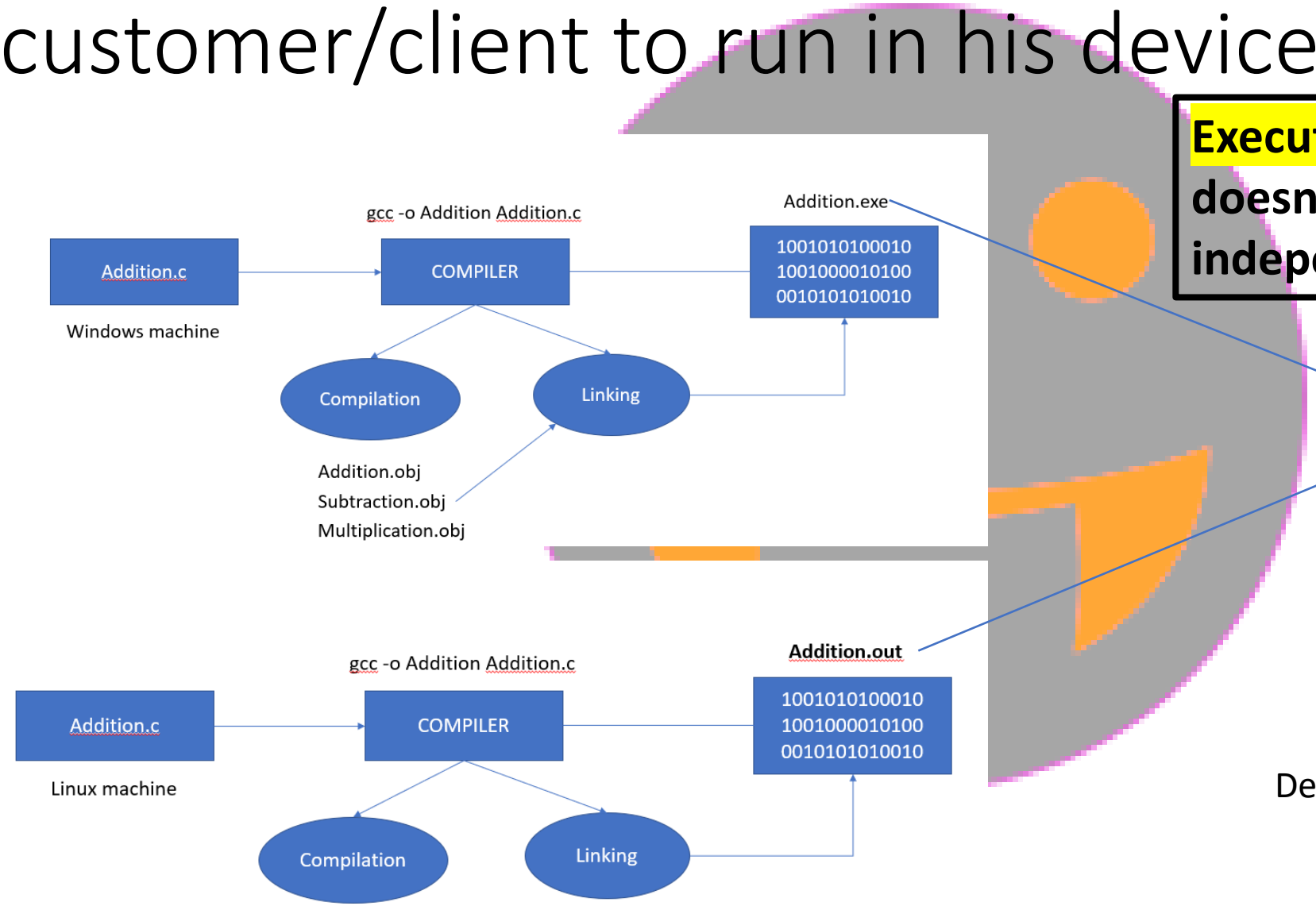
Semantic error ↓

మా ఇంటికి భోజనానికి రండి

How a C program executes?



Now give the compiled code to customer/client to run in his device



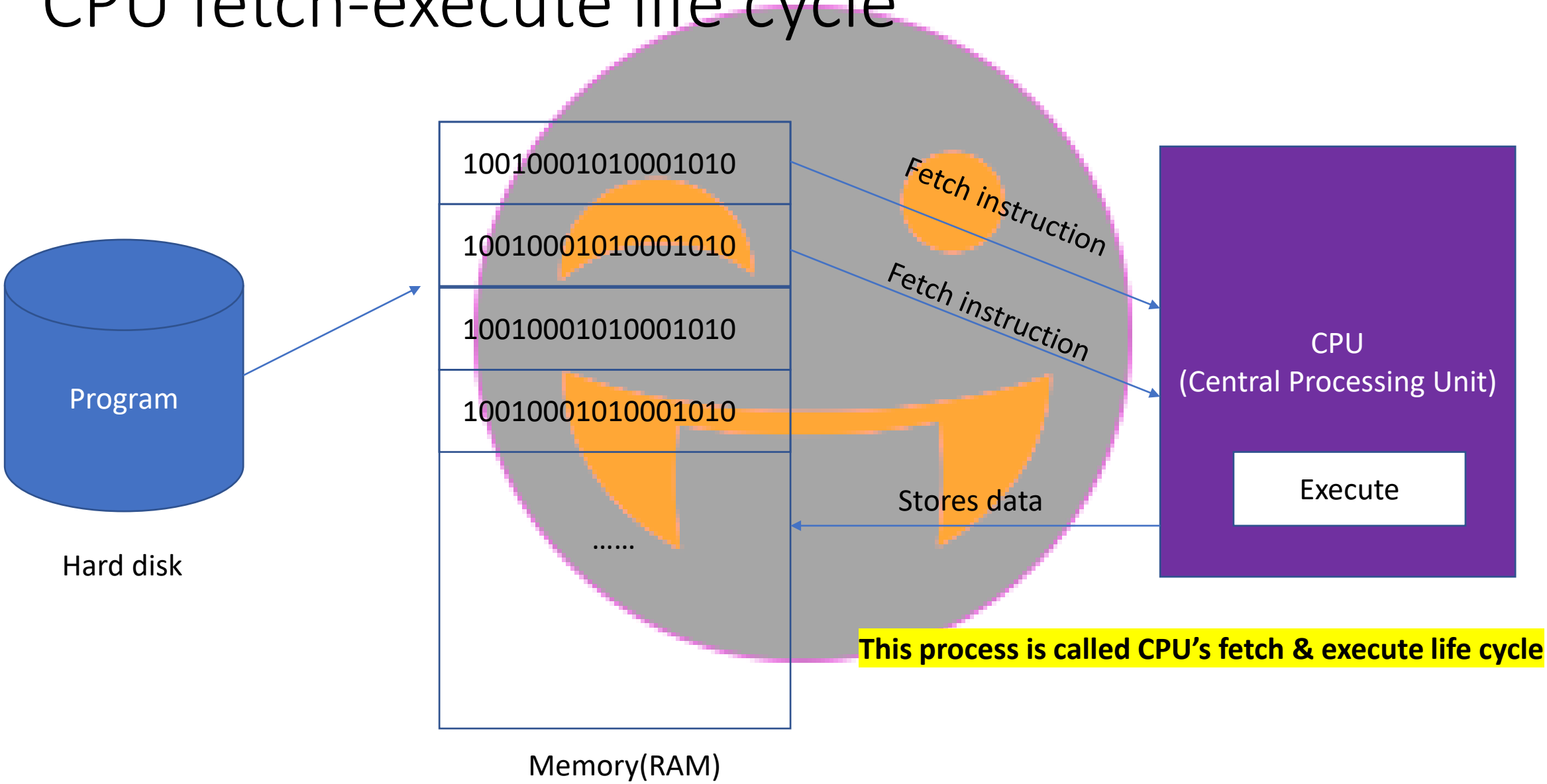
Execution is very fast but doesn't allow platform independence

MAC Machine

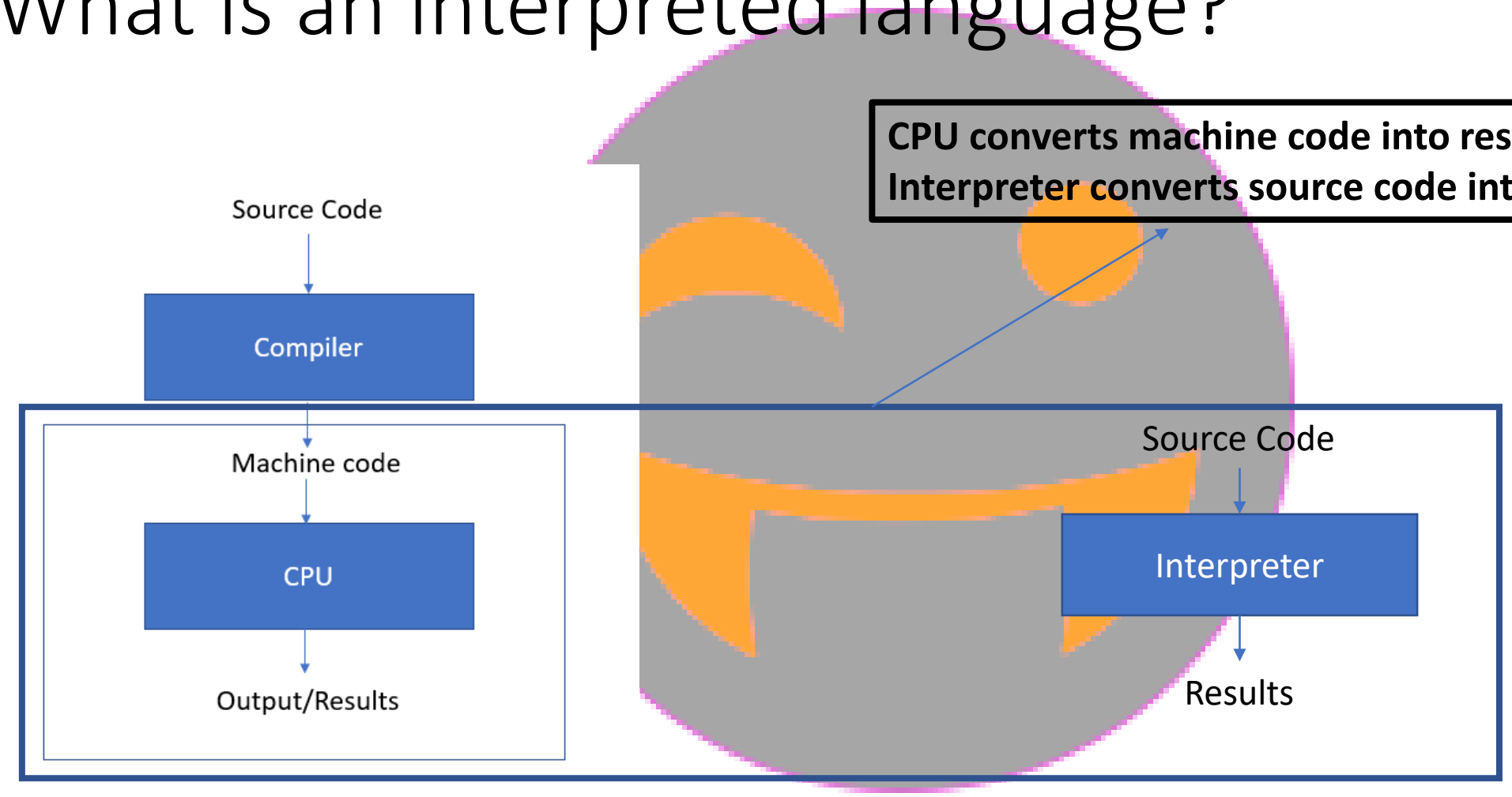
Platform Dependent

Dependent on operating system and Hardware(processor etc)

CPU fetch-execute life cycle



What is an interpreted language?

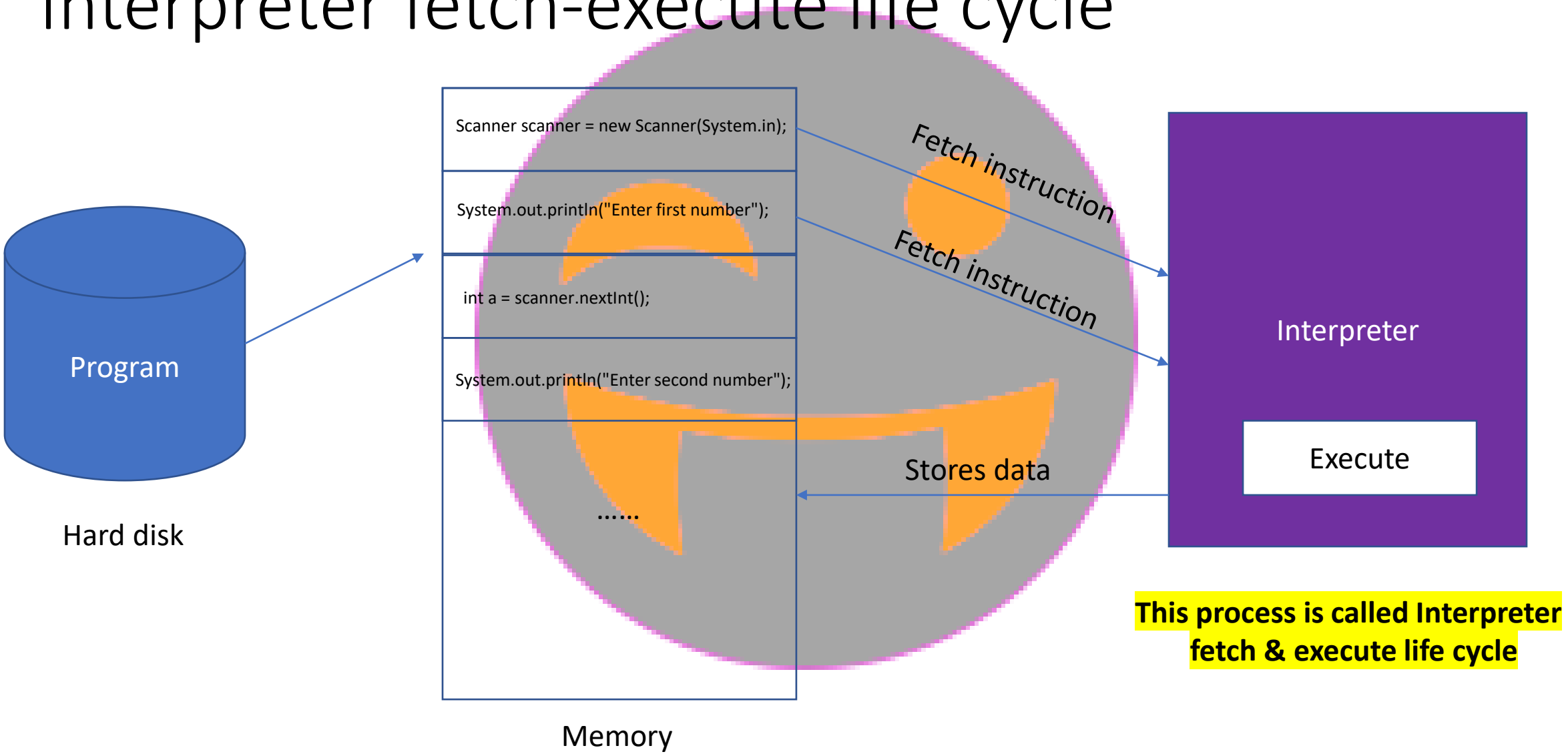


CPU converts machine code into results whereas Interpreter converts source code into results

Compiled language

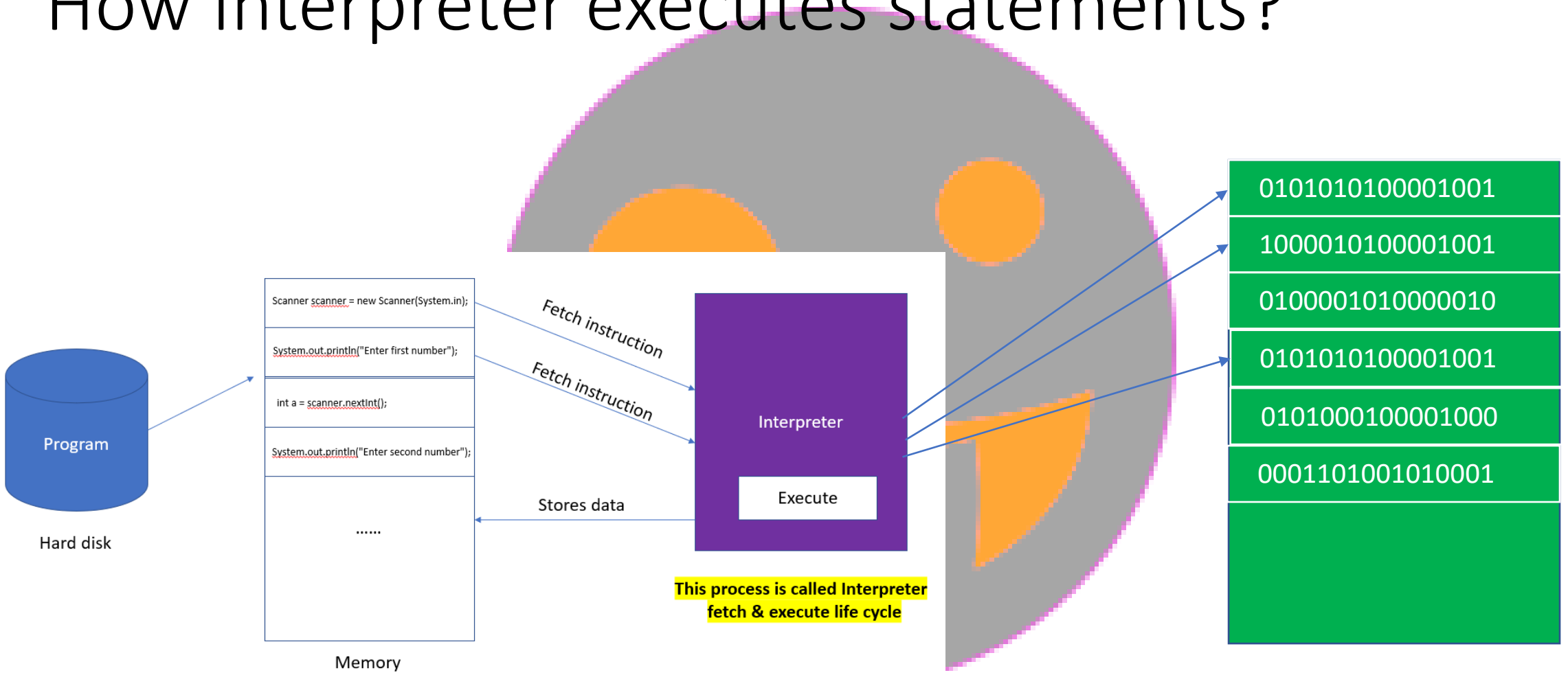
Ex: Python, JavaScript, PHP, Ruby

Interpreter fetch-execute life cycle

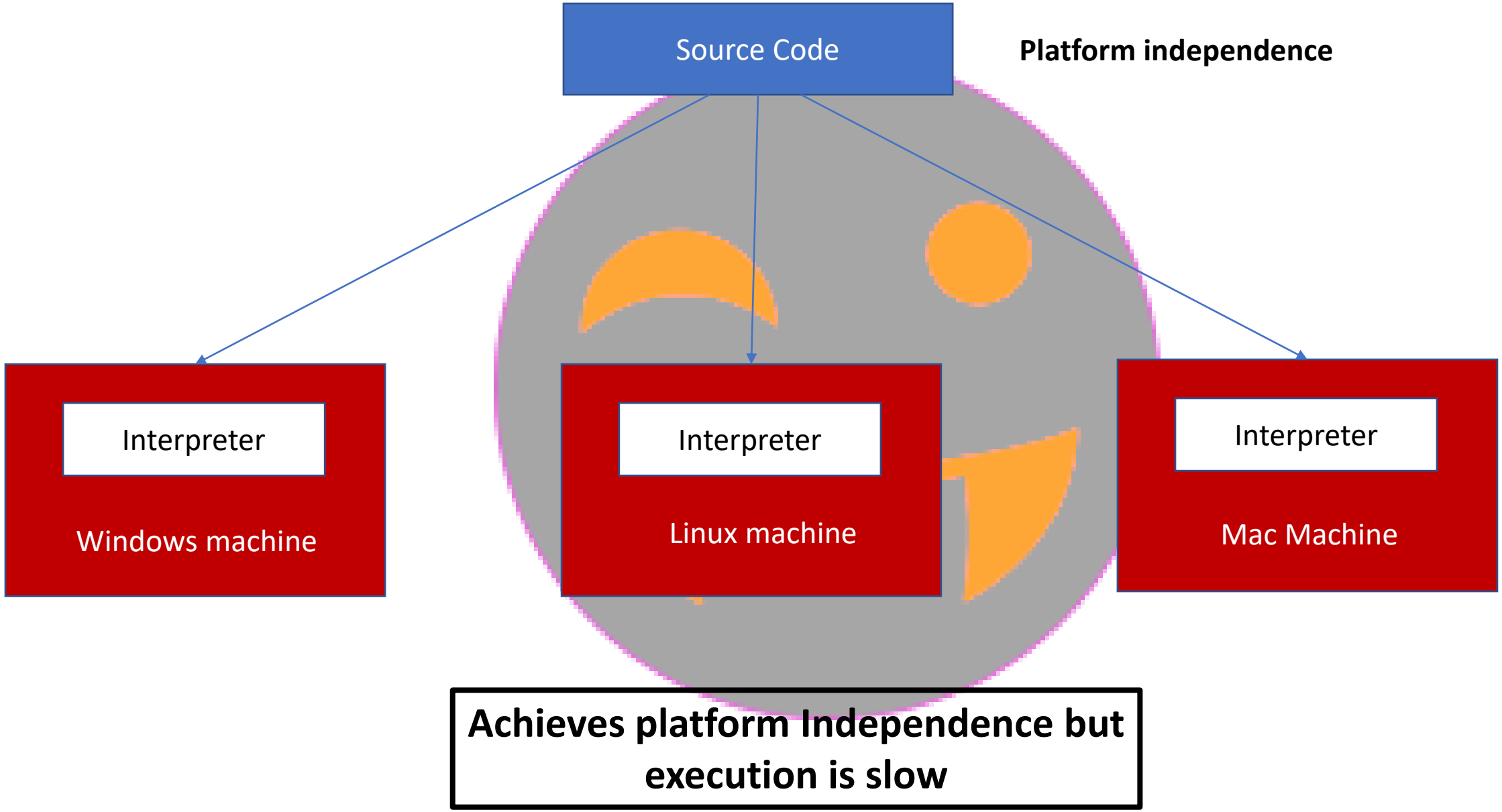


This process is called Interpreter fetch & execute life cycle

How Interpreter executes statements?



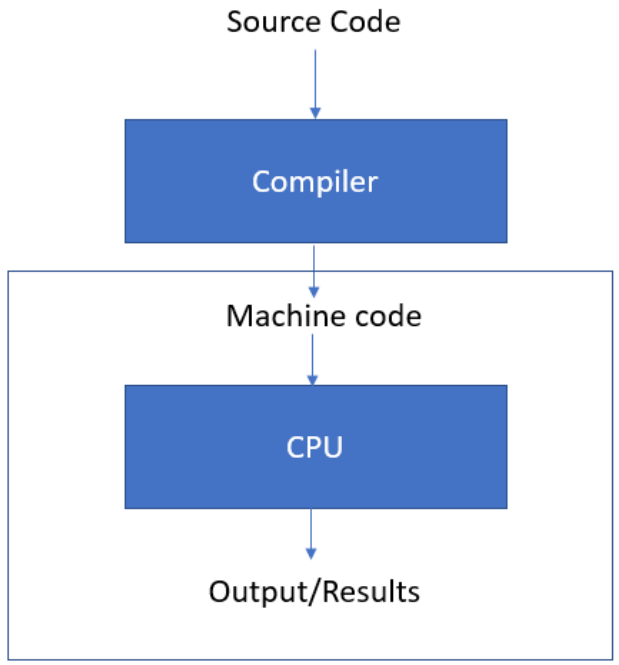
Advantage of Interpreter is the platform Independence

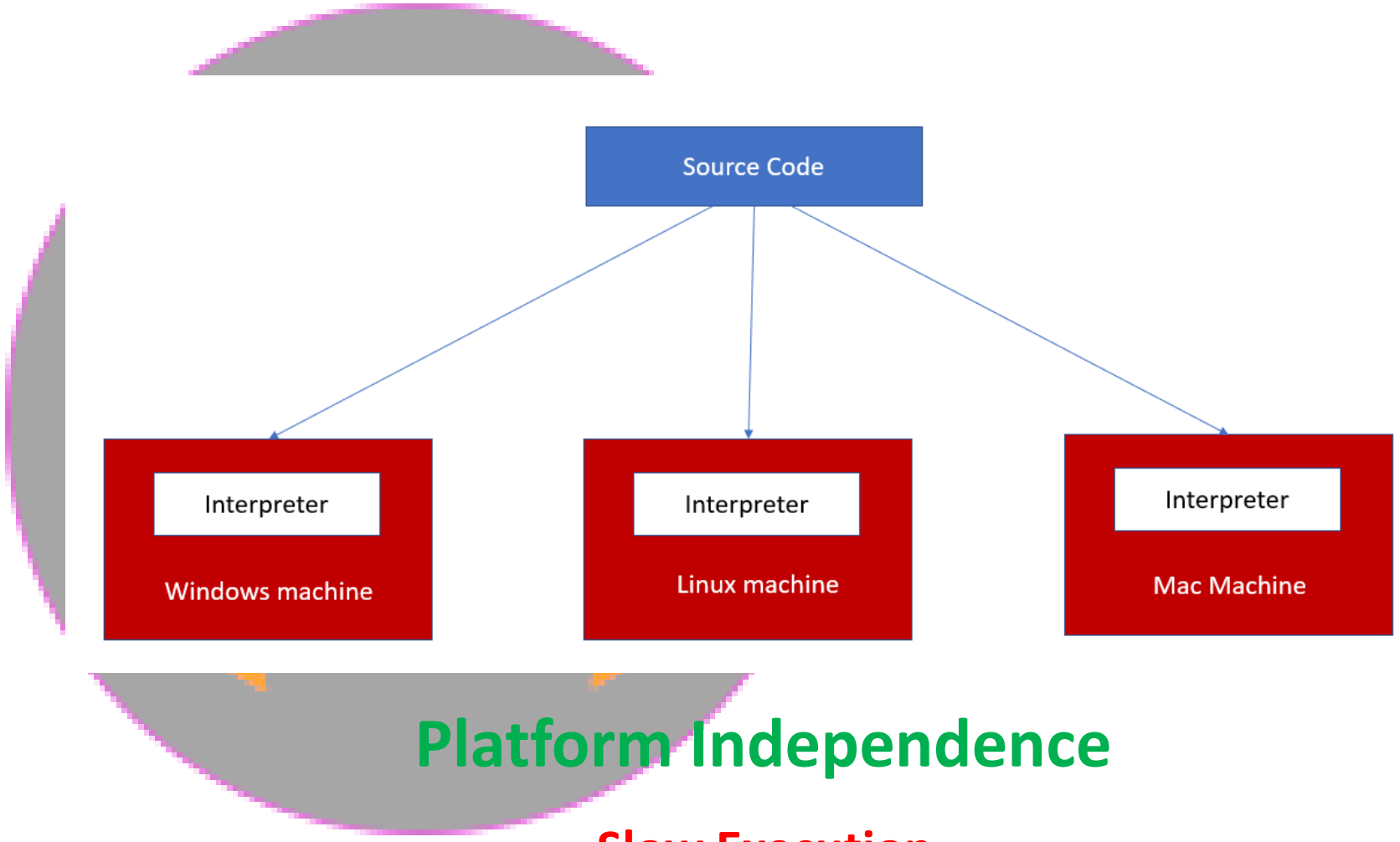

Source Code
Platform independence
Interpreter
Windows machine
Interpreter
Linux machine
Interpreter
Mac Machine
Achieves platform Independence but execution is slow

Difference between compiler and Interpreter

Compiler	Interpreter
Compiler checks the entire program and translates into the machine code at once	Interpreter checks the program one statement at a time and translates it into machine code
Compiler takes more time to analyze the source code, but takes less time to execute the program	Interpreter takes less time to analyze the source code, but takes more time(little slow than compiler) to execute the program
Ex: C, C++, Erlang, Go	Ex: Python, JavaScript, PHP, Ruby

But we want platform independence and faster execution





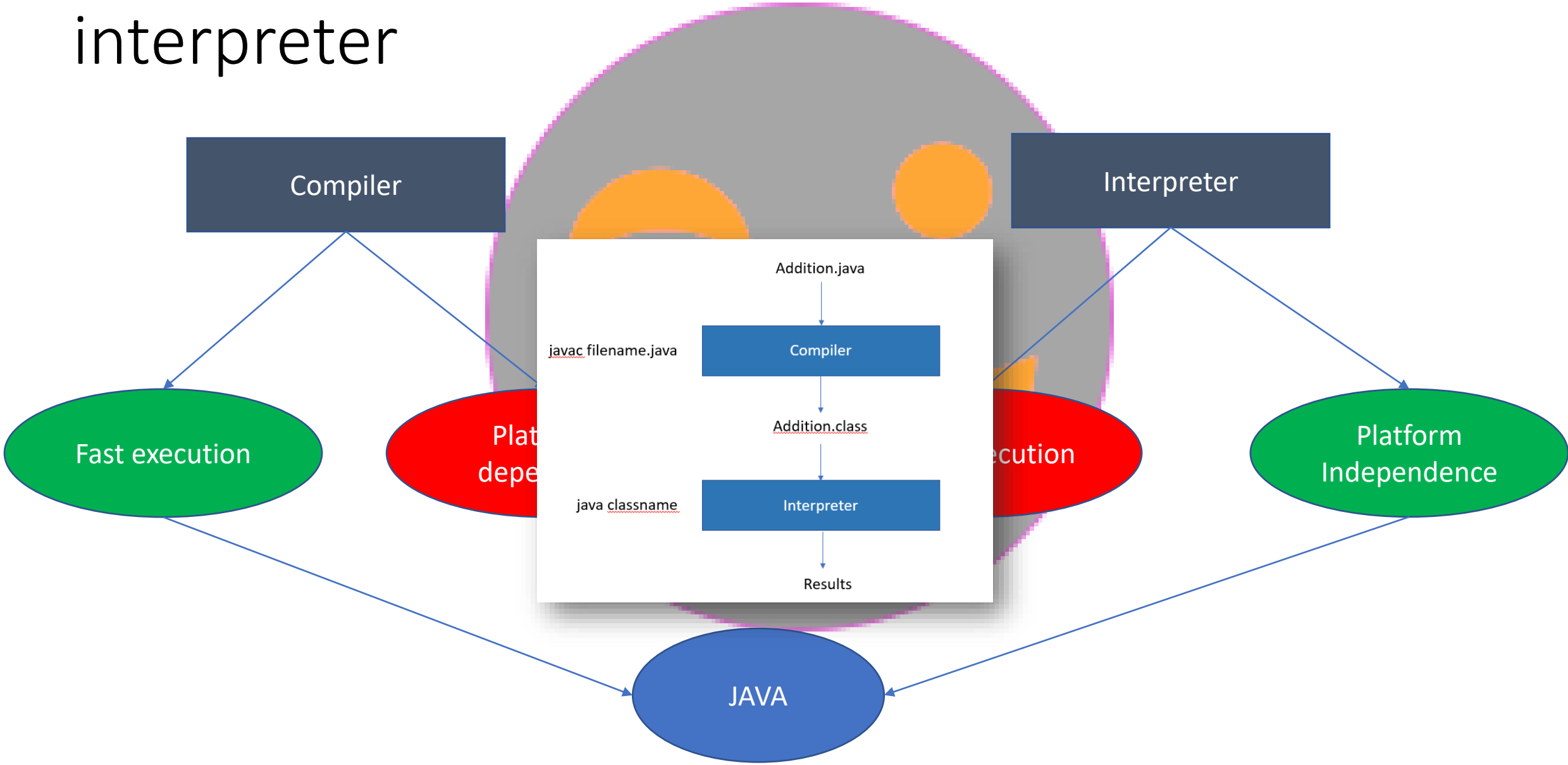
Faster execution

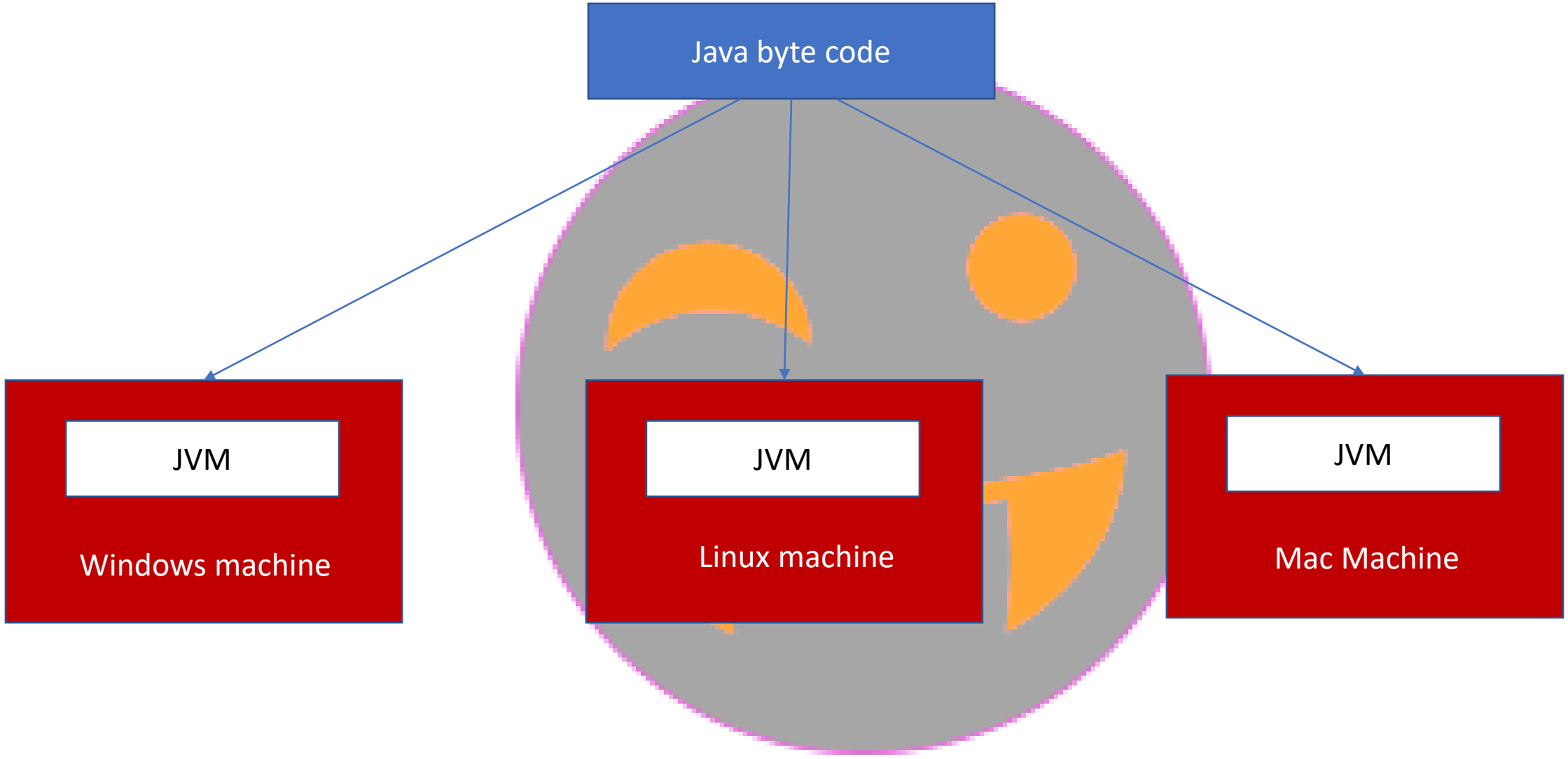
No platform Independence

Platform Independence

Slow Execution

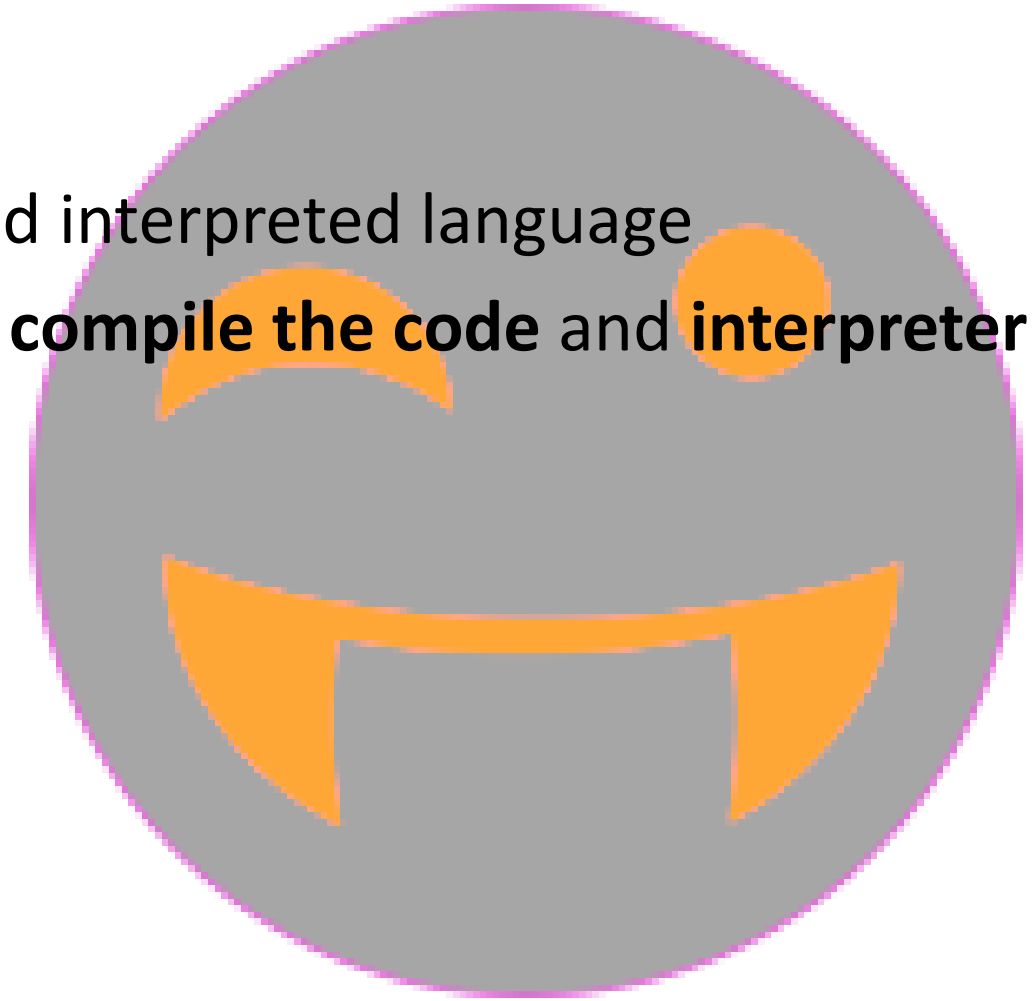
Java achieves both from compiler and interpreter



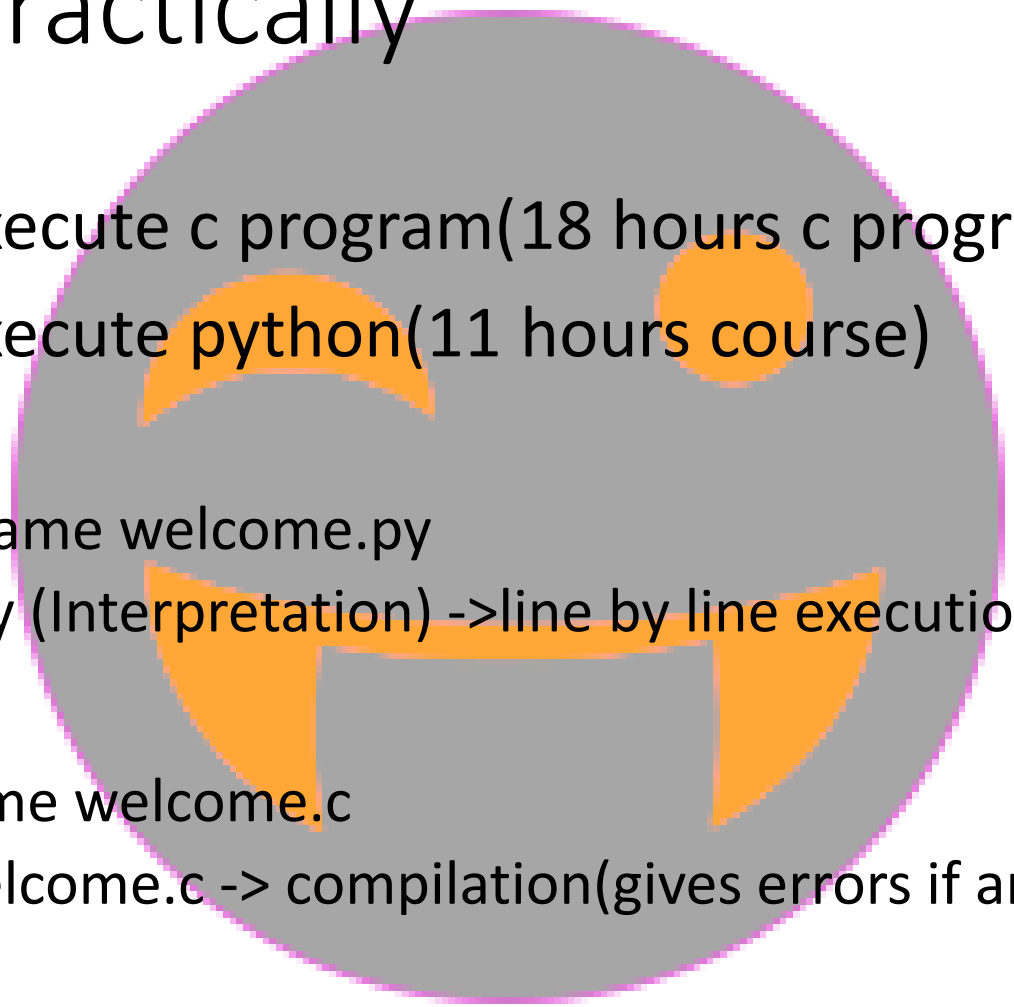

Java byte code
JVM
Windows machine
JVM
Linux machine
JVM
Mac Machine

Tell me, is java compiled or interpreted language?

- Java is compiled and interpreted language
- It uses **compiler to compile the code** and **interpreter to execute the code**

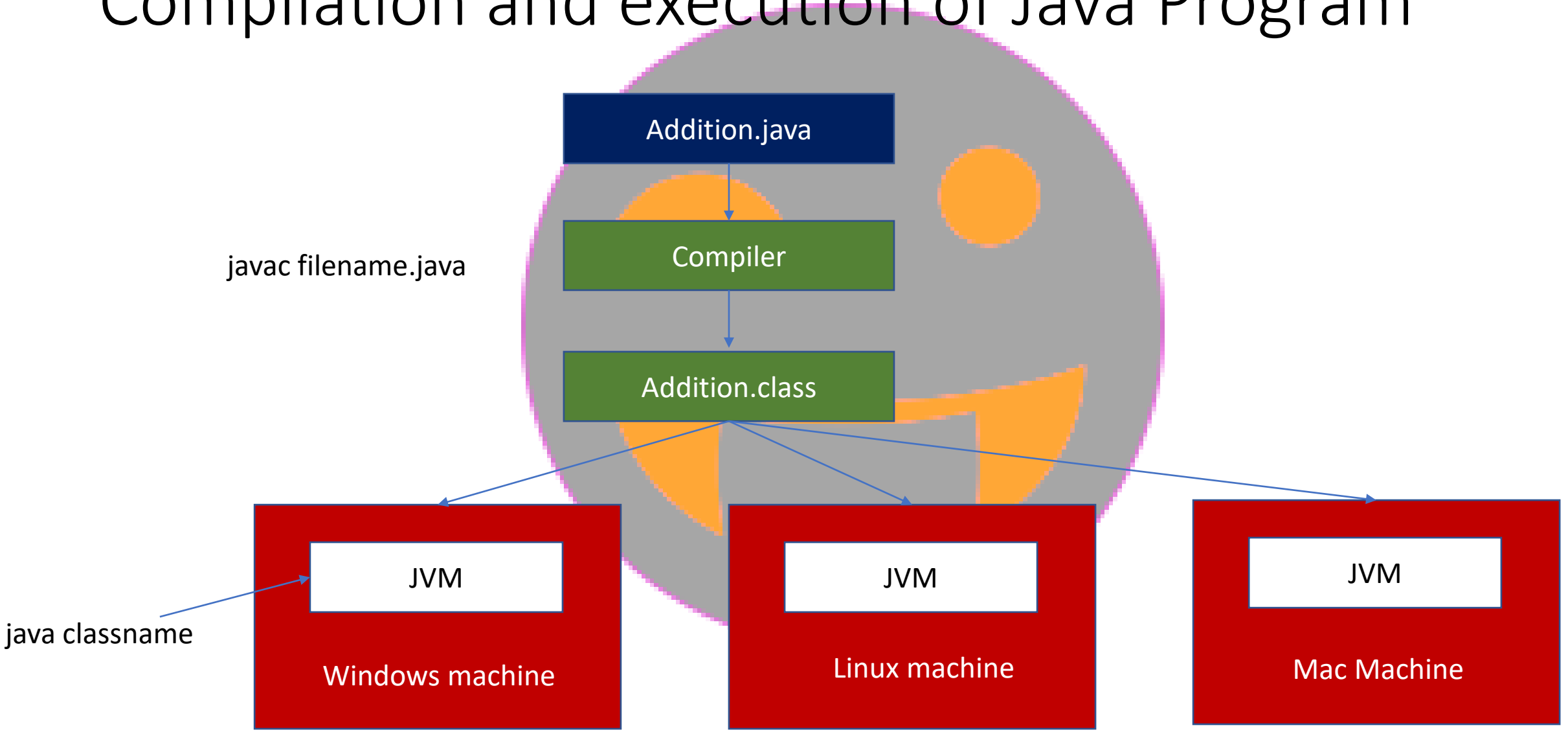


Let us see it practically



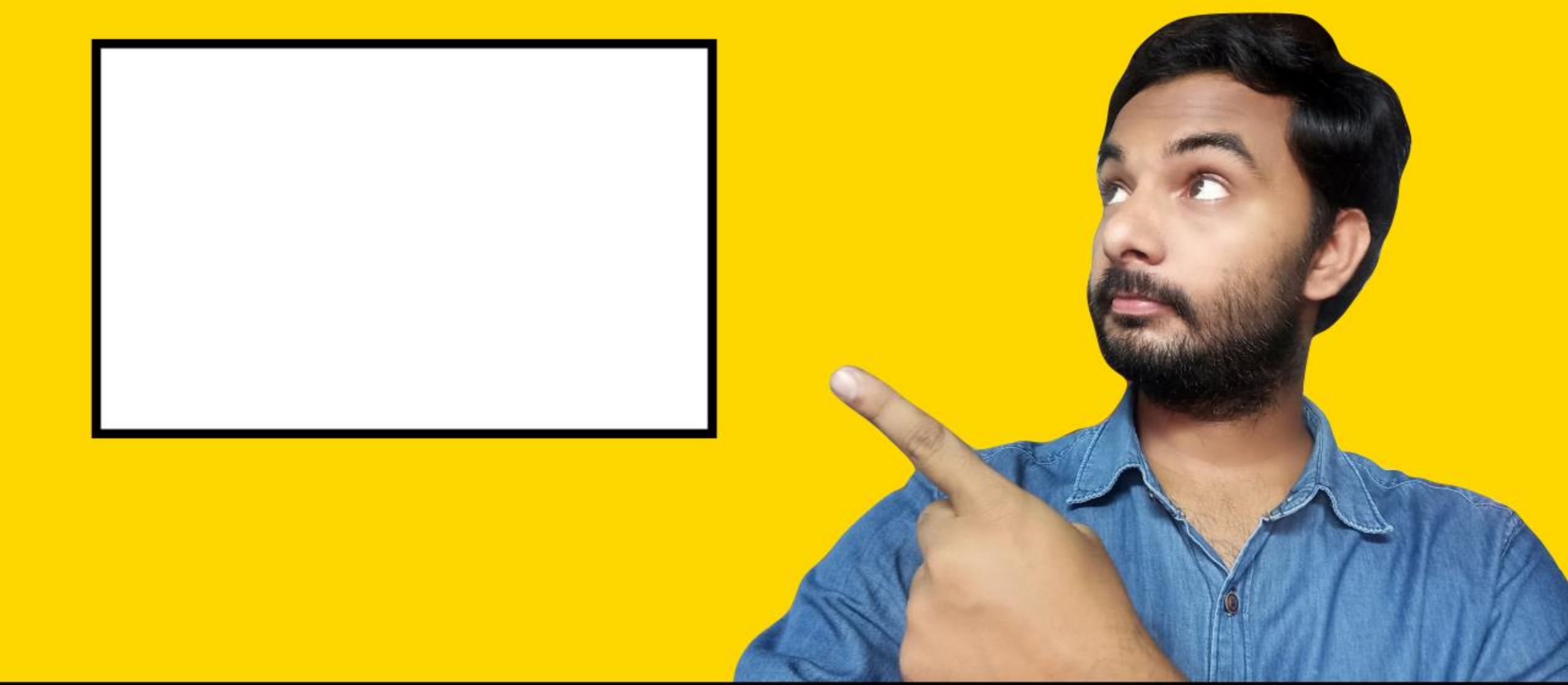
- We know how to execute c program(18 hours c programming course)
- We know how to execute python(11 hours course)
- Python
  - Create a file with name welcome.py
  - python welcome.py (Interpretation) ->line by line execution with example
- C
  - Create file with name welcome.c
  - gcc -o Welcome welcome.c -> compilation(gives errors if any in the entire program)
  - Welcome->running the program

Compilation and execution of Java Program



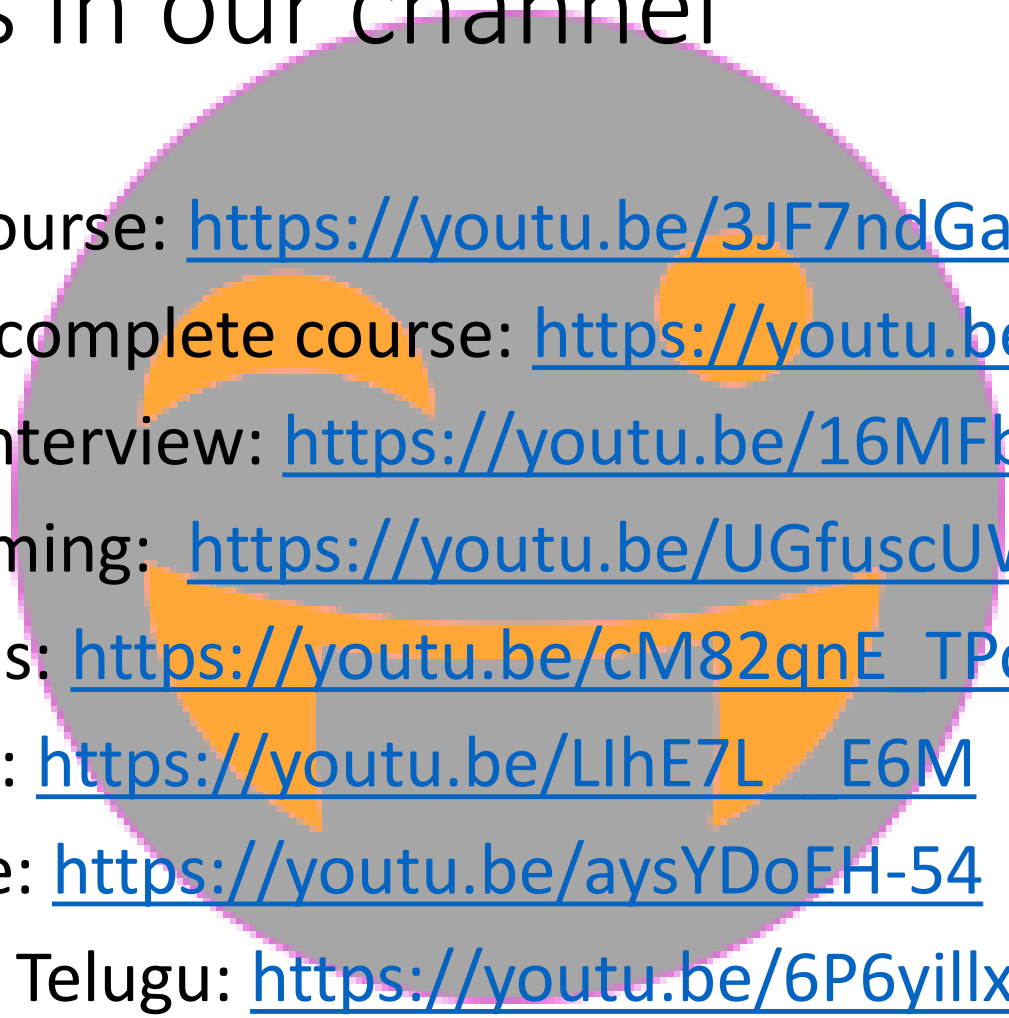
What next?

What is JVM, what does it do?



చిన్న బ్రేక్ చిటికలో వచ్చేస్తా

Other courses in our channel



- 👉 C 18 Hours Full course: https://youtu.be/3JF7ndGauZk
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- 👉 HTML Full course Telugu: https://youtu.be/6P6yillxZY4