

## **What Is Programming – A Detailed Analysis on Computer Programming**

Information is usually processed in a computer when the computer using its parts completes task. However, these tasks are not simple to perform, when we see it in context to the language of computer. Mostly, these tasks are performed using different languages or often called various set of instructions to perform different tasks.

### **What Does Programming Mean?**

Programming can be referred to “a way of developing and executing numerous sets of commands to let a computer implement different tasks.” Programming is often referred to as computer programming and involves different activities or tasks like examination, accepting, discerning, and disentangling problems.

Programming also refers to confirmation of requests of the set of rules together with its exactness and its resource consumption, execution of the algorithm in an objective programming language. The algorithm is also known as a source code that is written by a programmer and is fed into the machine for its execution and to see possible results. When it comes to the generation of the source code, programmers have to choose any of the following programming languages:

see possible results. When it comes to the generation of the source code, programmers have to choose any of the following programming languages:

1. C
2. C++
3. C#
4. Java
5. Python
6. Smalltalk
7. JavaScript
8. Perl
9. Ruby
10. PHP

Using any of the above-mentioned languages, a programmer can execute the source code and can find the results. The result could be a solution to a problem, as well. Therefore, as a programmer, you need to have deep-insight of every part of programming method i.e. from source code formation to its execution, and from execution to the solution of the problem. A programmer must have logical as well critical thinking while forming a source code and executing it.

## How Does It Work:

Coding is all about implementing a set of instructions using a machine language to obtain a specific result. However, keep in mind that machines (computers) only understand the language of on and off. A binary code is a combination of 1s and 0s or you can simply say it a combination of on and off. For instance, 00101100 here represent 8 bits or 1 byte (1 Byte equals 8 bits in binary language).

If you would go for writing a source code into binary language, it will need super imagination, logical thinking, and high-level implementation to write that binary code as a source code. Thus, to ease up the matter, we choose a programming language, write a source code in any chosen language, and implement it on the machine (computer) to obtain required results.

## History of Programming Languages And Development:

Programming languages and their derivatives have been discovered and re-discovered in order to make the programming more logical and less prone to viruses and attacks. Back in 1843, Ada Lovelace wrote the very first code for the Analytical Engine, also known as the “Early mechanical Computer.” Since then, programming became the main field for logical analysis and implementation of source codes on machines.

### 1. Programming Era (1957-59):

FORTAN (Formula Translation), LISP (List Processor) and COBOL(Common Business-Oriented Language) are well-thought-out to be the ancient languages that are still used today.

Primary Uses: Supercomputing Applications, Artificial Intelligence Development, and Business Software.

Used by: Nowadays, NASA, different credit cards, and ATMs are using one or a combination of these languages.

## 2. Programming Era (1970):

Niklaus Wirth created Pascal (After French mathematician/Physicist Blaise Pascal) back in 1970. It is a high-level language, used for educating structured programming and data structuring. The public versions of this language were in use in late 1980's.

Primary Uses: Teaching Programming, and Object Pascal

Used by: Apple Lisa (1983) and SKYPE.

## 3. Programming Era (1972):

Dennis Ritchie (Bell labs) created the programming language called C (with the mixed version of earlier language called "B") back in 1972. Often known as low-level language, it commonly created for Unix Systems. Many other languages are known to be the full or half derivatives of C including Java, Perl and PHP.

Primary Uses: Computer Gaming Applications, Unix System Programming and System Development.

Used by: Unix Systems.

#### 4. Programming Era (1983-87):

Bjarne Stroustrup (Bell labs) created the programming language called C++ (with the mixed version of “C including classes”) back in 1983. It is an intermediate-level language with object-orientation and inclusion of classes and other templates.

Brad Cox and Tom Love (Stepstone) created the programming language called Objective-C (with an extension of object-orientation in C language) in 1983. It is a high-level language with an extension of object-orientation in C language and message-passing feature.

Larry Wall (Unisys) created Perl programming language in 1987. It is a high-level programming language used for Unix Systems’ report processing.

Primary Uses: C++ is used for Commercial and Embedded Software Development and Video Gaming. Objective-C is used for Apple Programming. Perl is used for Graphic Programming, Network System Programming, System Development, Administration, Database Development, and Applications.

Used by: Used by IMDB, Amazon, Apple, Adobe and Google Chrome.

## 5. Programming Era (1990-95):

Guido Van Rossum (CWI) created the programming language Python back in 1991. It is general-purpose and high-level language for introducing different programming styles within a same language.

Yukihiro Matsumoto created RUBY in 1993. It is also a high-level language and is used for teaching programming and to run entertaining programming techniques.

James Gosling (Sun Microsystems) created Java programming language in 1995. It is a high-level programming language used for collaborative TV project with cross-platform feature. It is also known as the world's famous Programming language nowadays.

Rasmus Lerdorf created PHP (Previously known as “Personal Home page” but now “Hypertext preprocessor”) in 1995. An open-source language with Web-pages building functionality.

Brendan Eich (Netscape) created JavaScript in 1995. It is known as the final choice after “Mocha” and “LiveScript.” It is also a high-level programming language for designing webpages, animations, and interactivity.

Primary Uses: Python is used for Information Security and Web Applications. Ruby is used for Ruby on Rails and Web Development. Java is highly used for Network programming, GUI development and Software Development. PHP is used for server-side development and Webpages. JavaScript is used for PDF, Web browsers, and Web Development.

Used by: Used by Gmail, Adobe, Facebook, Digg, WordPress, Android, Google, Yahoo, Hulu, Twitter and Groupon.

#### Summary of Most Used Languages:

A brief summary for comparing the attributes (in %) of programming languages is mentioned below:

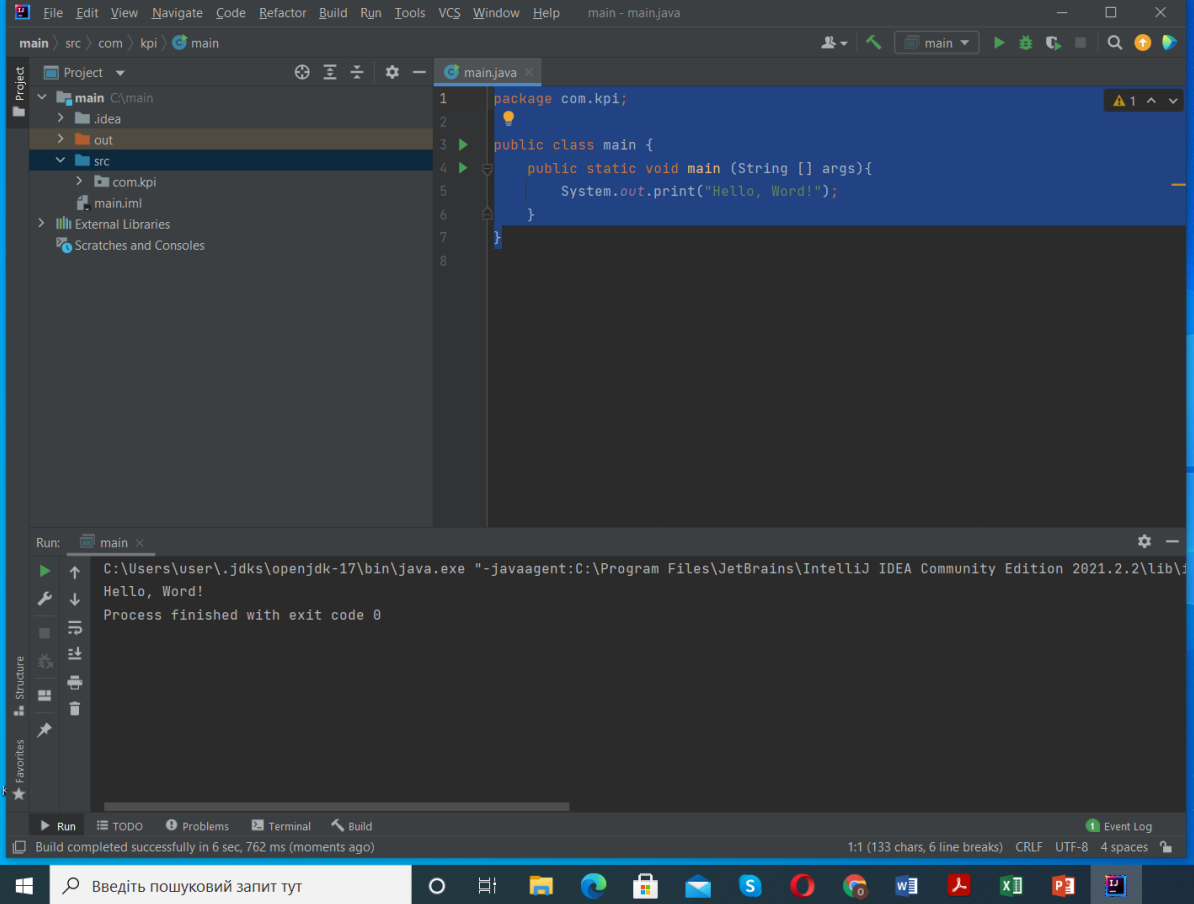
	Java	.NET	C/C++
Code Quality	82 %	73 %	78 %
Cryptographic			
Issues	55 %	62 %	46 %
Information Leakage	58 %	60 %	5 %
Time And State	34 %	30 %	32 %
Directory Traversal	49 %	56 %	40 %
Buffer Overflow	25 %	1 %	48 %
SQL Injection	31 %	30 %	30 %



- **Market Need For Programmers/Future Of Programming:**  
Be it about website development, structural designing, software development, webpage development, Web Browsers Development, Information Security, Data Integrity, ATM communication, Online Banking, Network Programming, Graphical user Interface development, Server-Side Development or Database Administration or Development, market would need programmers. These niches are so well-focused today that there would be numerous versions of the same niche mentioned above in the future.

Every organization or business need some level of technical expertise at programming level for securing their enterprise. Therefore, programmers are in high-demand in each organization and that is just the beginning of the era. Let the entrepreneurs discover more sub-niches and programmers would then be in high demand.

```
package com.kpi;
public class main {
    public static void main (String [] args){
        System.out.print("Hello, Word!");
    }
}
```



The screenshot displays the IntelliJ IDEA IDE interface. The main editor window shows the following Java code in `main.java`:

```
1 package com.kpi;
2
3 public class main {
4     public static void main (String [] args){
5         System.out.print("Hello, Word!");
6     }
7 }
8
```

The Run window at the bottom shows the execution output:

```
Run: main x
C:\Users\user\.jdk\openjdk-17\bin\java.exe "-javaagent:C:\Program Files\JetBrains\IntelliJ IDEA Community Edition 2021.2.2\lib\...
Hello, Word!
Process finished with exit code 0
```

The status bar at the bottom indicates "Build completed successfully in 6 sec, 762 ms (moments ago)".