PYTHON

✓ Python is general-purpose programming language. Created by Guido van Rossum and first released in 1991

✓ Programming syntax is very simple so its easy to learn and write code

✓ Vast Library so no need to write some functionality in your program from scratch

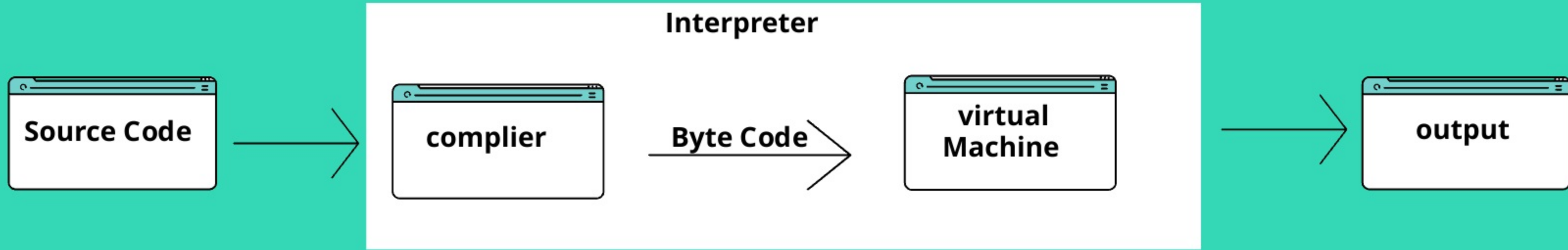✓ Used for Desktop development ,Web development and Scripting .

✓ Most commonly used in Data Science and Machine learning so anyone without much knowledge in programming can used it to train and deploy machine learning models using pre existing libraries and frameworks .

✓ Huge community support.

Interpreter

Interpreter: is a software than can be written in any programming language. Its a program that can execute another program.
The default interpreter for Python is written in C and is called CPython.
Interpreter and other default libraries will be installed by default when you install python in your machine.

Interpreter has:

1.Complier:

Cpython checks the syntax of the Source Code and converts it into byte code (python specific represent of source code) and sends it to Virtual Machine for execution. Incase of any issue it throws syntax error.

2. Virtual Machine:
Virtual Machine is not like VMWare or Oracle virtual box. It dose not contain any guest OS ,so it dose not not emulated OS ,Its a software that can help the Python programming language to run on a variety of CPUs. Virtual machine will receive the byte code and it will executes the machine code corresponding to each bytecode. Incase of any issue it throws Run Time error.

Some other Python interpreters are

✅ Jython consists of Java classes that compile Python source code to Java byte code and then route the resulting byte code to the Java Virtual Machine (JVM)
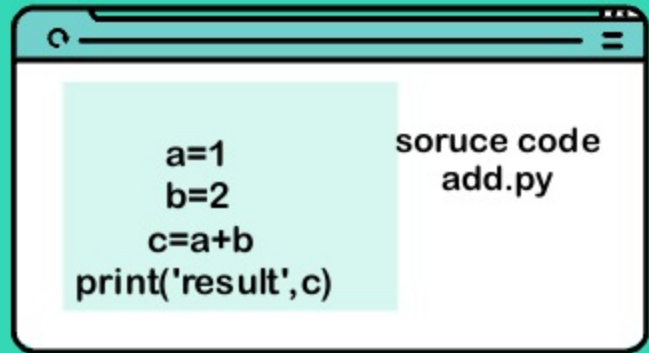
✅ IronPython is an implementation of Python written in C# for the .NET framework.

✅ Python is a interpreted language but before interpretation there is a compilation step that is hidden from programmers , so python language implementation is done through both compilation and interpretation.
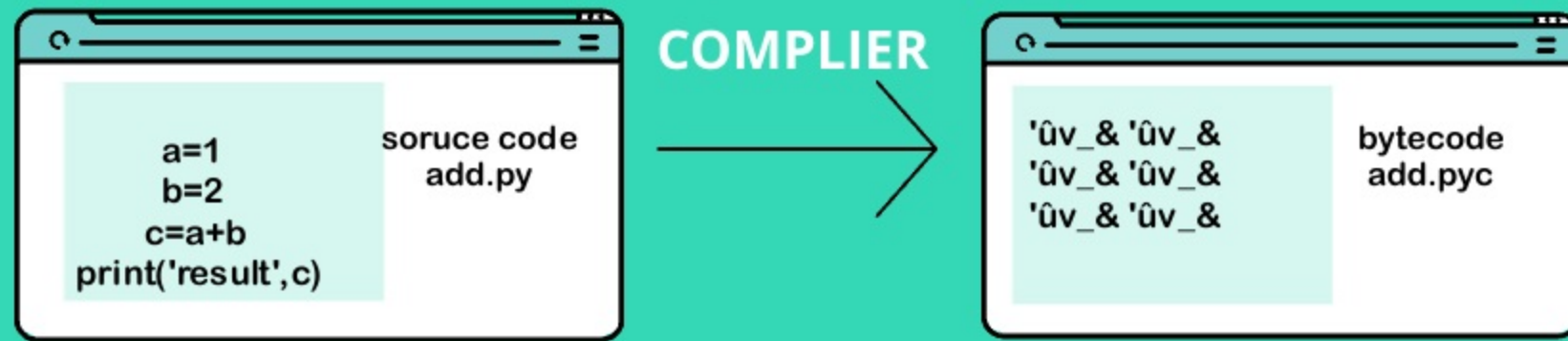
How Python Execute Program

```
a=1             soruce code
b=2               add.py
c=a+b
print('result',c)
```

SOURCE CODE

1.Written by humans,

2.Readable by humans

3.In python we save it with (.py)
extension

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BYTE CODE

1. Complier covert source code to byte code .Byte code is a low-level platform-independent representation of source code

2. Why is it needed ? portability/platform independence

3. How is it executed ? PVM –Python virtual Machine

4. The files are stored in bytes so its not readable its extension is .pyc

How Python Execute Program

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'ûv_& 'ûv_&
```

```
                machine code
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00111 001
```
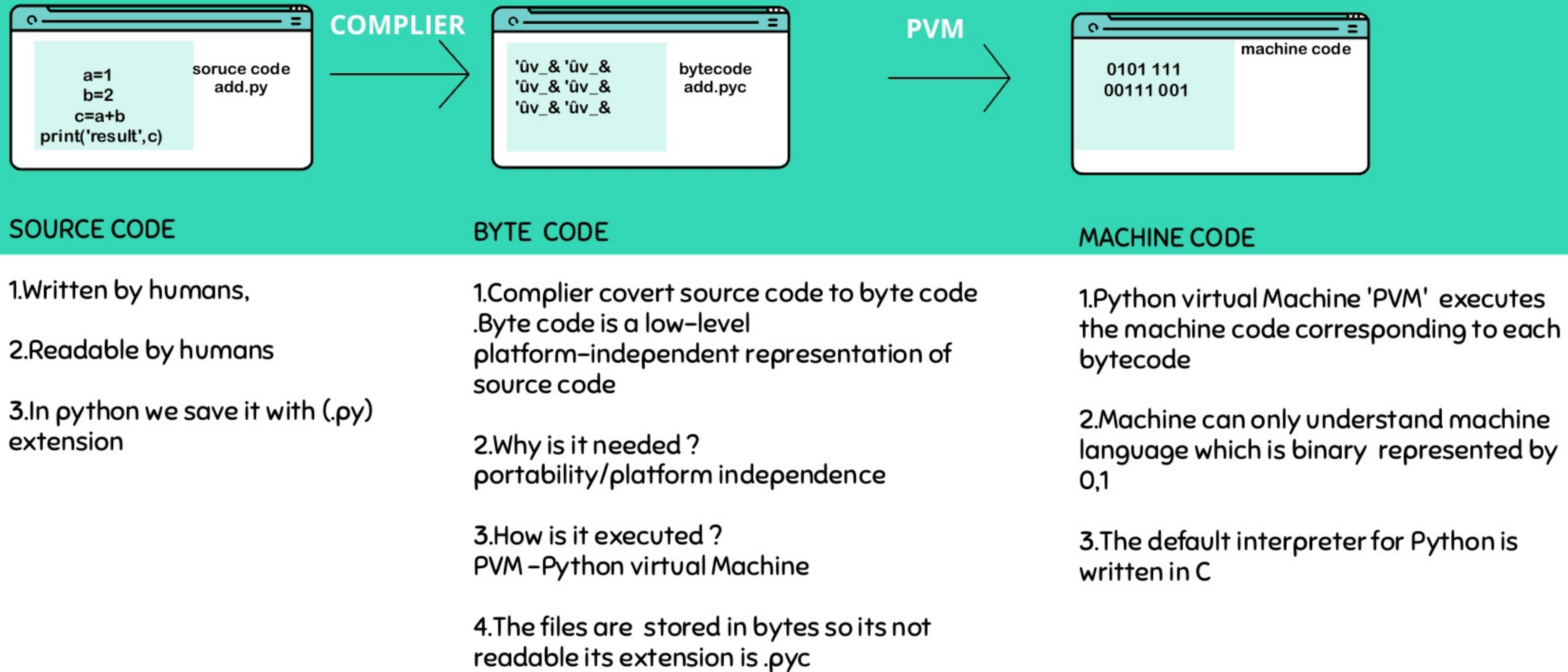
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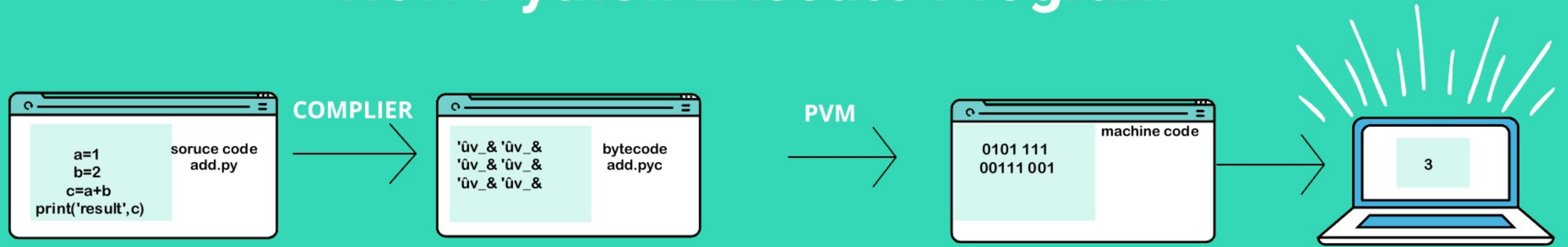
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MACHINE CODE

1.Python virtual Machine 'PVM' executes the machine code corresponding to each bytecode

2.Machine can only understand machine language which is binary represented by 0,1

3.The default interpreter for Python is written in C

How Python Execute Program

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PVM

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