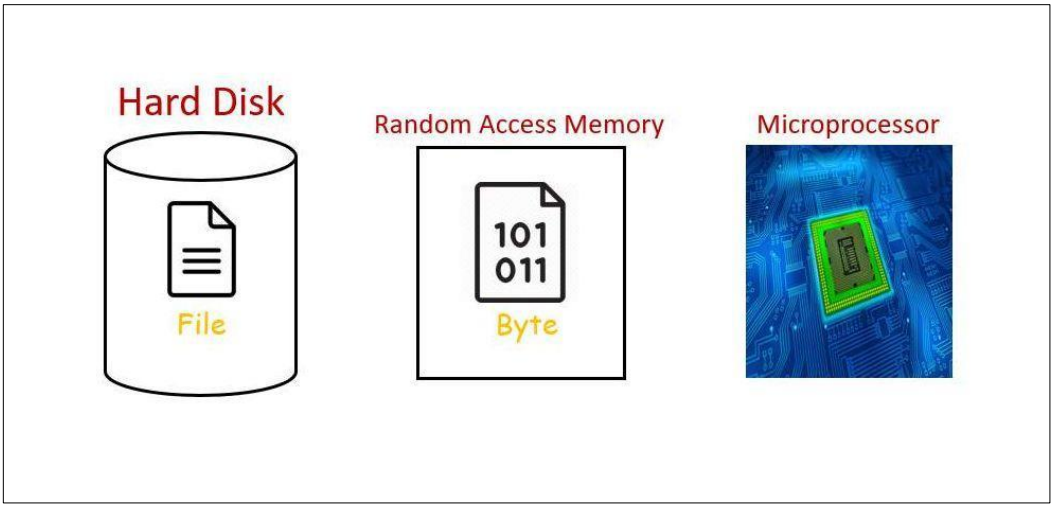
Features of JAVA

OPERATING SYSTEM

The heart of computer in terms of hardware is *Microprocessor*. But the must be another 2 memory devices are *Hard disk* and *RAM.*

All the hardware devices don't have ability to work on their own.

There is a requirement of software to provide instructions which referred to as "*Operating System*".



Platform Dependence

What is Platform?

Computer is a combination of hardware and software this is called as "*PLATFORM*". Hardware mostly refers to microprocessor. Software mostly refers to Operating System.

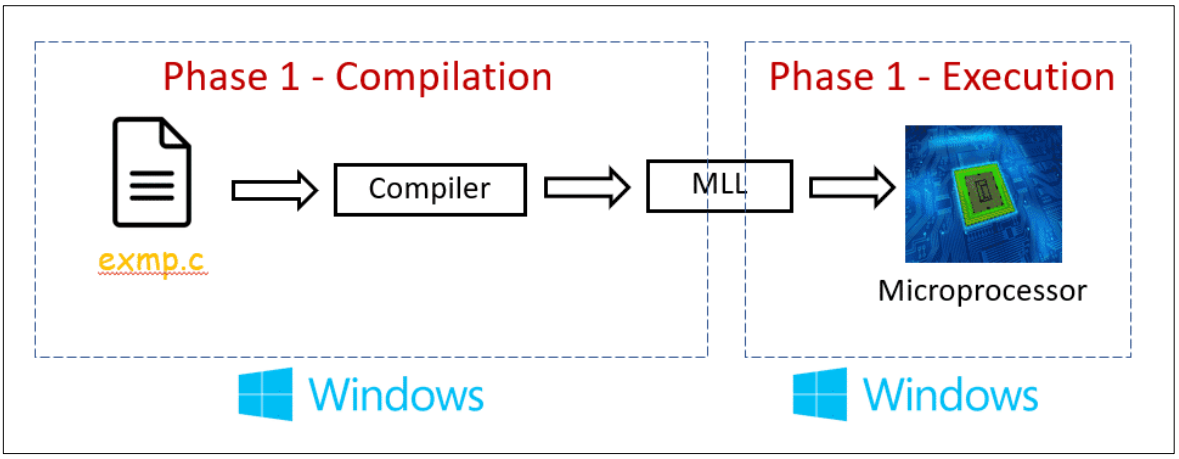
The combination of microprocessor and OS is called as platform.

For example:

- i5 is processor and Windows 10 is OS. This is platform.
- i3 is processor and Mac is OS. This is platform.
- i3 is processor and Linux/Unix is OS. This is platform.

DIFFERENT CASES IN PLATFORM DEPENDENCY

CASE 1



There are few programming languages are platform dependent / OS dependent.

For example: C language & C++ language

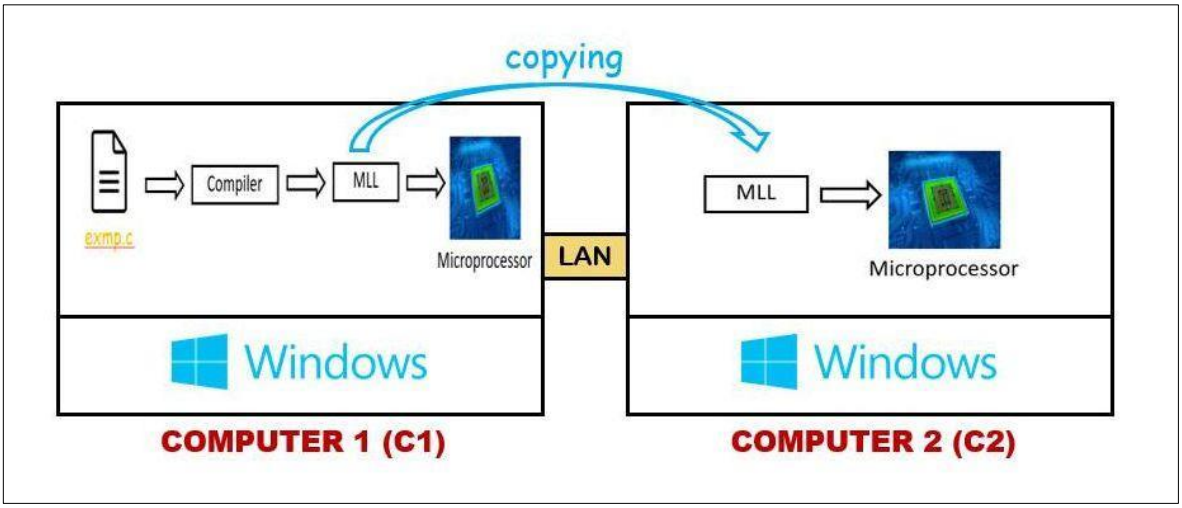
The process from typing a program to get a output can be divided into 2 Phase i.e

1. Compilation phase

2. Execution phase.

C programming languages are platform dependent because such programming languages which expects that the platform of compilation and platform of execution must be same.

CASE 2

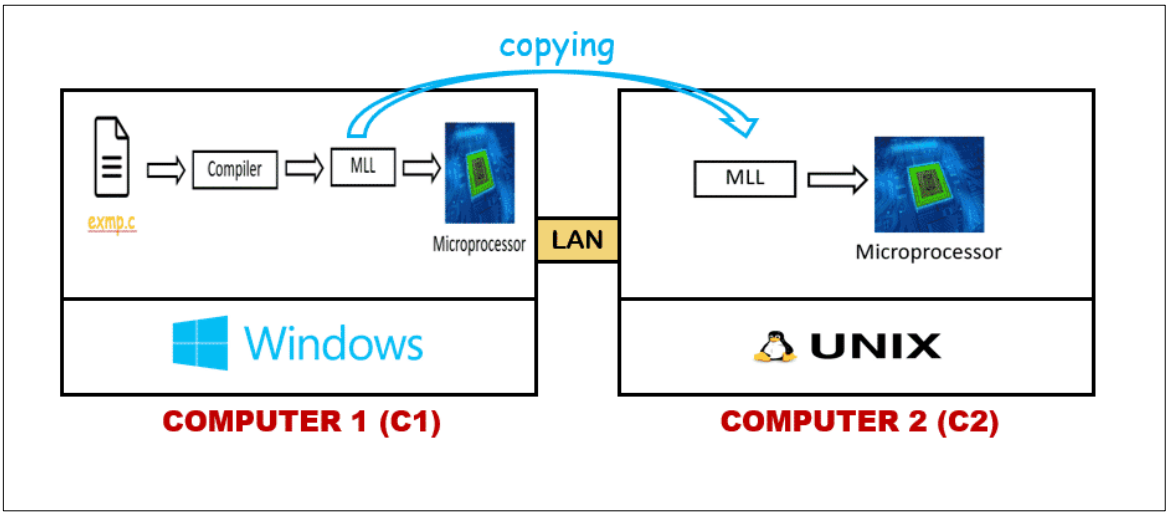


Here we have 2 computers i.e., Computer 1(C1) and Computer 2(C2) are connected to each other using LAN connection [Local Area Network] because data can be transferred from C1 to C2.

C1 will execute and give output, what if copy of machine level code is given to C2. Will we get the output?

If the platform is same, we will get the output and MLL will be executed on C2.

CASE 3

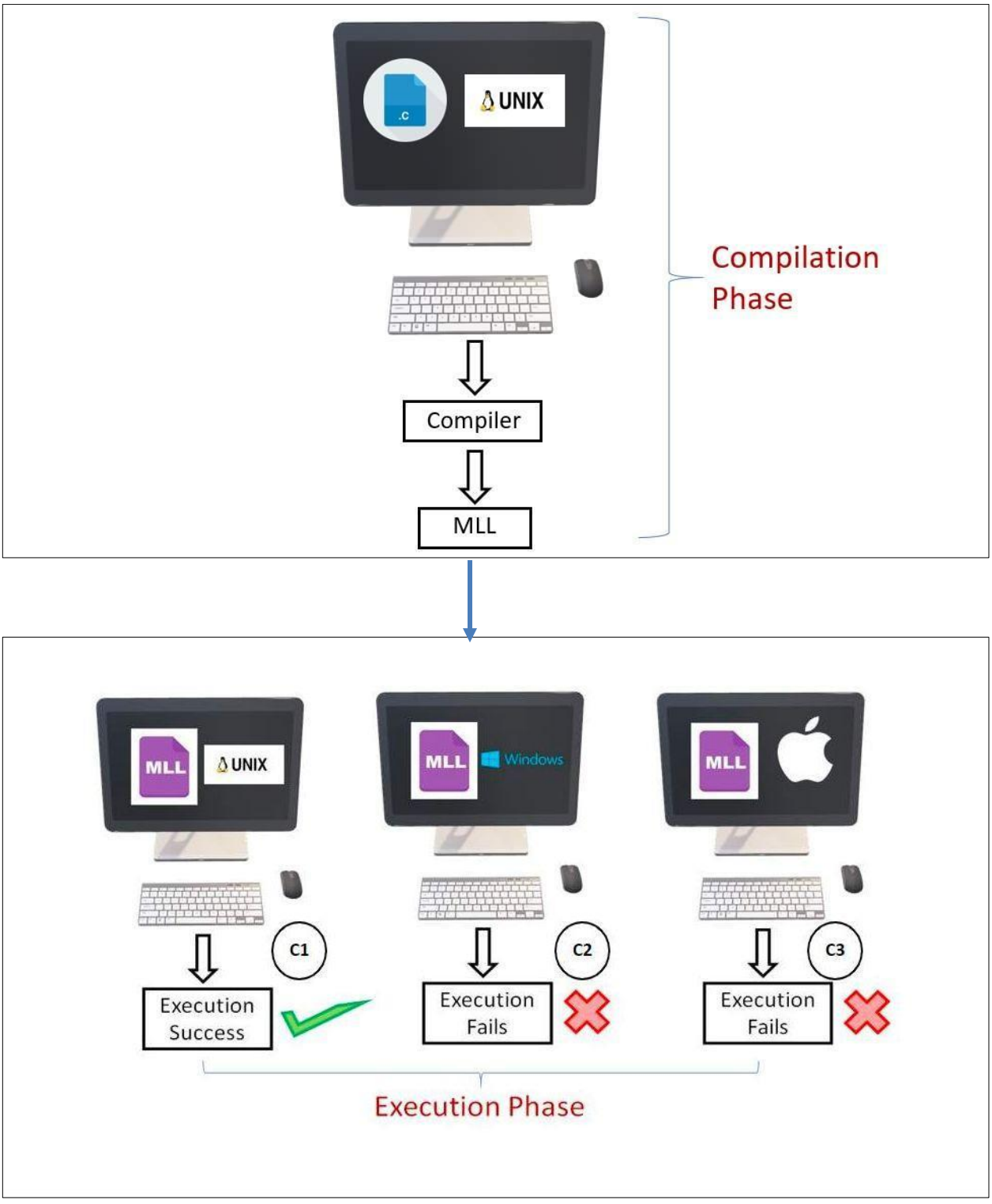


Here Computer 1 has windows operating system and Computer 2 has Linux operating system. The platform of two computers is different.

So, machine level language code in Computer 2 (C2) will not be executed.

Hence, platform dependency means the operating system of compilation and operating system of execution should be same.

Failure of platform dependent programming language



In C2 and C3 platform of compilation and platform of execution is different. So, the execution fails because usage of platform dependent programming language.

JAVA

James Gosling invented a platform independent programming language called as JAVA in the year **1994**.

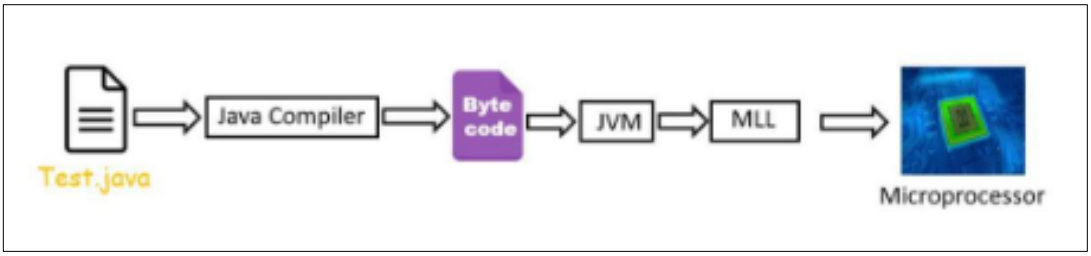
At first Java was called as **OAK**.

Java was originally designed for interactive TV, but the digital cable industry wasn't ready for the technology.

Java achieving platform independence

PLATFORM INDEPENDENCE

JAVA designed its own compiler called as Java Compiler which converts HLL into byte codes. This byte code is given to Java Virtual Machine (JVM) which converts it to MLL.



WORKING:

Let us assume you are writing code using java in your computer which has windows OS. User should save the file with the extension *".java*" so that it is consider to be a java file.

For example, consider ***Test.java*** is a file which consist of HLL code. Since Machine understands ***Machine Level code [MLL]*** not your ***high-level code [HLL],*** conversion must happen.

Let us see how exactly conversion happens in java.

Initially your HLL code is given as input to compiler but java compiler will not give **MLL** code as output like C and C++ compiler rather it takes **HLL** as input and gives a special type of code as output called as "***BYTE CODE***" which is platform independent.

Byte code is neither **HLL** code nor **MLL** code, hence it is also referred to as ***intermediate code.***

If you can recollect machine understands only **MLL** code but **java compiler gave you byte code**.

To resolve this, **James Gosling** provided a software called as ***"Java virtual Machine"(JVM)*** which was platform dependent that is different OS have different *JVM.*

Since you are writing code on windows OS, you will have to download windows *compatible JVM.*

JVM will now convert byte code to machine level code which machine can easily understand.

In this way, java achieved platform in dependency using a special type of code which is byte code.