

	C++	Python	Java
Language translation	Compiled	Interpreted	Both compiled and interpreted
Portability	Non-portable	Portable	Portable with JVM (Java Virtual Machine)
Programming paradigm	Both procedural and OOP	Purely OOP	Purely OOP
Speed of execution	Fastest of the three	Slowest of the three	Slower than C++ but faster than Python
Data typing	Strongly typed	No data typing	Strongly typed
Statement Block	Using curly braces – { and }	Using indentation	Using curly braces – { and }
Library	Minimal	Very rich	Rich
IDE	<ul style="list-style-type: none"> • Turbo C++ • Borland C++ • Eclipse 	<ul style="list-style-type: none"> • PyCharm • Spyder • Eclipse 	<ul style="list-style-type: none"> • BlueJ • Apache NetBeans • Eclipse

Python, and Java are all high-level programming languages. Therefore, programs written in these languages (source codes) need language translators

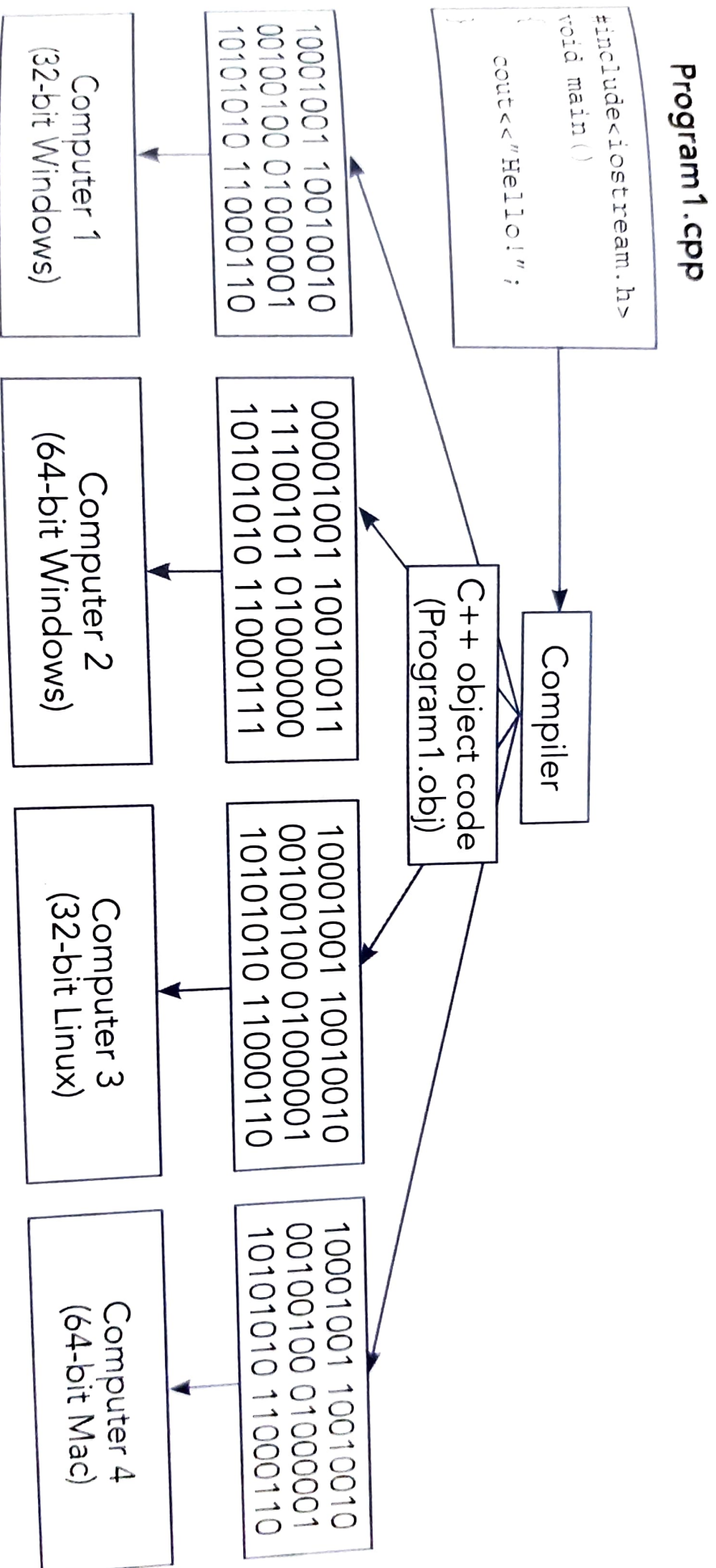


Fig. b.1 Machine dependence of a C++ program

Python is an interpreted language. Therefore, to run a Python program (filename extension .py) you need a Python interpreter software installed on your computer system (Fig. b.2). Thus, it is a machine independent language.

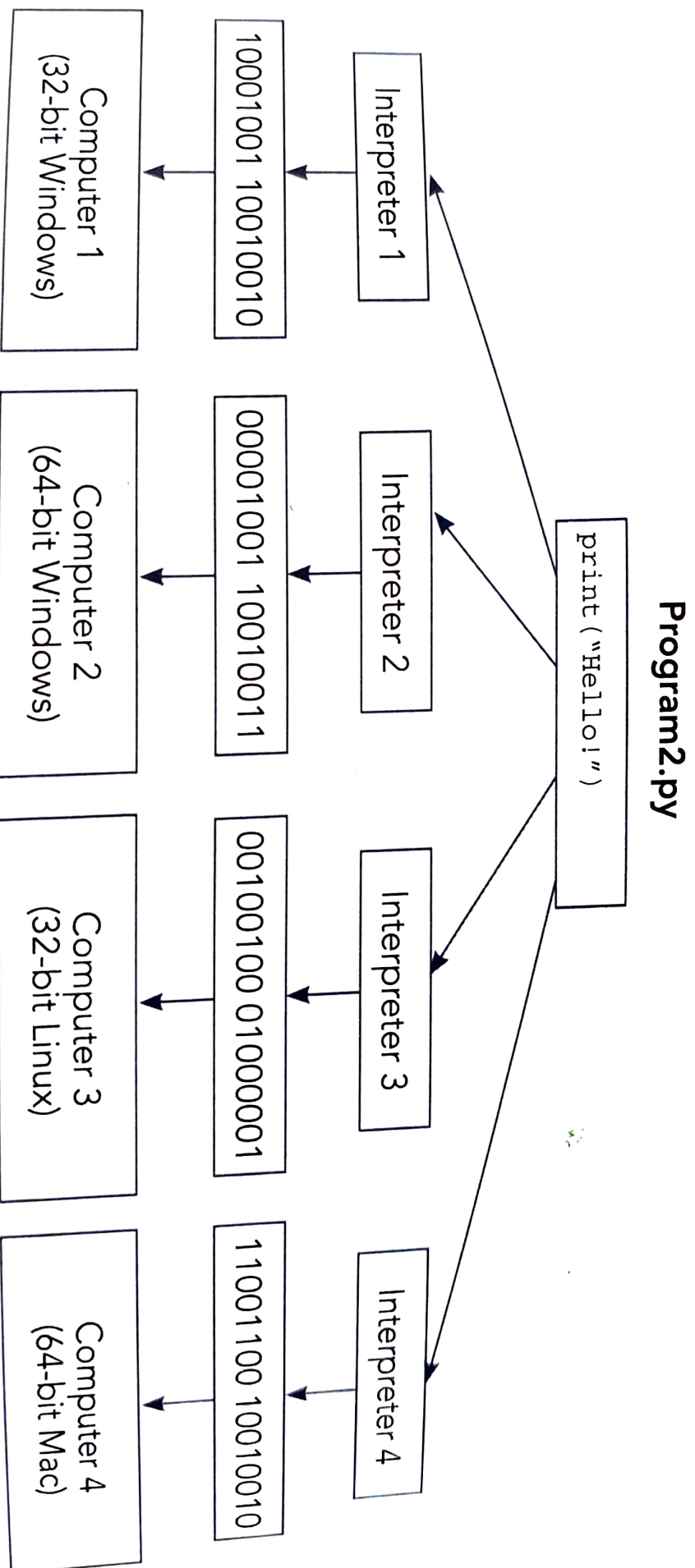


Fig. b.2 Machine independence of a Python program

Java is both compiled and interpreted language. A Java program is compiled into a language of an imaginary machine called Java Virtual Machine. The compiled code

```

{
    public static void main(String[] args)
    {
        System.out.println("Hello!");
    }
}

```

Compiler

Java Bytecode
(Program3.class)

```

00001001 10010011 11000101 11000101 10110110 11110001 10101101 111110000
10101110 10100001 10100101 00011010 01101011 10110010 00101011 10101001
10101101 111110000 10101101 111110000 10101110 10100001 10100101 00011010
01010101 01101011 10110010 10101110 10100001 10100101 00011010 01101011

```

Interpreter

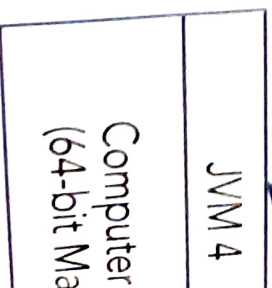
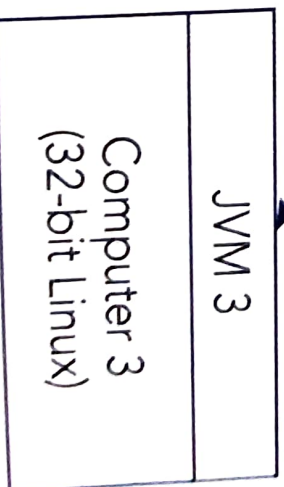
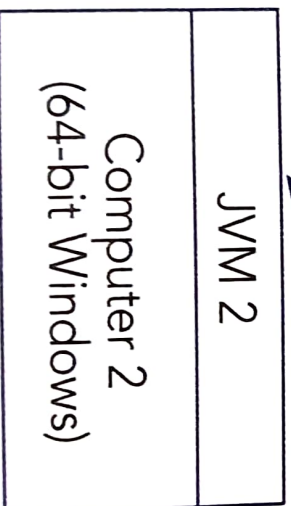
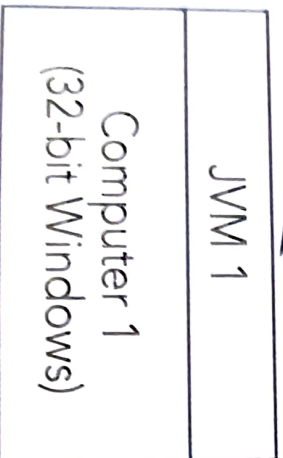


Fig. b.3

Machine independence of a Java program

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