Basics of JAVA

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Compiler VS Interpreter

Compiled

1. Develop Source Code

MyClass.java

```java
public class MyClass {
  public static void main(String[] args) {
    System.out.println("Hello World");
  }
}
```

2. Compile

```
javac MyClass.java
```

MyClass.class

3. Run

```
java MyClass
```

Hello World

Interpreted

1. Develop Source Code

main.py

```
def print_message():
    print("Hello World")


if __name__ == '__main__':
    print_message()
```

2. Run

```
python main.py
Hello World
```

Code

main.py

```
def print_message():
    print("Hello World")


if __name__ == '__main__':
    print_message()
```

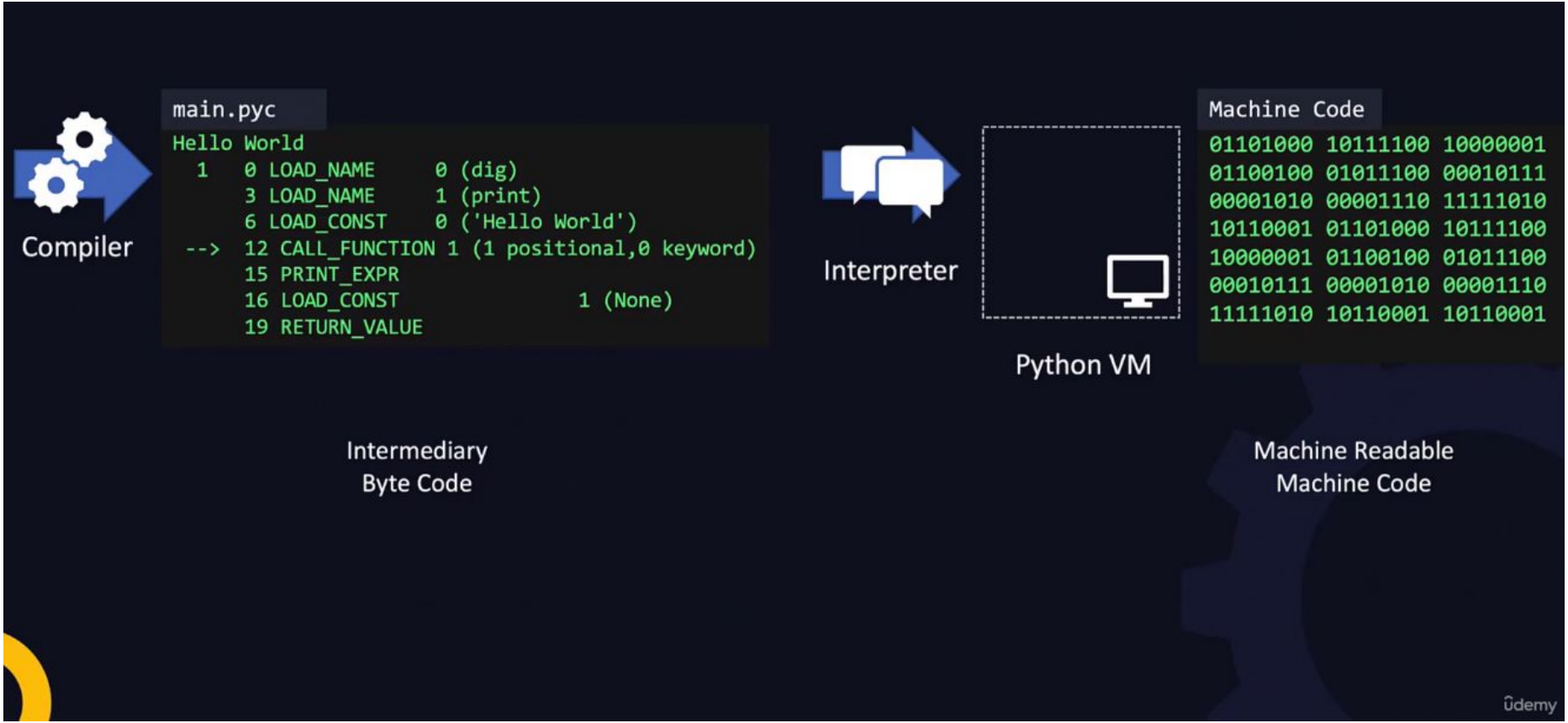
Compiler

Machine Code

```
01101000 10111100 10000001
01100100 01011100 00010111
00001010 00001110 11111010
10110001 01101000 10111100
10000001 01100100 01011100
00010111 00001010 00001110
11111010 10110001 10110001
```

Human Readable
Source Code

Machine Readable
Machine Code


main.pyc
Hello World
1 0 LOAD_NAME 0 (dig)
3 LOAD_NAME 1 (print)
6 LOAD_CONST 0 ('Hello World')
--> 12 CALL_FUNCTION 1 (1 positional,0 keyword)
15 PRINT_EXPR
16 LOAD_CONST 1 (None)
19 RETURN_VALUE
Compiler
Interpreter
Python VM
Machine Code
01101000 10111100 10000001
01100100 01011100 00010111
00001010 00001110 11111010
10110001 01101000 10111100
10000001 01100100 01011100
00010111 00001010 00001110
11111010 10110001 10110001
Intermediary
Byte Code
Machine Readable
Machine Code
ûdemy

Compiled	Interpreted

C

C++

Basics of Application

Libraries: Libraries, often referred to as software libraries or simply libs, are collections of pre-written code and functions that can be reused in various programs.

Modules: Modules are individual files containing Python code. They allow you to organize your code into reusable components.

Packages: In many programming languages, packages are a way to group related modules together. For example, in Python, you have packages like NumPy for numerical computing and Pandas for data manipulation.

SDK

Collection of software tools, libraries, and documentation that developers use to create applications for a specific software platform, framework.

SDK helps software developers build their programs faster and better, without starting everything from scratch.

SDKs are vital for developers because they streamline the development process, reduce the need to write code from scratch, and ensure that applications are compatible with the target platform

JDK (Java Development Kit)

JDK is a software package provided by Oracle (and other organizations like OpenJDK) that includes tools and binaries necessary for developing, compiling, and running Java applications.

It includes the Java compiler (javac), the Java Virtual Machine (java), libraries, and various development tools like javap for disassembling class files.

JDK is primarily used for Java application development

Java Development Kit (JDK)

Develop

- jdb
- javadoc

Build

- javac
- jar

Run

- JRE

(Java Runtime Environment)

- java

```
ls jdk-13.0.2/bin
```

```
jaotc       javadoc   jdeprscan jinfo   jps         jstatd    rmiregistry
jar         javap     jdeps     jjs     jrunscript  keytool   serialver
jarsigner   jcmd      jfr       jlink   jshell      pack200   unpack200
java        jconsole  jhsdb     jmap    jstack      rmic
javac       jdb       jimage.   jmod    jstat       rmid
```

Build Process

Develop

Compile

Package

Document

```
javac MyClass.java
```

```
jar cf MyClass.jar ..
```

```
javadoc MyClass.java
```

Package

META-INF/MANIFEST.MF

```
Manifest-Version: 1.0
Created-By: 1.8.0_242 (Private Build)
Main-Class: MyClass
```

Java Archive (JAR)

Web Archive (WAR)

```
jar cf MyApp.jar MyClass.class Service1.class Service2.class ...
```

```
MyApp.jar
```

```
java -jar MyApp.jar
```

```
Hello World
```