

just enough

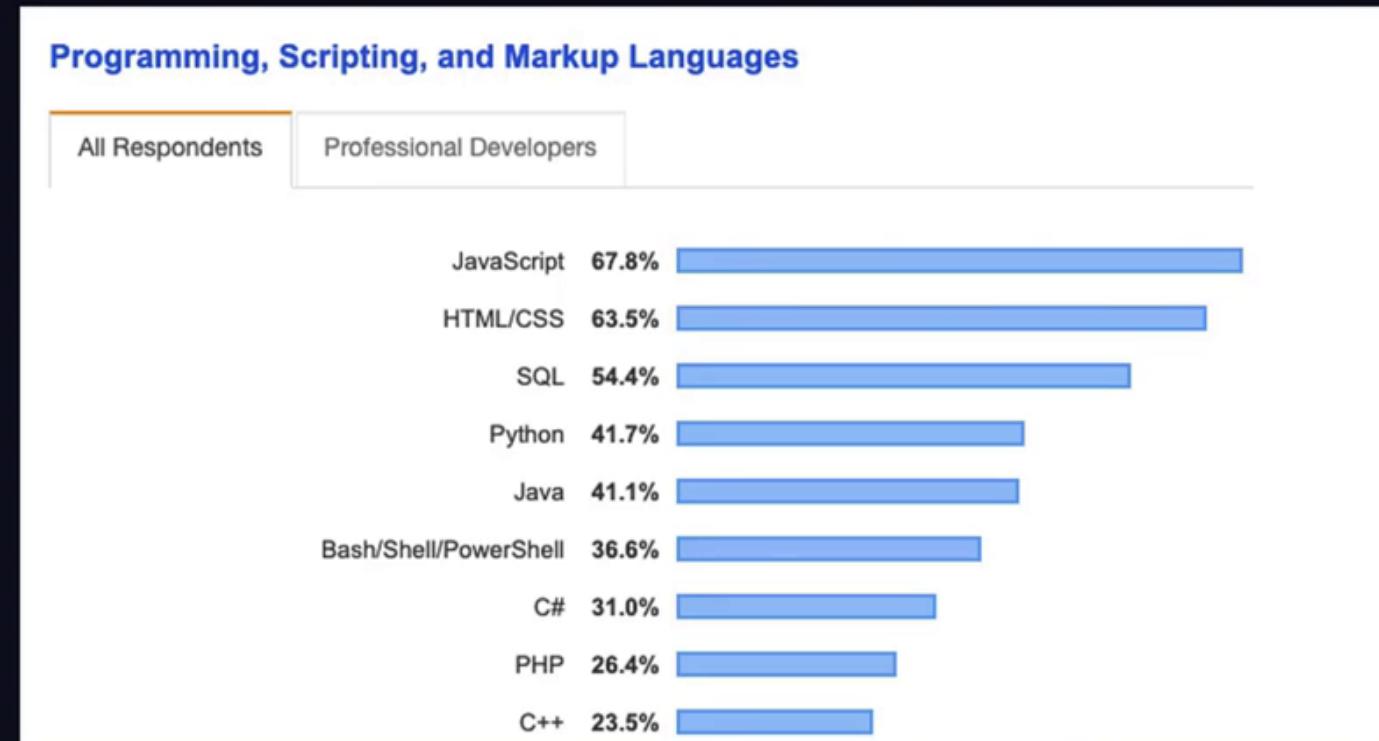
Applications

Introduction

- Who is this for?
 - Non-Developers
- Different types of programming languages
 - Python
 - NodeJS
 - Java
- Building and Deploying them
- Troubleshooting Applications
- Labs

Programming Languages

- JavaScript – NodeJS
- Python
- Java



Programming Languages

- JavaScript – NodeJS
- Python
- Java



Types

Compiled

Interpreted



C

C++



Compiled

1. Develop Source Code

2. Compile

3. Run



Compiled

1. Develop Source Code

MyClass.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()
```

Human Readable
Source Code



Compiler

Machine Code

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

Machine Readable
Machine Code

Code

```
main.py

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

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



Compiler

```
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
```

Human Readable
Source Code

Intermediary
Byte Code

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

Machine Readable
Machine Code



Compiler

main.py

```
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
```

Intermediary
Byte Code



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
```

Machine Readable
Machine Code

Virtual Machine



Compiler

main.py

```
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
```

Intermediary
Byte Code



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
```

Machine Readable
Machine Code

Virtual Machine



Compiler

main.py

```
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
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Intermediary
Byte Code



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
```

Machine Readable
Machine Code

▶ python main.py
Hello World

Packages/Modules/Libraries

- Filesystems
- Math
- Operating system
- HTTP
- Security
- Networking



Build

- Compile
 - Run Tests
 - Package
 - Delivery
-
- Check build procedure for different types of applications:
 - Python
 - Java
 - NodeJS

just enough



Introduction

About Java

- Free
- Open-source
- Huge Community



Version	Date
13	2019
12	2019
11	2018
10	2018
9	2017
8	2014
7	2011
6	2006
5	2004

Install Java

```
▶ wget https://download.java.net....  
openjdk-13.0.2_linux-x64_bin.tar.gz
```

```
▶ tar -xvf openjdk-13.0.2_linux-x64_bin.tar.gz  
/opt/jdk-13/bin/java -version
```

```
▶ jdk-13.0.2/bin/java -version  
openjdk version "13.0.2" 2020-01-14  
OpenJDK Runtime Environment (build 13.0.2+8)  
OpenJDK 64-Bit Server VM (build 13.0.2+8, mixed mode,  
sharing)
```

```
▶ java -version  
openjdk version "1.8.0_242"  
OpenJDK Runtime Environment (build 1.8.0_242-b08)  
OpenJDK 64-Bit Server VM (build 25.242-b08, mixed mode)
```

jdk.java.net

GA Releases
JDK 13
JMC 7

Early-Access
Releases
JDK 15
JDK 14
JDK 14 macOS
Catalina
jpackage
Loom
OpenJFX
Panama
Valhalla

Reference
Implementations
Java SE 14
Java SE 13
Java SE 12
Java SE 11
Java SE 10
Java SE 9
Java SE 8
Java SE 7

Feedback
Report a bug
Archive

JDK 13.0.2 General-Availability Release

Schedule, status, & features (OpenJDK)

Documentation

- Release notes
- API Javadoc

Build 8 (2019/12/11): General Availability

- Changes in this build
- Issues addressed in this build

These open-source builds are provided under the GNU General Public License, version 2, with the Classpath Exception.

Linux/x64	tar.gz (sha256)	195812001 bytes
macOS/x64	tar.gz (sha256)	189969691
Windows/x64	zip (sha256)	195969512

Commercial builds of JDK 13.0.2 from Oracle under a non-open-source license, for a wider range of platforms, can be found at the Oracle Technology Network.

Notes

<https://jdk.java.net/13/>

Install Java

```
▶ wget https://download.java.net....  
openjdk-13.0.2_linux-x64_bin.tar.gz
```

```
▶ tar -xvf openjdk-13.0.2_linux-x64_bin.tar.gz  
/opt/jdk-13/bin/java -version
```

```
▶ jdk-13.0.2/bin/java -version  
openjdk version "13.0.2" 2020-01-14  
OpenJDK Runtime Environment (build 13.0.2+8)  
OpenJDK 64-Bit Server VM (build 13.0.2+8, mixed mode,  
sharing)
```

```
▶ java -version  
openjdk version "1.8.0_242"  
OpenJDK Runtime Environment (build 1.8.0_242-b08)  
OpenJDK 64-Bit Server VM (build 25.242-b08, mixed mode)
```

jdk.java.net

GA Releases
JDK 13
JMC 7

Early-Access
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JDK 15
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- Changes in this build
- Issues addressed

Version	Name
13	13
12	12
11	11
10	10
9	9
8	1.8
7	1.7
6	1.6
5	1.5

These open-source builds are based on the Java SE 13 API Specification and Java Platform, Standard Edition 13 Platform Specification.

Java SE 13 is released under the Apache License, Version 2.0, with the Java SE 13 API Specification released under the same license.

Java SE 12 is released under the Apache License, Version 2.0, with the Java SE 12 API Specification released under the same license.

Java SE 11 is released under the Apache License, Version 2.0, with the Java SE 11 API Specification released under the same license.

Java SE 10 is released under the Apache License, Version 2.0, with the Java SE 10 API Specification released under the same license.

Java SE 9 is released under the Apache License, Version 2.0, with the Java SE 9 API Specification released under the same license.

Java SE 8 is released under the Apache License, Version 2.0, with the Java SE 8 API Specification released under the same license.

Java SE 7 is released under the Apache License, Version 2.0, with the Java SE 7 API Specification released under the same license.

<https://jdk.java.net/13/>

🔧 Java Development Kit (JDK)

Develop

Build

Run



jdb



javac



JRE



javadoc



jar

(Java Runtime Environment)

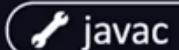


Java Development Kit (JDK)

Develop



Build



Run



(Java Runtime Environment)



```
▶ ls jdk-13.0.2/bin
```

jaotc	javadoc	jdeprscan	jinfo	jps	jstard	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	

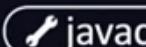
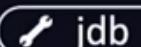
Before v9

Java Development Kit (JDK)

Develop

Build

Run



JRE

(Java Runtime Environment)

Download JDK

.tar.gz - 188 MB

[Checksum](#)

Download JRE

.tar.gz - 38 MB

[Checksum](#)

After v9

Java Development Kit (JDK)

Develop



jdb

Build



javac

Run



JRE

(Java Runtime Environment)



ChatGPT

Playground | Killer Shell CKA | K

killercode.com/killer-shell-cka/scenario/playground

Play with Kubernetes ASCII Generator Play with Docker (4) CNCF [Cloud Na... Home | Microsoft 365 bmuschko (Benjami... sandervanvugt Trello fe All Bookmarks

K L L K C O D A Twitter LinkedIn PLUS

Editor Tab1 + Areas Account Creator Logout 60 min

Initialising Kubernetes... done

controlplane \$ java -version

Command 'java' not found, but can be installed with:

```
apt install openjdk-11-jre-headless # version 11.0.20.1+1-0ubuntu1~20.04, or  
apt install default-jre # version 2:1.11-72  
apt install openjdk-16-jre-headless # version 16.0.1+9-1~20.04  
apt install openjdk-17-jre-headless # version 17.0.8.1+1~us1-0ubuntu1~20.04  
apt install openjdk-8-jre-headless # version 8u382-ga-1~20.04.1  
apt install openjdk-13-jre-headless # version 13.0.7+5-0ubuntu1~20.04
```

controlplane \$ |

https://killercode.com/creator/scenarios

Type here to search

6:46 AM 12/24/2023

ChatGPT

Playground | Killer Shell CKA | K

killercoda.com/killer-shell-cka/scenario/playground

Play with Kubernetes ASCII Generator Play with Docker (4) CNCF [Cloud Na... Home | Microsoft 365 bmuschko (Benjami... sandervanvugt Trello fe All Bookmarks

K L L K C O D A Areas Account Creator Logout 52 min

Editor Tab 1 +

```
controlplane $  
controlplane $ cat HelloWorld.java  
public class HelloWorld {  
    public static void main(String[] args) {  
        System.out.println("Hello, World!");  
    }  
}  
  
controlplane $  
controlplane $ javac HelloWorld.java  
controlplane $  
controlplane $ java HelloWorld  
Hello, World!  
controlplane $  
controlplane $ /usr/lib/jvm/java-17-openjdk-amd64/  
bin/ conf/ docs/ include/ jmods/ legal/ lib/ man/  
controlplane $ /usr/lib/jvm/java-17-openjdk-amd64/bin/  
jar javadoc jdeprscan jimage jmod jshell keytool  
jarsigner javap jdeps jinfo jpckage jstack rmiregistry  
java jcml jfr jlink jps jstat serialver  
javac jdb jhsdb jmap jrunkscript jstard  
controlplane $ /usr/lib/jvm/java-17-openjdk-amd64/bin/
```

Type here to search

Sunrise 6:54 AM 12/24/2023

Compile

1. Develop Source Code

MyClass.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

Compile

MyClass.java

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



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

Java Virtual Machine

MyClass.java

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



Compiler

MyClass.class

```
0:  iconst_2  
1:  istore_1  
2:  iload_1  
3:  sipush 1000  
6:  if_icmpge 44  
9:  iconst_2  
10:  istore_2  
11:  iload_2  
12:  iload_1  
13:  if_icmpge 31
```



JVM

Human Readable
Source Code

Intermediary
Byte Code

Machine Code

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

Machine Readable
Machine Code

► javac MyClass.java

MyClass.class

Java Virtual Machine

MyClass.java

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



Compiler

MyClass.class

```
0:  iconst_2  
1:  istore_1  
2:  iload_1  
3:  sipush 1000  
6:  if_icmpge 44  
9:  iconst_2  
10: istore_2  
11: iload_2  
12: iload_1  
13: if_icmpge 31
```

Human Readable
Source Code

Intermediary
Byte Code

Machine Code

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

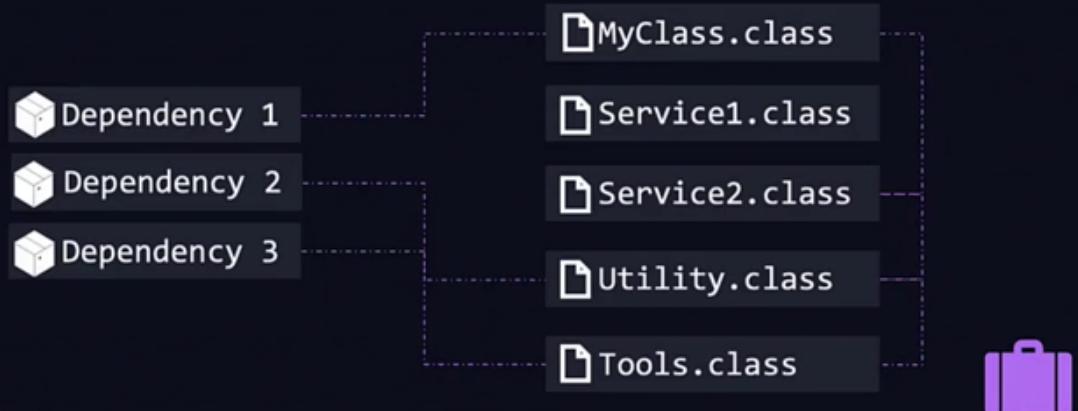
JVM

Machine Readable
Machine Code

► javac MyClass.java
MyClass.class

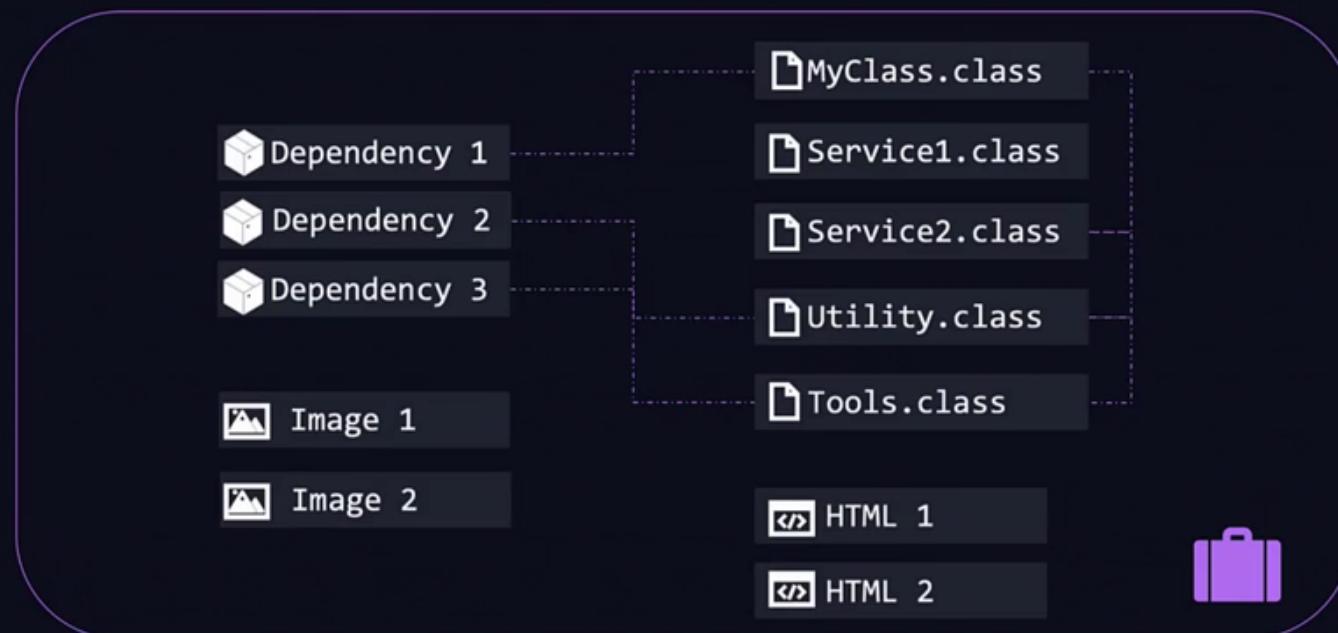
► java MyClass
Hello World

Package



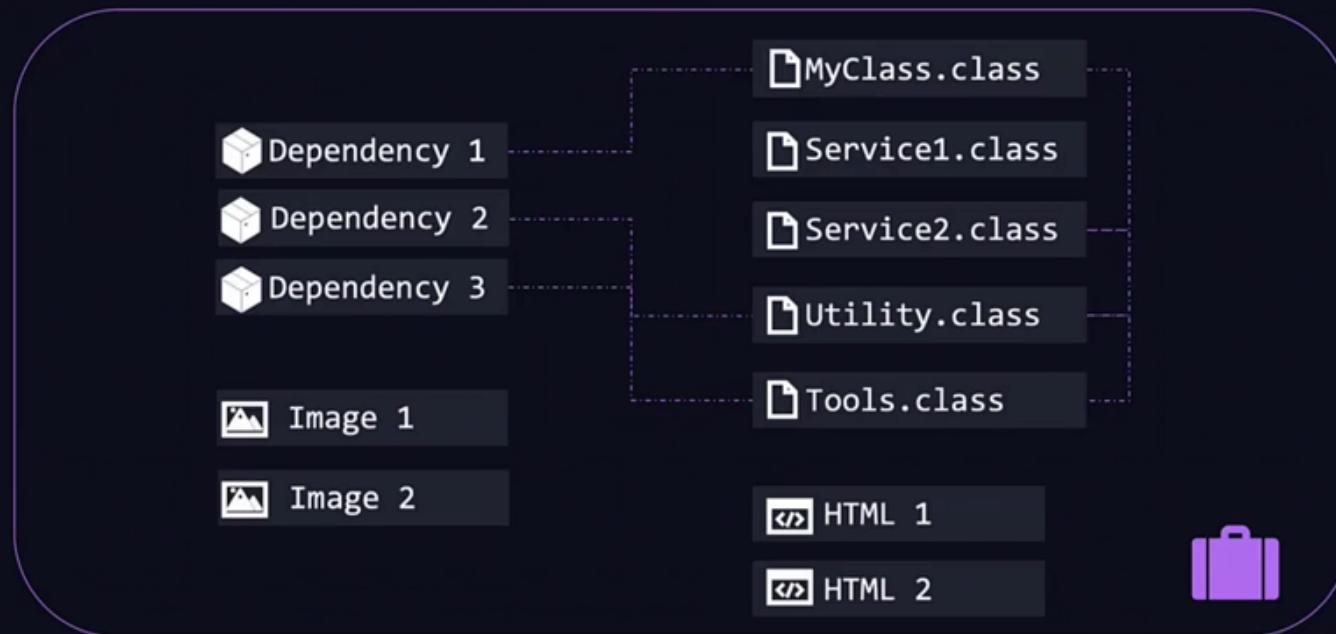
Java Archive
(JAR)

Package



Java Archive Web Archive
(JAR) (WAR)

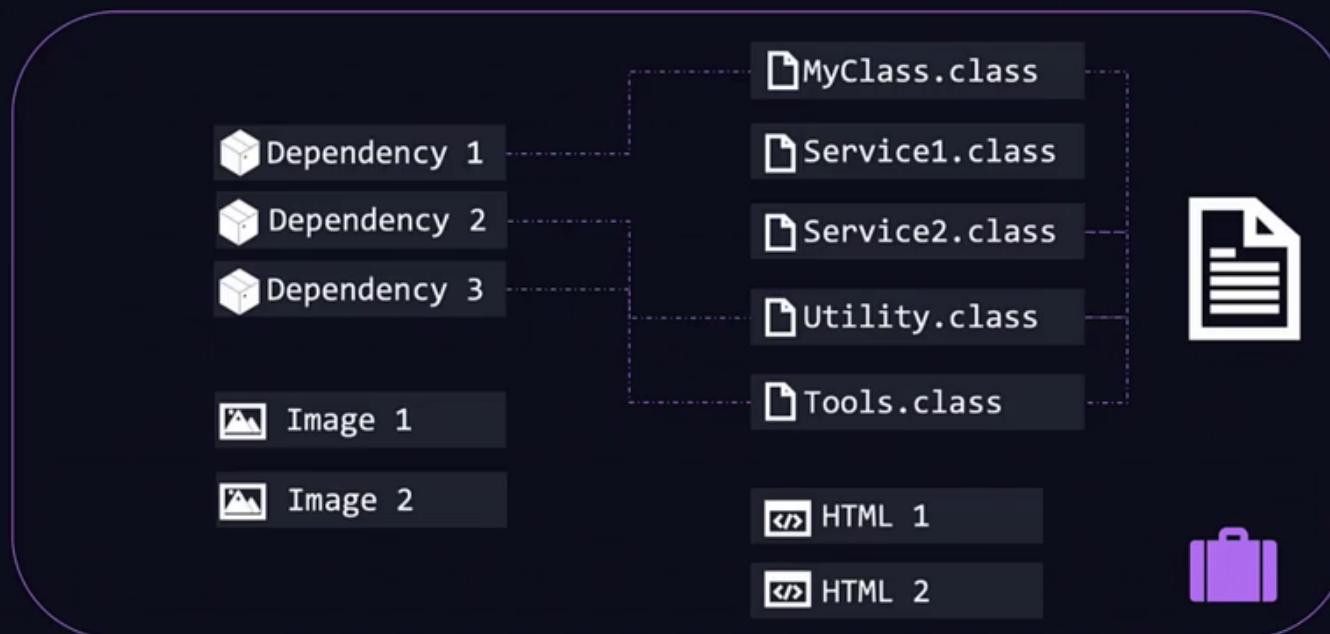
Package



Java Archive
(JAR) Web Archive
(WAR)

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

Package



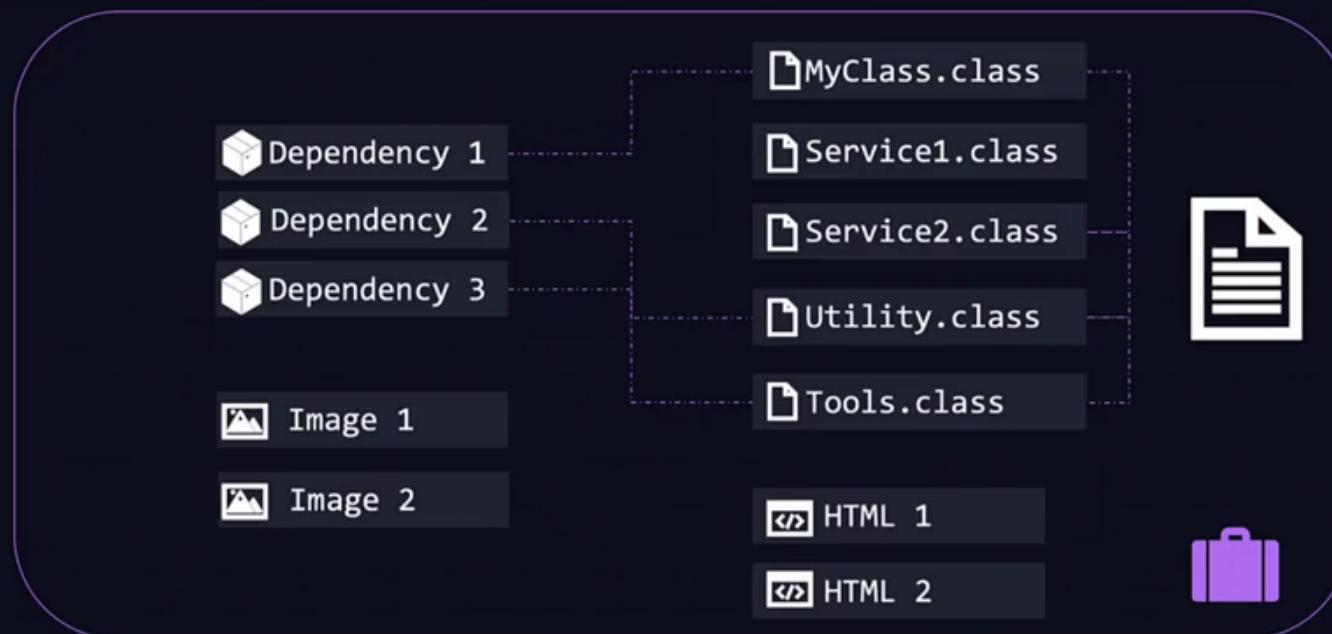
META-INF/MANIFEST.MF

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

Java Archive Web Archive
(JAR) (WAR)

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

Package



META-INF/MANIFEST.MF

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

Java Archive Web Archive
(JAR) (WAR)

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

```
► java -jar MyApp.jar  
Hello World
```

Document

```
▶ javadoc -d doc MyClass.java
```

PACKAGE CLASS TREE DEPRECATED INDEX HELP

PREV CLASS NEXT CLASS FRAMES NO FRAMES

SUMMARY: NESTED | FIELD | CONSTR | METHOD DETAIL: FIELD | CONSTR | METHOD

Class MyClass

java.lang.Object
MyClass

```
public class MyClass
extends java.lang.Object
```

Prints Hello World Message

Constructor Summary

Constructors

Constructor and Description

MyClass()

Build Process



Develop



Compile



Package



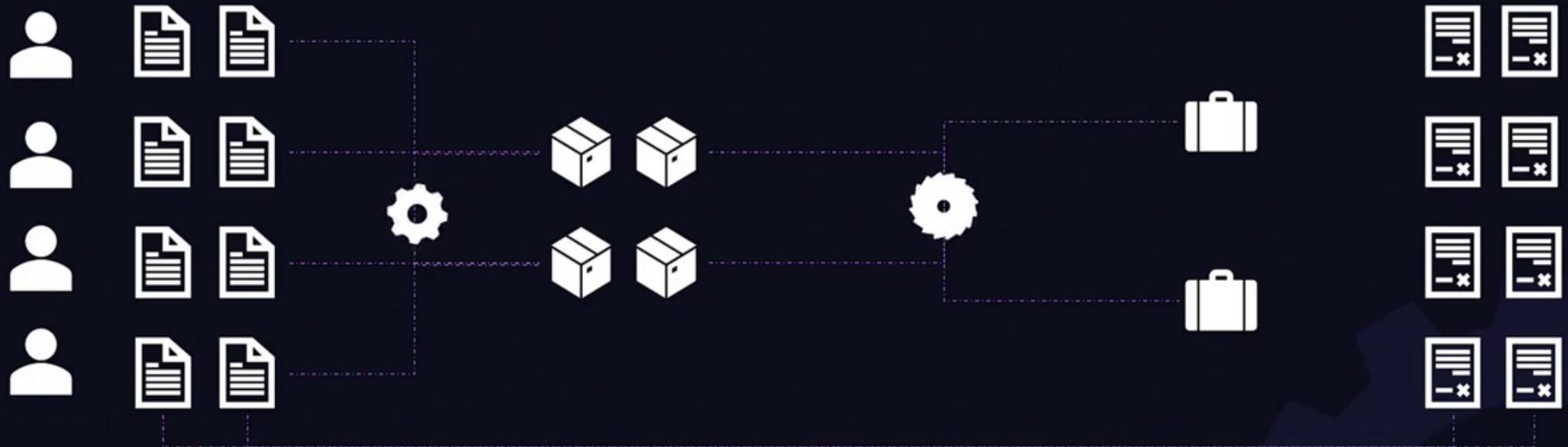
Document

► javac MyClass.java

► jar cf MyClass.jar ..

► javadoc MyClass.java

Build Process



Build Tools

- Maven
- Gradle
- ANT

Build Tools

- Maven
- Gradle
- ANT

```
# Build Steps
```

```
1.Compile
```

```
2.Package
```

```
3.Document
```

ANT

build.xml

```
<?xml version="1.0"?>
<project name="Ant" default="main" basedir=".">
    <!-- Compiles the java code (including the usage of Library for JUnit -->
    <target name="compile">
        <javac srcdir="/app/src" destdir="/app/build">
            </javac>
    </target>
    <!-- Creates Javadoc -->
    <target name="docs" depends="compile">
        <javadoc packagenames="src" sourcepath="/app/src" destdir="/app/docs">
            <!-- Define which files / directory should get included, we include all -->
            <fileset dir="/app/src">
                <include name="**" />
            </fileset>
        </javadoc>
    </target>
    <!--Creates the deployable jar file -->
    <target name="jar" depends="compile">
        <jar basedir="/app/build" destfile="/app/dist/MyClass.jar" >
            <manifest>
                <attribute name="Main-Class" value="MyClass" />
            </manifest>
        </jar>
    </target>
    <target name="main" depends="compile, jar, docs">
        <description>Main target</description>
    </target>
</project>
```

▶ javac MyClass.java

▶ javadoc MyClass.java

▶ jar cf MyClass.jar ..

ANT

build.xml

```
<?xml version="1.0"?>
<project name="Ant" default="main" basedir=".">
    <!-- Compiles the java code (including the usage of Library for JUnit -->
    <target name="compile">
        <javac srcdir="/app/src" destdir="/app/build">
        </javac>
    </target>
    <!-- Creates Javadoc -->
    <target name="docs" depends="compile">
        <javadoc packagenames="src" sourcepath="/app/src" destdir="/app/docs">
            <!-- Define which files / directory should get included, we include all -->
            <fileset dir="/app/src">
                <include name="**" />
            </fileset>
        </javadoc>
    </target>
    <!--Creates the deployable jar file -->
    <target name="jar" depends="compile">
        <jar basedir="/app/build" destfile="/app/dist/MyClass.jar" >
            <manifest>
                <attribute name="Main-Class" value="MyClass" />
            </manifest>
        </jar>
    </target>
    <target name="main" depends="compile, jar, docs">
        <description>Main target</description>
    </target>
</project>
```

▶ javac MyClass.java

▶ javadoc MyClass.java

▶ jar cf MyClass.jar ..

ANT

build.xml

```
<?xml version="1.0"?>
<project name="Ant" default="main" basedir=".">
    <!-- Compiles the java code (including the usage of Library for JUnit -->
    <target name="compile">
        <javac srcdir="/app/src" destdir="/app/build">
        </javac>
    </target>
    <!-- Creates Javadoc -->
    <target name="docs" depends="compile">
        <javadoc packagenames="src" sourcepath="/app/src" destdir="/app/docs">
            <!-- Define which files / directory should get included, we include all -->
            <fileset dir="/app/src">
                <include name="**" />
            </fileset>
        </javadoc>
    </target>
    <!--Creates the deployable jar file -->
    <target name="jar" depends="compile">
        <jar basedir="/app/build" destfile="/app/dist/MyClass.jar" >
            <manifest>
                <attribute name="Main-Class" value="MyClass" />
            </manifest>
        </jar>
    </target>
    <target name="main" depends="compile, jar, docs">
        <description>Main target</description>
    </target>
</project>
```

▶ javac MyClass.java

▶ javadoc MyClass.java

▶ jar cf MyClass.jar ..

ANT

► ant

BUILD SUCCESSFUL

Total time: 2 seconds

► javac MyClass.java

► javadoc MyClass.java

► jar cf MyClass.jar ..

build.xml

```
<?xml version="1.0"?>
<project name="Ant" default="main" basedir=".">
    <!-- Compiles the java code (including the usage of Library for JUnit -->
    <target name="compile">
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        </javac>
    </target>
    <!-- Creates Javadoc -->
    <target name="docs" depends="compile">
        <javadoc packagenames="src" sourcepath="/app/src" destdir="/app/docs">
            <!-- Define which files / directory should get included, we include all -->
            <fileset dir="/app/src">
                <include name="**" />
            </fileset>
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    <target name="jar" depends="compile">
        <jar basedir="/app/build" destfile="/app/dist/MyClass.jar" >
            <manifest>
                <attribute name="Main-Class" value="MyClass" />
            </manifest>
        </jar>
    </target>
    <target name="main" depends="compile, jar, docs">
        <description>Main target</description>
    </target>
</project>
```

ANT

```
▶ ant compile jar
```

BUILD SUCCESSFUL

Total time: 2 seconds

```
▶ javac MyClass.java
```

```
▶ javadoc MyClass.java
```

```
▶ jar cf MyClass.jar ..
```

build.xml

```
<?xml version="1.0"?>
<project name="Ant" default="main" basedir=".">
    <!-- Compiles the java code (including the usage of Library for JUnit -->
    <target name="compile">
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        </javac>
    </target>
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            <fileset dir="/app/src">
                <include name="**" />
            </fileset>
        </javadoc>
    </target>
    <!--Creates the deployable jar file -->
    <target name="jar" depends="compile">
        <jar basedir="/app/build" destfile="/app/dist/MyClass.jar" >
            <manifest>
                <attribute name="Main-Class" value="MyClass" />
            </manifest>
        </jar>
    </target>
    <target name="main" depends="compile, jar, docs">
        <description>Main target</description>
    </target>
</project>
```

Maven

Branch: 2.9.0 → shopizer / pom.xml

Dima removed duplicate dependencies

4 contributors

677 lines (592 sloc) | 20.7 KB

```
1 <?xml version="1.0" encoding="UTF-8"?>
2 <project xmlns="http://maven.apache.org/POM/4.0.0"
3   xsi:schemaLocation="http://maven.apache.org/POM/4.0.0 http://maven.a
4   xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance">
5   <modelVersion>4.0.0</modelVersion>
6
7   <groupId>com.shopizer</groupId>
8   <artifactId>shopizer</artifactId>
9   <version>2.9.0</version>
10  <packaging>pom</packaging>
11
12  <name>shopizer</name>
13  <url>http://maven.apache.org</url>
14
15  <licenses>
16    <license>
17      <name>Apache License, Version 2.0</name>
18      <url>https://www.apache.org/licenses/LICENSE-2.0.txt</url>
19    </license>
20  </licenses>
21
```

Get the code:

Clone the repository:

```
$ git clone git://github.com/shopizer-ecomm
```

If this is your first time using Github, review <http://help.github.com>

You can also download the zip file containing the code

To build the application:

From the command line with Maven installed:

```
$ cd shopizer
$ mvnw clean install
```

Gradle

Branch: master ▾ docker-java-sample / build.gradle

 arun-gupta upgrading the version to 3.0.6

2 contributors 

45 lines (35 sloc) | 961 Bytes

```
1 buildscript {  
2     repositories {  
3         jcenter()  
4     }  
5  
6     dependencies {  
7         classpath 'com.bmuschko:gradle-docker-plugin:3.0.6'  
8     }  
9 }  
10  
11 apply plugin: 'java'  
12 apply plugin: 'application'  
13 apply plugin: 'com.bmuschko.docker-java-application'  
14  
15 import com.bmuschko.gradle.docker.tasks.container.*  
16 import com.bmuschko.gradle.docker.tasks.image.*  
17
```

Gradle

Classical

1. Build app: `./gradlew build`

2. Run app: `./gradlew run`

Summary

- Java
- Java Runtime Environment
- Java Development Kit
- Compiling a Java application
- Packaging a given application to JARs
- What are Build Tools?

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Editor Tab1 +

```
controlplane $  
controlplane $  
controlplane $  
controlplane $  
controlplane $  
controlplane $ cat NamePrint.java  
public class NamePrint {  
    public static void main(String[] args) {  
        // Print the desired statement  
        System.out.println("My name is Sanjeev Thapa.");  
    }  
}  
  
controlplane $ javac NamePrint.java  
controlplane $ echo $?  
0  
controlplane $  
controlplane $ java NamePrint  
My name is Sanjeev Thapa.  
controlplane $  
controlplane $  
controlplane $ jar cf NamePrint.jar NamePrint.class  
controlplane $  
controlplane $ ls  
NamePrint.class NamePrint.jar NamePrint.java filesystem  
controlplane $ java -jar NamePrint.jar  
no main manifest attribute, in NamePrint.jar  
controlplane $
```

Type here to search

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```
Editor Tab1 +
controlplane $ 
controlplane $ 
controlplane $ 
controlplane $ 
controlplane $ ls
File1.java File2.java File3.java Manifest.txt
controlplane $ cat File1.java
public class File1 {
    public static void main(String[] args) {
        System.out.println("This is File1.");
    }
}
controlplane $ cat File2.java
public class File2 {
    public static void main(String[] args) {
        System.out.println("This is File2.");
    }
}
controlplane $ cat File3.java
public class File3 {
    public static void main(String[] args) {
        System.out.println("This is File3.");
    }
}
controlplane $ cat Manifest.txt
controlplane $ 
controlplane $ 
controlplane $ 
```

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K L L K C O D A Twitter LinkedIn Plus Areas Account Creator Logout 25 min

```
Editor Tab1 +
controlplane $
controlplane $
controlplane $ # Compile the Java files
controlplane $ javac File1.java File2.java File3.java
controlplane $
controlplane $
controlplane $ # Create the JAR with the manifest file
controlplane $ jar cfm MySampleJar.jar Manifest.txt File1.class File2.class File3.class
controlplane $
controlplane $ java -jar MySampleJar.jar
no main manifest attribute, in MySampleJar.jar
controlplane $
```

Type here to search

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K L L K C O D A Areas Account Creator Logout 21 min

Editor Tab 1 +

```
controlplane $  
controlplane $ #javadoc -d doc File2.java File3.java  
controlplane $ ls  
File1.class File2.class File3.class Manifest.txt doc  
File1.java File2.java File3.java MySampleJar.jar  
controlplane $  
controlplane $ ls doc/  
File2.html index-all.html overview-tree.html script.js  
File3.html index.html package-search-index.js search.js  
allclasses-index.html jquery-ui.overrides.css package-summary.html stylesheet.css  
allpackages-index.html legal package-tree.html tag-search-index.js  
element-list member-search-index.js resources type-search-index.js  
help-doc.html module-search-index.js script-dir  
controlplane $  
controlplane $  
controlplane $  
controlplane $
```

Type here to search

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JavaScript

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London Calling
 Wrapping up an ambitious reissue program, the great Penelope Fitzgerald delivers not one but two classics in miniature. *The Golden Child* is the British author's first novel, in which an ancient mummy ignites a curatorial ruckus, while *At Freddie's* revolves around a drama academy and its deeply amusing student body. Go to [Books](#)

In Electronics
MiniDisc the Magnificent
 Sony's *Bundle 5 MiniDisc* package harmonizes two separate products—a MiniDisc home recording deck and a portable MiniDisc player—so you can record, edit, and title your own discs from both analog and digital sources, then enjoy them on the go. Go to [Electronics](#)

In Toys & Games
Pack with Pride
 We ain't lion: this adorable *Goliath Backpack Pal* is a great way to scare away those first-day-of-school jitters. Fill his tummy with books, toys, and treats, and this furry beast will be your child's mane man in no time. Go to [Toys & Games](#)

In Video
Texas Two-Step?
 In a stunning admission this week, the FBI confirmed that in 1993 its agents fired flammable devices at the Branch Davidian compound in Waco, Texas, hours before the inferno erupted. But the Oscar-nominated *Waco: The Rules of Engagement* suggested this possibility back in 1997. Check out this fearless documentary and prepare to question the government's spin. Go to [Video](#)

In Music
Industrial Evolution
 They've been accused of being Nine Inch Nails lite, but on *Title of Record*, Filter weld their amped-up techno-metal aggression to an uncanny pop sensibility, creating a memorable set of furious, passionate songs sure to keep the mosh

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3. [Harry Potter and the Chamber of Secrets](#) by J. K. Rowling

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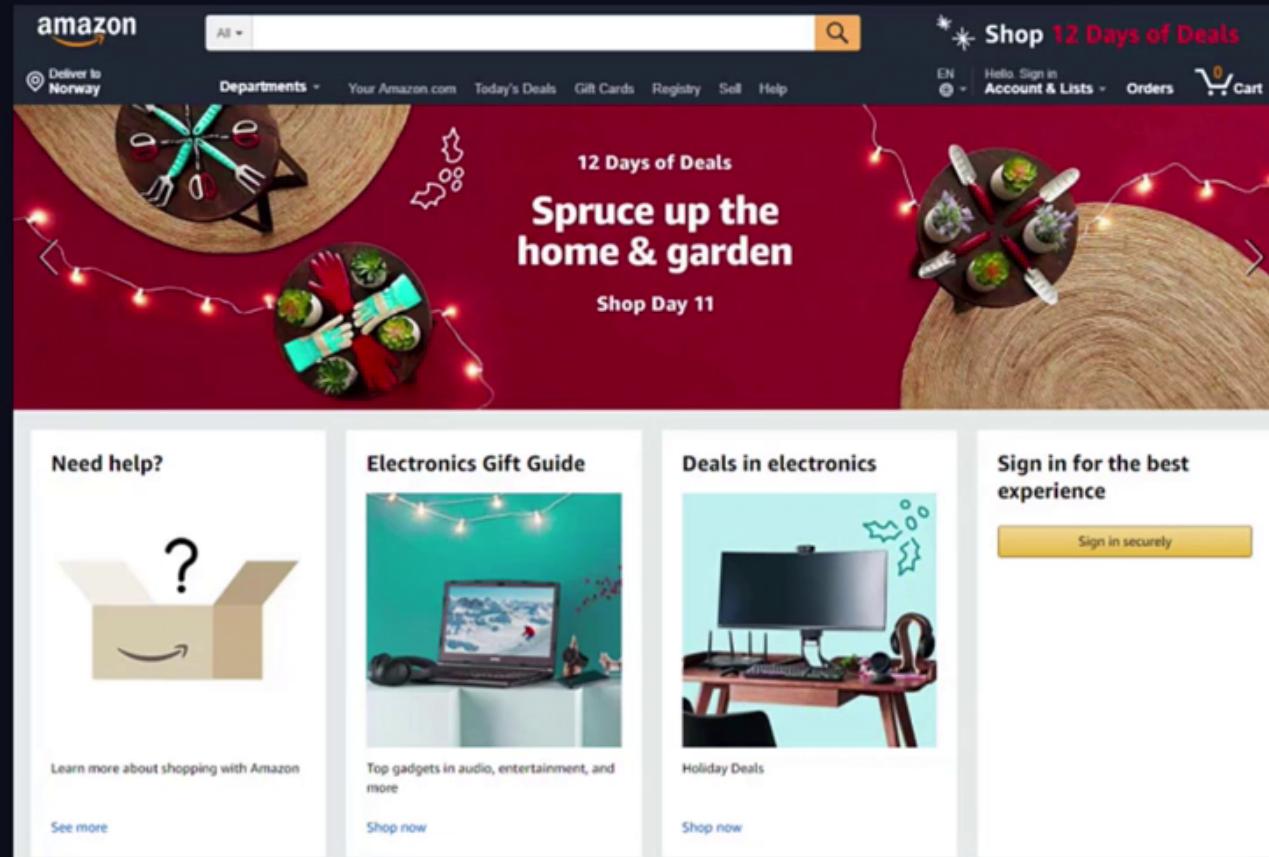
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JavaScript



jQuery

A

atom

V

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NodeJS

- Free
- Open source
- Cross Platform Compatible



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- [Node.js 11.x](#)
- [Node.js 10.x](#)
- [Node.js 9.x](#)
- [Node.js 8.x](#)
- [Node.js 7.x](#)
- [Node.js 6.x](#)
- [Node.js 5.x](#)
- [Node.js 4.x](#)
- [Node.js 0.12.x](#)
- [Node.js 0.10.x](#)

Install NodeJS

NodeSource Node.js Binary Distributions



NODESOURCE



debian



ubuntu®



redhat



CentOS



fedora®

Install NodeJS

NodeSource Node.js Binary Distributions



NODESOURCE



debian

ubuntu®



redhat



CentOS

fedora®

```
► curl -sL https://rpm.nodesource.com/setup_13.x | bash -
```

```
► yum install nodejs
```

NodeJS Commands

```
► node -v
```

```
V13.10.1
```

```
► node add.js
```

```
Addition : 15
```

```
add.js
```

```
// Returns addition of two numbers
let add = function (a, b) {
    return a+b;
};

const a = 10, b = 5;

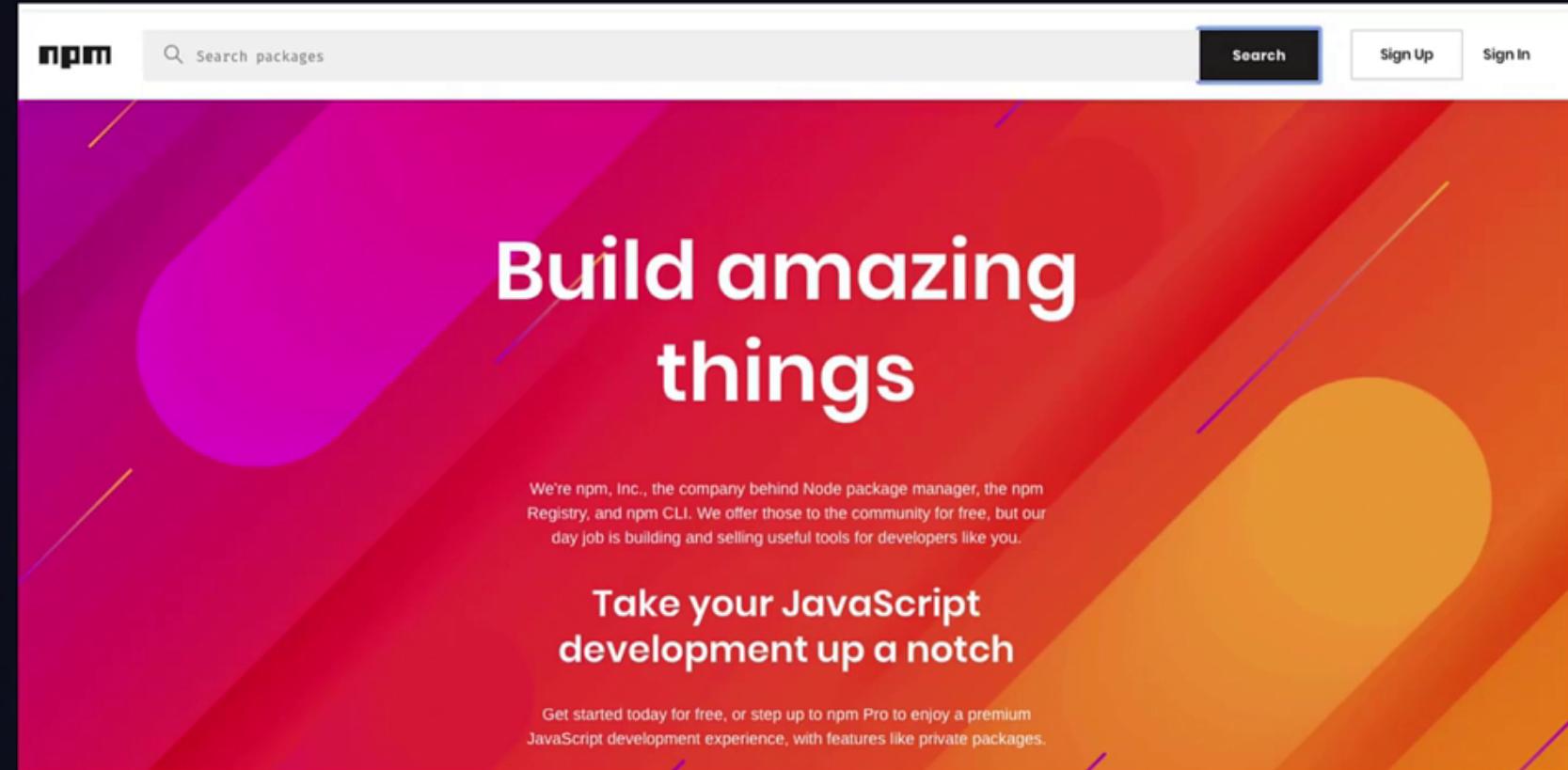
console.log("Addition : "+ add(a,b));
```

just enough



Node Package Manager (NPM)

- Files
- Web Servers
- Databases
- Security
- Many More



NPM Commands

```
▶ npm -v
```

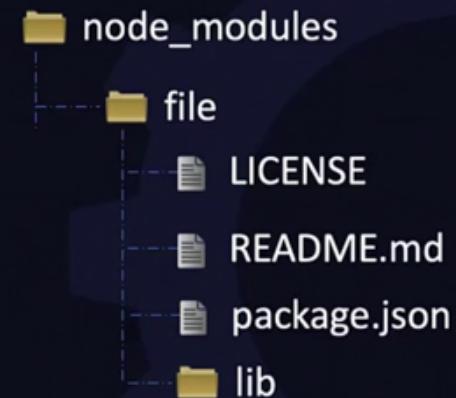
6.13.7

```
▶ npm search file
```

NAME	DESCRIPTION	AUTHOR	DATE
file	Higher level path...	=aconbere	2014-02-21
File	HTML5 FileAPI...	=coolaj86 =narf	2014-10-24
dotenv	Loads environment...	=~jcblw...	2019-10-16
fs-extra	fs-extra contains...	=jprichardson...	2019-06-28
file-loader	A file loader...	=d3viant0ne...	2020-02-19

```
▶ npm install file
```

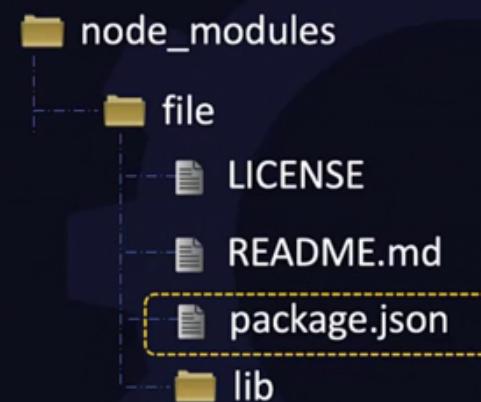
```
+ file@0.2.2  
added 1 package from 1 contributor and audited 1 package in 1.072s  
found 0 vulnerabilities
```



NPM Commands

package.json

```
{  
  "author": {  
    "name": "Anders Conbere",  
    "email": "aconbere@gmail.com"  
  },  
  "bundleDependencies": false,  
  "devDependencies": {  
    "mocha": "1.9.x"  
  },  
  "directories": {  
    "lib": "lib"  
  },  
  "homepage": "https://github.com/aconbere/node-file-utils#readme",  
  "license": "MIT",  
  "main": "./lib/file",  
  "name": "file",  
  "repository": {  
    "type": "git",  
    "url": "git+ssh://git@github.com/aconbere/node-file-utils.git"  
  },  
  "tags": [  
    "file",  
    "path",  
    "fs",  
    "walk"  
  ],  
  "version": "0.2.2"  
}
```



NPM Commands

```
▶ npm install file
+ file@0.2.2
added 1 package from 1 contributor and audited 1 package in 1.072s
found 0 vulnerabilities
```

app.js

```
var file = require("file");
file.mkdirs("/tmp/dir1")
```

my_application

node_modules

file

LICENSE

README.md

package.json

lib

app.js

NPM Commands

```
▶ npm install file
```

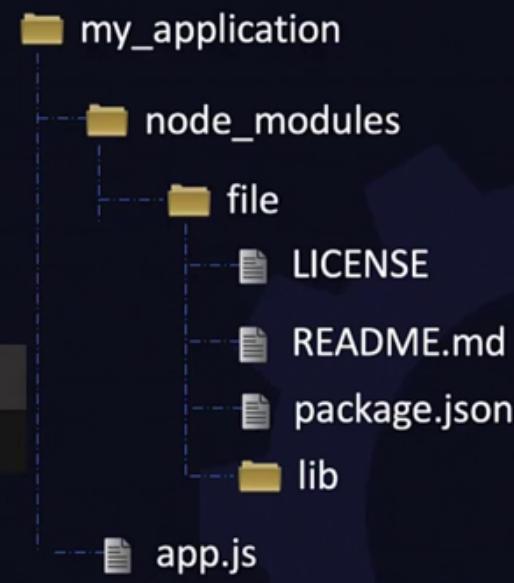
```
+ file@0.2.2  
added 1 package from 1 contributor and audited 1 package in 1.072s  
found 0 vulnerabilities
```

```
app.js
```

```
var file = require("file");  
  
file.mkdirs("/tmp/dir1")
```

```
▶ node -e "console.log(module.paths)"
```

```
[ '/app/node_modules', '/node_modules' ]
```



```
my_application
```

```
node_modules
```

```
file
```

```
LICENSE
```

```
README.md
```

```
package.json
```

```
lib
```

```
app.js
```

NPM Commands

```
▶ npm install file
```

```
+ file@0.2.2  
added 1 package from 1 contributor and audited 1 package in 1.072s  
found 0 vulnerabilities
```

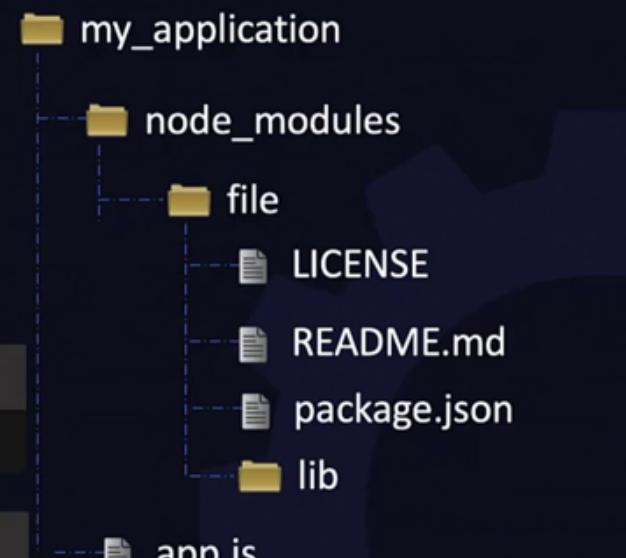
```
app.js
```

```
var file = require("file");  
  
file.mkdirs("/tmp/dir1")
```

```
▶ node -e "console.log(module.paths)"
```

```
[ '/app/node_modules', '/node_modules' ]
```

```
▶ npm install file -g
```



```
my_application
```

```
node_modules
```

```
file
```

```
LICENSE
```

```
README.md
```

```
package.json
```

```
lib
```

```
app.js
```

Common Modules

Built-In Modules		External Modules
fs	To handle filesystem	express
http	To host an HTTP server	react
os	To work with the Operating System	debug
events	To handle events	async
tls	To implement TLS and SSL	lodash
url	To Parse URL Strings	

```
▶ ls /usr/lib/node_modules/npm/node_modules/
```

Common Modules

Built-In Modules		External Modules	
fs	To handle filesystem	express	Fast, unopinionated, minimalist web framework
http	To host an HTTP server	react	To create user interfaces
os	To work with the Operating System	debug	To debug applications
events	To handle events	async	To work with asynchronous JS
tls	To implement TLS and SSL	lodash	To work with arrays, objects, strings etc
url	To Parse URL Strings		

```
▶ ls /usr/lib/node_modules/npm/node_modules/
```

```
▶ ls /usr/lib/node_modules/
```

Application Dependencies

package.json

```
{  
  "name": "example-contentful-theExampleApp-js",  
  "version": "0.0.0",  
  "private": true,  
  "dependencies": {  
    "body-parser": "^1.18.2",  
    "contentful": "^6.0.0",  
    "cookie-parser": "~1.4.3",  
    "dotenv": "^5.0.0",  
    "execa": "^0.9.0",  
    "express": "^4.16.2",  
    "helmet": "^3.11.0",  
    "lodash": "^4.17.5",  
    "marked": "^0.3.16",  
    "morgan": "^1.9.1",  
    "pug": "~2.0.0-beta6"  
  }  
}
```

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```
Editor Tab 1 +  
controlplane $  
controlplane $  
controlplane $  
controlplane $  
controlplane $ node -v  
v10.19.0  
controlplane $ cat add.js  
// AddNumbersStatic.js  
  
// Two static numbers to add  
const number1 = 5;  
const number2 = 4;  
  
// Calculate the sum  
const sum = number1 + number2;  
  
// Print the result  
console.log(`The sum of ${number1} and ${number2} is: ${sum}`);  
controlplane $  
controlplane $ node add.js  
The sum of 5 and 4 is: 9  
controlplane $  
controlplane $  
controlplane $
```

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Editor Tab 1 +

```
controlplane $  
controlplane $  
controlplane $  
controlplane $ #npm search file  
controlplane $  
controlplane $ npm install file  
npm WARN saveError ENOENT: no such file or directory, open '/root/package.json'  
npm notice created a lockfile as package-lock.json. You should commit this file.  
npm WARN enoent ENOENT: no such file or directory, open '/root/package.json'  
npm WARN root No description  
npm WARN root No repository field.  
npm WARN root No README data  
npm WARN root No license field.  
  
+ file@0.2.2  
added 1 package from 1 contributor and audited 1 package in 1.4s  
found 0 vulnerabilities  
  
controlplane $  
controlplane $  
controlplane $  
controlplane $  
controlplane $  
controlplane $
```

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```
Editor Tab 1 +
controlplane $ 
controlplane $ mkdir my_application
mkdir: cannot create directory 'my_application': File exists
controlplane $ 
controlplane $ 
controlplane $ #mkdir my_application
controlplane $ cd my_application/
controlplane $ cat > add.js
// AddNumbersStatic.js

// Two static numbers to add
const number1 = 5;
const number2 = 4;

// calculate the sum
const sum = number1 + number2;

// Print the result
console.log(`The sum of ${number1} and ${number2} is: ${sum}`);
^Z
[1]+  Stopped                  cat > add.js
controlplane $ node add.js
The sum of 5 and 4 is: 9
controlplane $
```

Type here to search

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K L L K C O D A Twitter LinkedIn Plus Areas Account Creator Logout 54 min

Editor Tab 1 + add.js

```
controlplane $ controlplane $ npm install file
npm WARN saveError ENOENT: no such file or directory, open '/root/package.json'
npm WARN enoent ENOENT: no such file or directory, open '/root/package.json'
npm WARN root No description
npm WARN root No repository field.
npm WARN root No README data
npm WARN root No license field.

+ file@0.2.2
updated 1 package and audited 1 package in 0.378s
found 0 vulnerabilities
```

controlplane \$ ls

```
add.js
```

controlplane \$ ls -a

```
.. add.js
```

controlplane \$ node -e "console.log(module.paths)"

```
[ '/root/my_application/node_modules',
  '/root/node_modules',
  '/node_modules' ]
```

controlplane \$

controlplane \$

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Python

- Free
- Open source
- Cross Platform Compatible



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<https://www.python.org/downloads/>

Versions

- Python2 – (2000 – 2010)
- Python3 – (2008 to Present)

Install

```
▶ yum install python2
```

```
▶ python2
```

```
Python 2.7.16 (default, Nov 17 2019, 00:07:27)
[GCC 8.3.1 20190507 (Red Hat 8.3.1-4)] on linux2
Type "help", "copyright", "credits" or "license"
for more information.
>>> exit()
```

```
▶ yum install python36
```

```
▶ python3
```

```
Python 3.6.8 (default, Nov 21 2019, 19:31:34)
[GCC 8.3.1 20190507 (Red Hat 8.3.1-4)] on linux
Type "help", "copyright", "credits" or "license"
for more information.
>>> exit()
```

```
▶ python2 -V
```

```
Python 2.7.16
```

```
▶ python3 -V
```

```
Python 3.6.8
```

Python Commands

```
▶ python2 main.py
```

```
Hello World
```

```
main.py
```

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

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

Python Package Manager (pip)

Python Package Manager (pip)

```
▶ python2 -V
```

```
Python 2.7.16
```

```
▶ python3 -V
```

```
Python 3.6.8
```

```
▶ pip2 -V
```

```
pip 9.0.3 from /usr/lib/python2.7/site-packages  
(python 2.7)
```

```
▶ pip3 -V
```

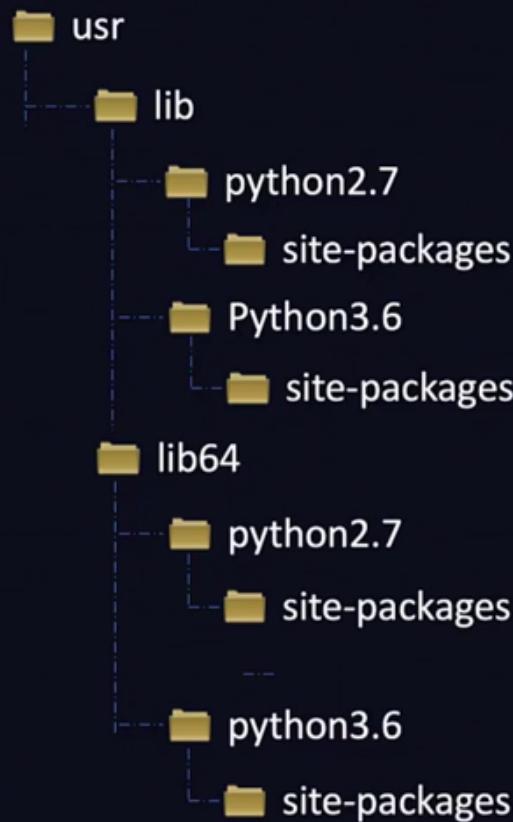
```
pip 9.0.3 from /usr/lib/python3.6/site-packages  
(python 3.6)
```

```
▶ pip -V
```

```
pip 9.0.3 from /usr/lib/python2.7/site-packages (python 2.7)
```

Python Package Manager (pip)

```
▶ pip install flask
```



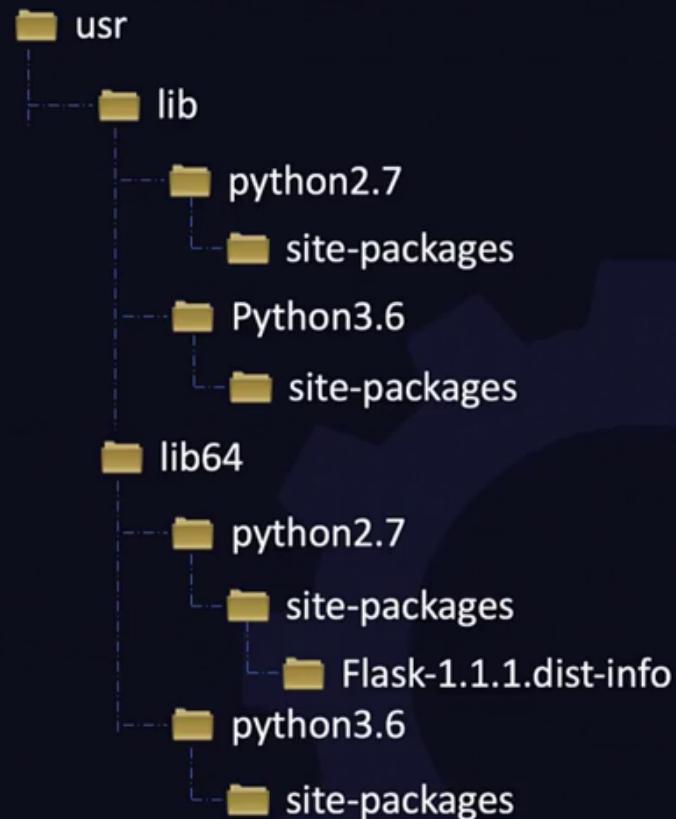
Python Package Manager (pip)

```
▶ pip install flask
```

```
▶ pip show flask
```

```
Name: Flask
Version: 1.1.1
Summary: A simple framework for building complex
web applications.
Home-page: https://palletsprojects.com/p/flask/
Author: Armin Ronacher
Author-email: armin.ronacher@active-4.com
License: BSD-3-Clause
Location: /usr/lib64/python2.7/site-packages
Requires: Werkzeug, click, Jinja2, itsdangerous
```

```
p
```



Python Package Manager (pip)

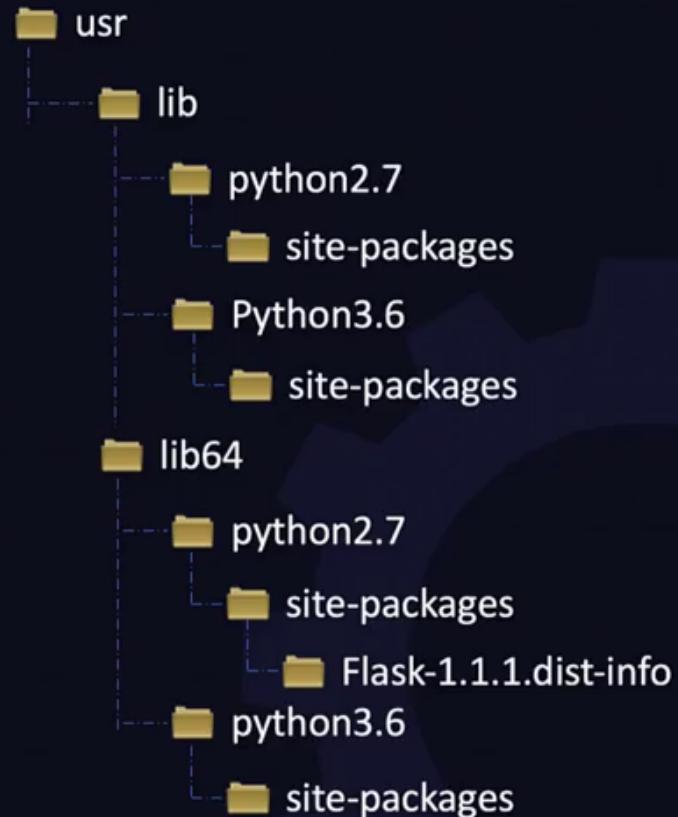
```
▶ pip install flask
```

```
▶ pip show flask
```

```
Name: Flask
Version: 1.1.1
Summary: A simple framework for building complex
web applications.
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Location: /usr/lib64/python2.7/site-packages
Requires: Werkzeug, click, Jinja2, itsdangerous
```

```
▶ python2 -c "import sys; print(sys.path)"
```

```
'/usr/lib/python2.7.zip', '/usr/lib64/python2.7',
'/usr/lib64/python2.7/plat-linux2',
'/usr/lib64/python2.7/lib-tk',
'/usr/lib64/python2.7/lib-old',
'/usr/lib64/python2.7/lib-dynload',
'/usr/lib64/python2.7/site-packages',
'/usr/lib/python2.7/site-packages'
```



Python Package Manager (pip)

```
▶ pip install flask
```

```
▶ pip show flask
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Name: Flask
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```
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'/usr/lib64/python2.7/plat-linux2',
'/usr/lib64/python2.7/lib-tk',
'/usr/lib64/python2.7/lib-old',
'/usr/lib64/python2.7/lib-dynload',
'/usr/lib64/python2.7/site-packages',
'/usr/lib/python2.7/site-packages'
```

```
usr
main.py
from flask import Flask, request
app = Flask(__name__)
@app.route('/')
def hello():
    return 'Hello, World'
```

```
python2.7
└── site-packages
    └── Flask-1.1.1.dist-info
python3.6
└── site-packages
```

Requirements

- ▶ pip install flask
- ▶ pip install jinja2
- ▶ pip install markupsafe
- ▶ pip install Werkzeug
- ▶ pip install requests
- ▶ pip install gunicorn
- ▶ pip install flask jinja2 markupsafe

Requirements

```
► pip install flask
```

```
► pip install jinja2
```

```
► pip install markupsafe
```

```
► pip install Werkzeug
```

```
► pip install requests
```

```
► pip install gunicorn
```

```
► pip install flask jinja2 markupsafe
```

requirements.txt

Flask

Jinja2

MarkupSafe

Werkzeug

requests

gunicorn

Requirements

```
► pip install flask
```

requirements.txt

Flask

```
► pip install jinja2
```

Jinja2

```
► pip install markupsafe
```

MarkupSafe

```
► pip install Werkzeug
```

Werkzeug

```
► pip install requests
```

requests

```
► pip install gunicorn
```

gunicorn

```
► pip install flask jinja2 markupsafe
```

```
► pip install -r requirements.txt
```

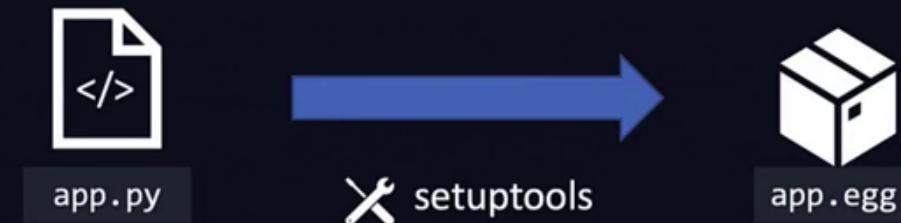
Upgrade/Uninstall Package

```
► pip install flask --upgrade
Installing collected packages: click, flask
Attempting uninstall: flask
  Found existing installation: Flask 0.10.1
  Uninstalling Flask-0.10.1:
    Successfully uninstalled Flask-0.10.1
Successfully installed click-7.1.1 flask-1.1.1
```

```
► pip uninstall flask
Found existing installation: Flask 1.1.1
Uninstalling Flask-1.1.1:
Would remove:
  /home/vagrant/.local/bin/flask
  /home/vagrant/.local/lib/python3.5/site-
packages/Flask-1.1.1.dist-info/*
  /home/vagrant/.local/lib/python3.5/site-
packages/flask/*
Proceed (y/n)? y
Successfully uninstalled Flask-1.1.1
```

Other Package Managers

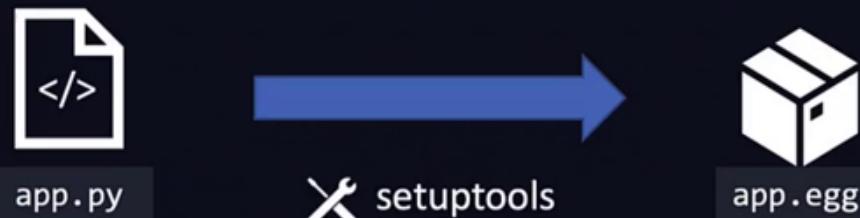
- easy_install



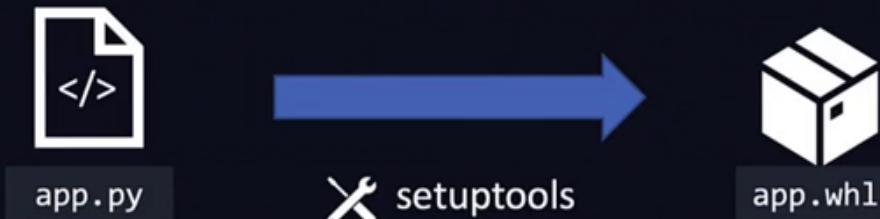
Other Package Managers

- easy_install

► easy_install install app



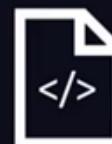
- wheels



Other Package Managers

- easy_install

► easy_install install app



app.py



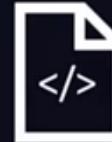
✗ setuptools



app.egg

- wheels

► pip install app.whl



app.py



✗ setuptools



app.whl

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```
Editor Tab 1 +  
controlplane $  
controlplane $  
controlplane $  
controlplane $  
controlplane $  
controlplane $ python3  
Python 3.8.10 (default, Nov 22 2023, 10:22:35)  
[GCC 9.4.0] on linux  
Type "help", "copyright", "credits" or "license" for more information.  
>>>  
controlplane $  
controlplane $  
controlplane $ python2  
Python 2.7.18 (default, Jul 1 2022, 12:27:04)  
[GCC 9.4.0] on linux2  
Type "help", "copyright", "credits" or "license" for more information.  
>>>  
controlplane $  
controlplane $ python2 -V  
Python 2.7.18  
controlplane $ python3 -V  
Python 3.8.10  
controlplane $  
controlplane $
```

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```
controlplane $  
controlplane $ pip -V  
pip 20.0.2 from /usr/lib/python3/dist-packages/pip (python 3.8)  
controlplane $  
controlplane $  
controlplane $  
controlplane $ pip3 -V  
pip 20.0.2 from /usr/lib/python3/dist-packages/pip (python 3.8)  
controlplane $  
controlplane $
```

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```
Editor Tab 1 +
controlplane $ 
controlplane $ 
controlplane $ 
controlplane $ mkdir pythonLABS
controlplane $ cd pythonLABS/
controlplane $ 
controlplane $ 
controlplane $ cat > hello.py
def print_hello_world():
    print("Hello, World!")
    return "Printed Hello, World!"

# Call the function
result = print_hello_world()

# Print the result returned by the function
print(result)
^C
controlplane $ python3 hello.py
Hello, World!
Printed Hello, World!
controlplane $ 
controlplane $ 
controlplane $ 
```

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Playground | Killer Shell CKA | K

killercoda.com/killer-shell-cka/scenario/playground

Play with Kubernetes ASCII Generator Play with Docker (4) CNCF [Cloud Na... Home | Microsoft 365 bmuschko (Benjami... sandervanvugt Trello fe All Bookmarks

K L L K C O D A Twitter LinkedIn PLUS Areas Account Creator Logout 35 min

```
Editor Tab 1 +  
controlplane $  
controlplane $  
controlplane $  
controlplane $  
controlplane $ ls  
hello.py  
controlplane $ #pip3 install flask  
controlplane $ ls  
hello.py  
controlplane $ pip3 show flask  
Name: flask  
Version: 3.0.0  
Summary: A simple framework for building complex web applications.  
Home-page: None  
Author: None  
Author-email: None  
License: None  
Location: /usr/local/lib/python3.8/dist-packages  
Requires: blinker, Werkzeug, click, Jinja2, importlib-metadata, itsdangerous  
Required-by:  
controlplane $  
controlplane $  
controlplane $  
controlplane $
```

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