🇬🇧

Gradle - 8.4

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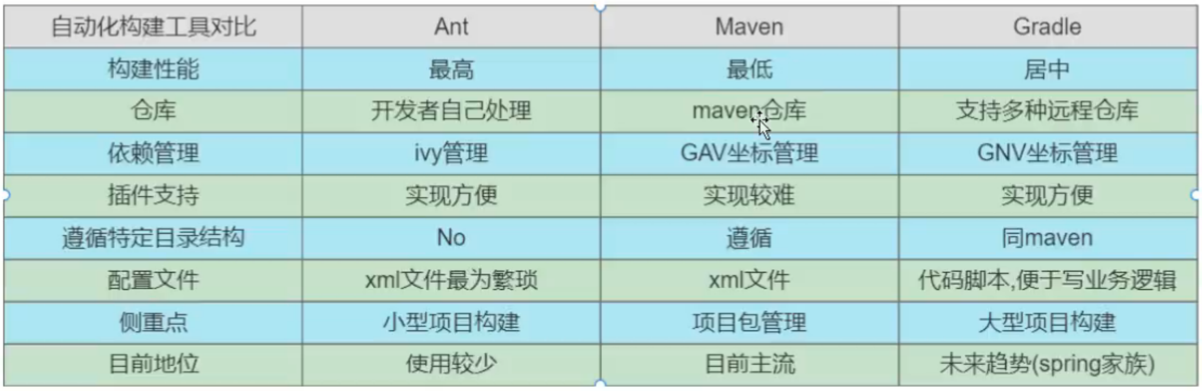
可能遇见的问题：

1. Gradel版本与 SpringBooot等不兼容
2. Gradel版本与idea版本不兼容

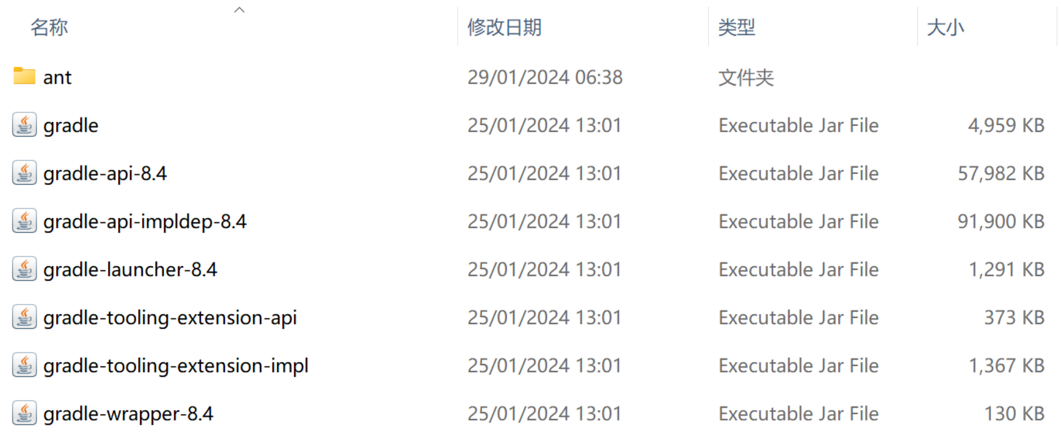
构建工具	优点	缺点
Ant	使用灵活, 速度快于Maven, gradle	没有强加任何编码约定的项目目录结构, 开发人员需要编写复杂XML文件构建指令, 对开发人员是一个挑战.
Maven	遵循一套约定大于配置的项目目录结构, 使用同意的GAV坐标进行依赖管理, 侧重于包管理.	项目构建过程僵化, 配置文件编写不够灵活, 不方便自定义组件, 构建速度慢于Gradle
Gradle	集Ant脚本的灵活性+Maven约定大于配置的项目目录优势, 支持多种远程仓库和插件, 侧重于大项目构建.	学习成本高, 资料少, 脚本灵活, 版本兼容性差.



自动化构建工具对比	Ant	Maven	Gradle
构建性能	最高	最低	居中
仓库	开发者自己处理	maven仓库	支持多种远程仓库
依赖管理	ivy管理	GAV坐标管理	GNV坐标管理
插件支持	实现方便	实现较难	实现方便
遵循特定目录结构	No	遵循	同maven
配置文件	xml文件最为繁琐	xml文件	代码脚本,便于写业务逻辑
侧重点	小型项目构建	项目包管理	大型项目构建
目前地位	使用较少	目前主流	未来趋势(spring家族)

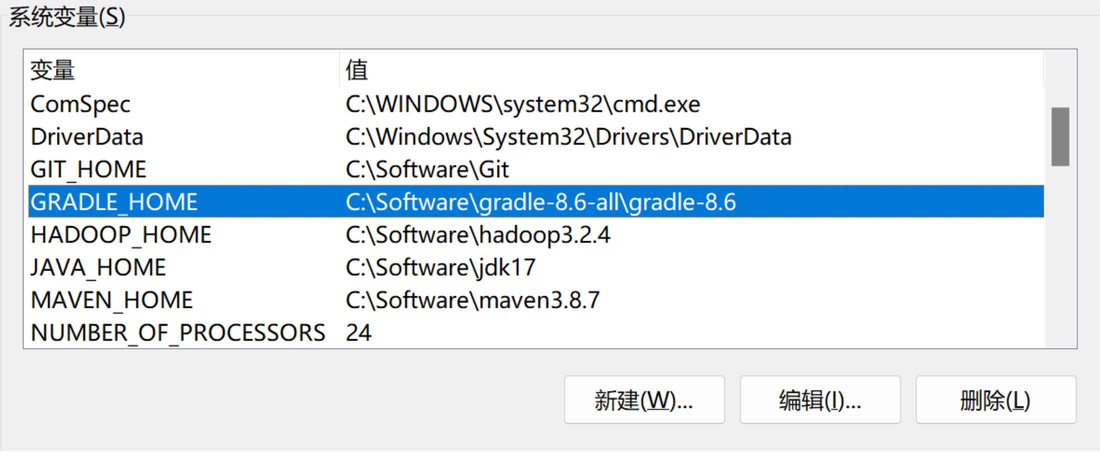
▼ 1. Install Gradle

First go to the C:\Program Files\JetBrains\IntelliJ IDEA 2023.3.3\plugins\gradle\lib directory to confirm the gradle version compatible with the current Idea. At least version 8.4 of gradle must be installed here.



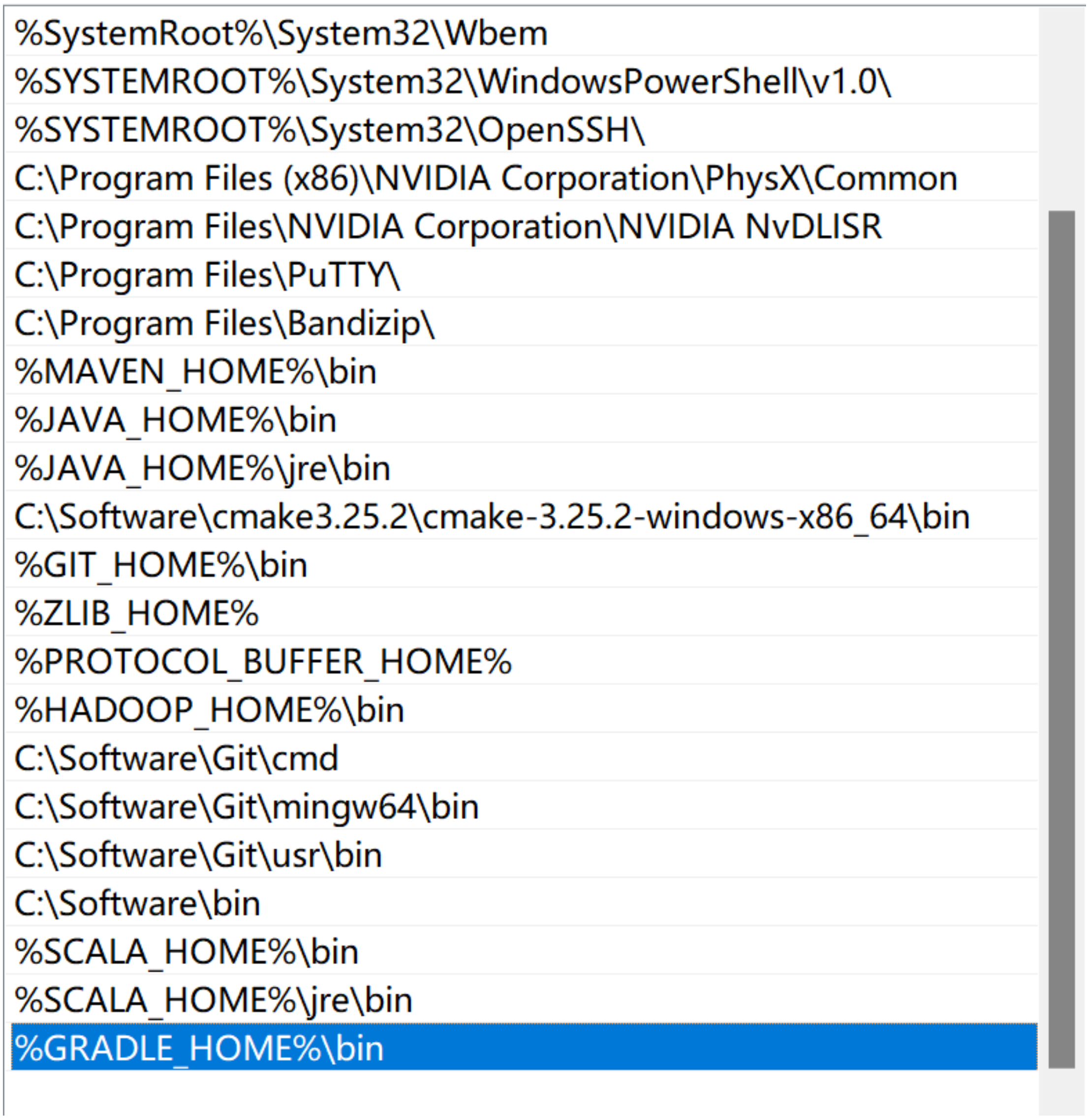
名称	修改日期	类型	大小
ant	29/01/2024 06:38	文件夹	
gradle	25/01/2024 13:01	Executable Jar File	4,959 KB
gradle-api-8.4	25/01/2024 13:01	Executable Jar File	57,982 KB
gradle-api-impldep-8.4	25/01/2024 13:01	Executable Jar File	91,900 KB
gradle-launcher-8.4	25/01/2024 13:01	Executable Jar File	1,291 KB
gradle-tooling-extension-api	25/01/2024 13:01	Executable Jar File	373 KB
gradle-tooling-extension-impl	25/01/2024 13:01	Executable Jar File	1,367 KB
gradle-wrapper-8.4	25/01/2024 13:01	Executable Jar File	130 KB

1. **URL:** https://gradle.org/releases/ →Select the corresponding binary version to download. The bin directory of the complete version may not have a startup command.
2. Configure environment variables My Computer → Properties → Advanced System Settings → Environment Variables



系统变量(S)

变量	值
ComSpec	C:\WINDOWS\system32\cmd.exe
DriverData	C:\Windows\System32\Drivers\DriverData
GIT_HOME	C:\Software\Git
GRADLE_HOME	C:\Software\gradle-8.6-all\gradle-8.6
HADOOP_HOME	C:\Software\hadoop3.2.4
JAVA_HOME	C:\Software\jdk17
MAVEN_HOME	C:\Software\maven3.8.7
NUMBER_OF_PROCESSORS	24



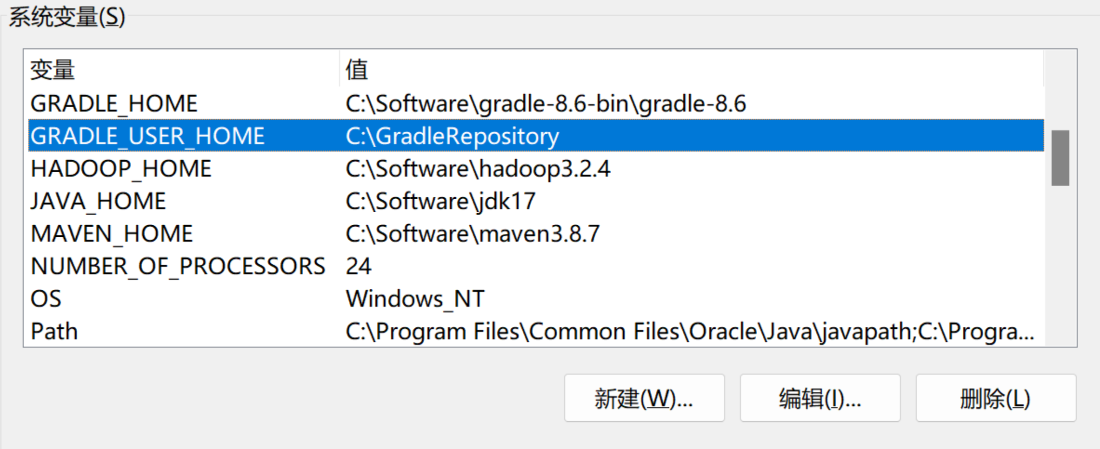
```
%SystemRoot%\System32\Wbem
%SYSTEMROOT%\System32\WindowsPowerShell\v1.0\
%SYSTEMROOT%\System32\OpenSSH\
C:\Program Files (x86)\NVIDIA Corporation\PhysX\Common
C:\Program Files\NVIDIA Corporation\NVIDIA NvDLISR
C:\Program Files\PuTTY\
C:\Program Files\Bandizip\
%MAVEN_HOME%\bin
%JAVA_HOME%\bin
%JAVA_HOME%\jre\bin
C:\Software\cmake3.25.2\cmake-3.25.2-windows-x86_64\bin
%GIT_HOME%\bin
%ZLIB_HOME%
%PROTOCOL_BUFFER_HOME%
%HADOOP_HOME%\bin
C:\Software\Git\cmd
C:\Software\Git\mingw64\bin
C:\Software\Git\usr\bin
C:\Software\bin
%SCALA_HOME%\bin
%SCALA_HOME%\jre\bin
%GRADLE_HOME%\bin
```

3.

```
C:\Users\ArtistS>gradle -v
```

```
Welcome to Gradle 8.6!

Here are the highlights of this release:
 - Configurable encryption key for configuration cache
 - Build init improvements
 - Build authoring improvements

For more details see https://docs.gradle.org/8.6/release-no


-----------------------------------------------------------
Gradle 8.6
-----------------------------------------------------------

Build time:    2024-02-02 16:47:16 UTC
Revision:      d55c486870a0dc6f6278f53d21381396d0741c6e

Kotlin:        1.9.20
Groovy:        3.0.17
Ant:           Apache Ant(TM) version 1.10.13 compiled on Ja
JVM:           17.0.10 (Oracle Corporation 17.0.10+11-LTS-24
OS:            Windows 11 10.0 amd64
```

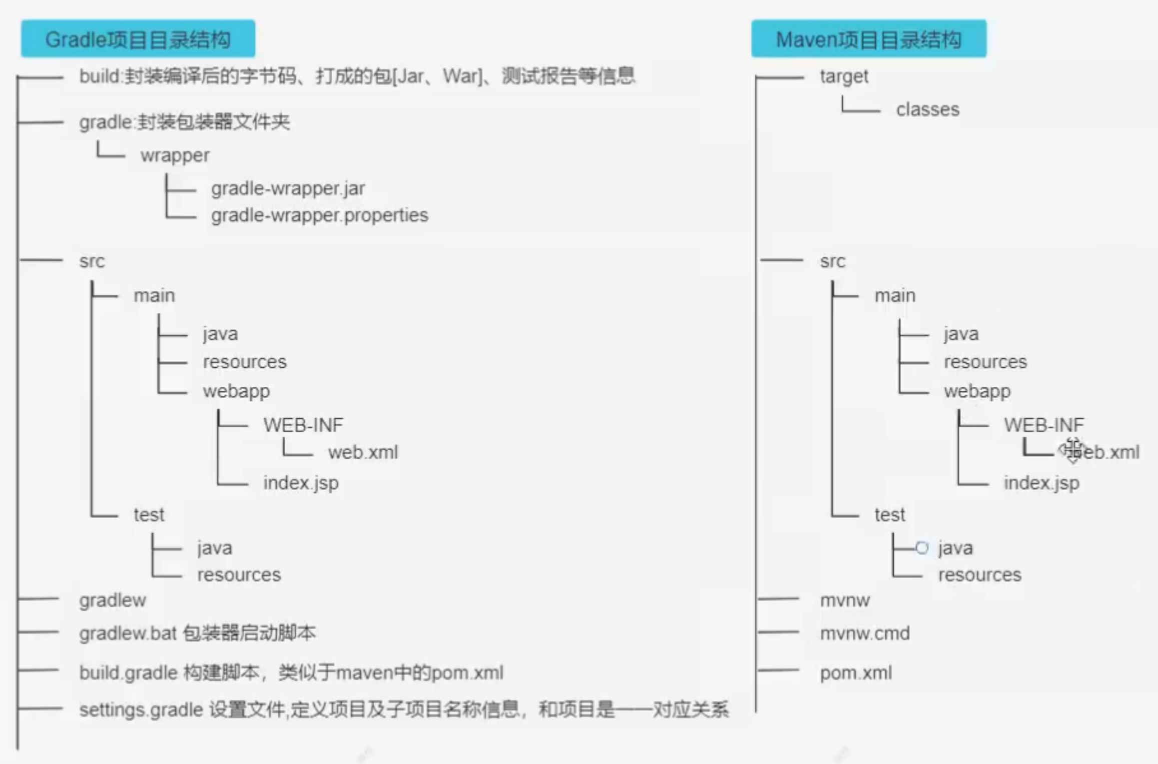
4. Configure the gradle local warehouse, My Computer → Properties → Advanced System Settings → Environment Variables, add the following configuration



变量	值
GRADLE_HOME	C:\Software\gradle-8.6-bin\gradle-8.6
GRADLE_USER_HOME	C:\GradleRepository
HADOOP_HOME	C:\Software\hadoop3.2.4
JAVA_HOME	C:\Software\jdk17
MAVEN_HOME	C:\Software\maven3.8.7
NUMBER_OF_PROCESSORS	24
OS	Windows_NT
Path	C:\Program Files\Common Files\Oracle\Java\javapath;C:\Progra...

▼ 2. Gradle project directory structure

The default directory structure of the Gradle project is consistent with that of the Maven project, both based on Convention Over Configuration. The complete project directory structure is as follows:



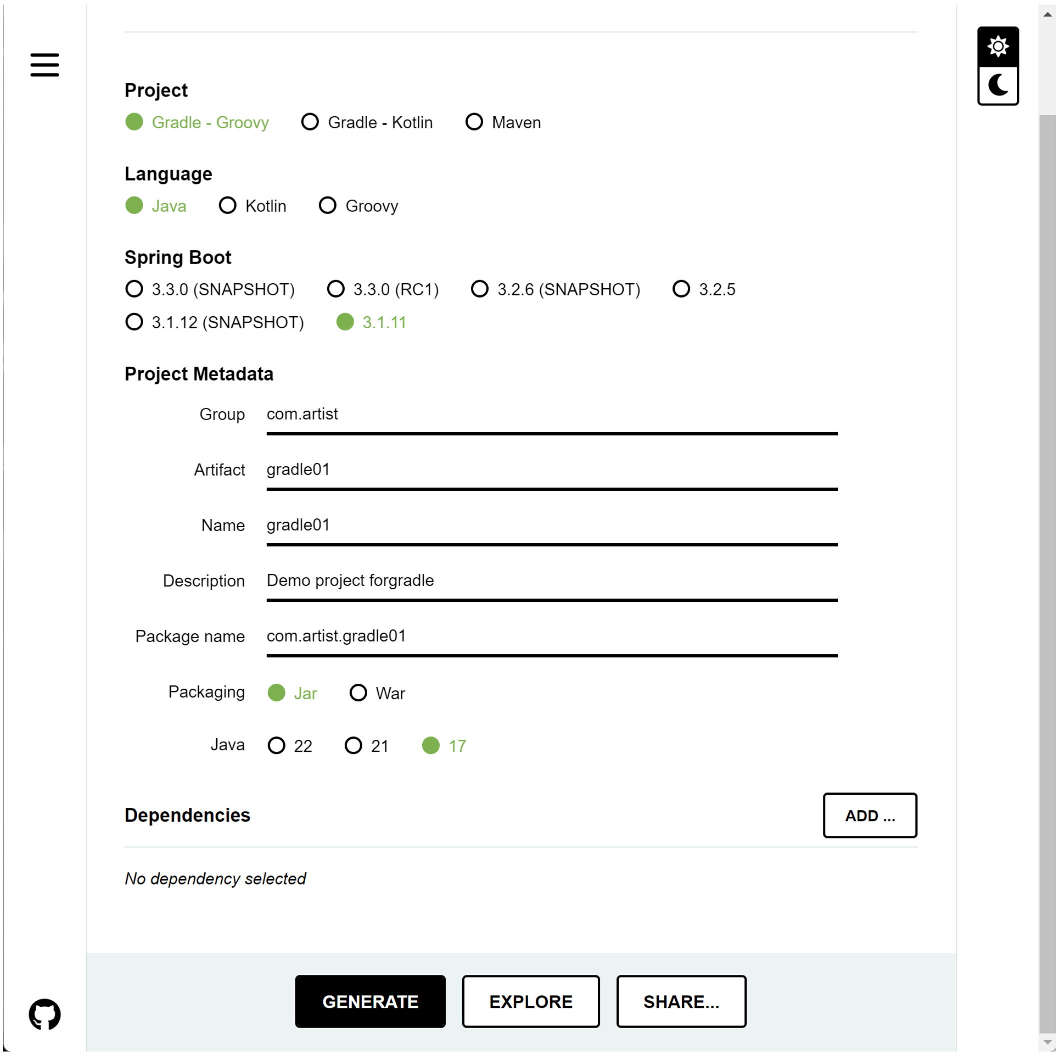
Gradle Directory	Maven Directory
build → Encapsulates compiled bytecode, packaged [Jar, War], test report and other information	target → The compiled classes files will be stored inside.
src → To put source code	src → To put source code
settings.gradle → Settings file, defines project and sub-project name information, and has a one-to-one correspondence with the project	
build.gradle → Build script, each Project (can be understood as a maven module) has a build.gradle	pom.xml → Build script, store dependencies

Tip: gradlew.bat and gradlew execute the gradle instructions in the wrapper version specified in gradle, not the locally installed gradle instructions. So if you only compile locally, there is no need for these three folders to exist.

▼ 3. Create Gradle Project

3.1 Use spring initializr to create project

1. Open https://start.spring.io/
2. Fill in the project details



Project

● Gradle - Groovy ○ Gradle - Kotlin ○ Maven

Language

● Java ○ Kotlin ○ Groovy

Spring Boot

○ 3.3.0 (SNAPSHOT) ○ 3.3.0 (RC1) ○ 3.2.6 (SNAPSHOT) ○ 3.2.5
○ 3.1.12 (SNAPSHOT) ● 3.1.11

Project Metadata

Group	com.artist
Artifact	gradle01
Name	gradle01
Description	Demo project forgradle
Package name	com.artist.gradle01
Packaging	● Jar ○ War
Java	○ 22 ○ 21 ● 17

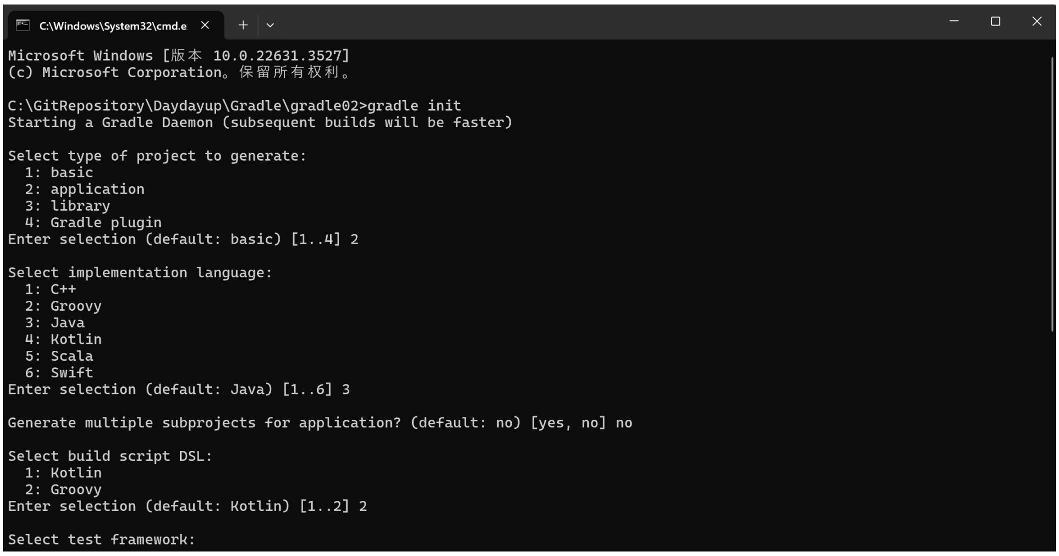
Dependencies

No dependency selected

3. Drag the automatically downloaded file to the Git repository and decompress it.

3.2 Use Gradle Command to create project

1. Create a folder named gradle02 , input command `gradle init` by cmd



```
Microsoft Windows [版本 10.0.22631.3527]
(c) Microsoft Corporation。保留所有权利。

C:\GitRepository\Daydayup\Gradle\gradle02>gradle init
Starting a Gradle Daemon (subsequent builds will be faster)

Select type of project to generate:
  1: basic
  2: application
  3: library
  4: Gradle plugin
Enter selection (default: basic) [1..4] 2

Select implementation language:
  1: C++
  2: Groovy
  3: Java
  4: Kotlin
  5: Scala
  6: Swift
Enter selection (default: Java) [1..6] 3

Generate multiple subprojects for application? (default: no) [yes, no] no

Select build script DSL:
  1: Kotlin
  2: Groovy
Enter selection (default: Kotlin) [1..2] 2

Select test framework:
```

2. Select as needed to complete creation.

4. Gradle Command

gradle command must execute under a directory with build.gradle

Command	Description
`gradle build`	Build
`gradle build -x test`	Build without test
`gradle classes`	Compile business code and configuration file
`gradle clean`	Clear the build directory
`gradle test`	Compile test code and generate test report

5. init.d Folder

5.1 init.d folder

> We can create **xxx.gradle** file in **C:\Software\gradle-8.6-bin\gradle-8.6\init.d**, xxx.gradle file can be executed before build, so you can config some preload operations.

5.2 Create init.gradle in init.d

```
// all projects will use the following configuration
allprojects{
```

```
/*
    Dependencies require for the project will download from
    the following repositories
*/
    repositories{
    /*
        It will try to find the dependencies in maven local
        repository, this need M2_HOME environment variable
    */
        mavenLocal()
        // Third-party repository
        maven { name "Alibaba" ; url"https://maven.aliyun.c
        // Third-party repository
        maven { name "Bstek" ; url"https://nexus.bsdn.org/c
    }

    /*
        Use for build.gradle build script(e.g. plugins), if
        need some dependencies, it will download from the
        following repositories.
    */
    buildscript{
        maven { name "Alibaba" ; url"https://maven.aliyun.c
        maven { name "Bstek" ; url"https://nexus.bsdn.org/c
        maven { name "M2" ; url'https://plugins.gradle.org/
    }
}
```

5.3 How to enable init.gradle?

> **If there are more than 2 of the following methods, gradle will follow the order to execute them. If there are more than 2 init script under same folder, gradle will execute them in the order of a-z. Each init script will has a gradle instance, the methods and properties you called in the init script, will delegate to this gradle instance.**

1. Use command line

   ```
   # You can enter this command multiple times to specify m
   gradle --init-script [DIR_PATH]/init.gradle -q [TASK_NAM
   ```

2. Put **init.gradle** file into **[USER_HOME]/.gradle/**

   e.g. C:\Users\ArtistS\.gradle

3. Put **xxx.gradle** into **[USER_HOME]/.gradle/init.d/**
4. Put **xxx.gradle** into **[GRADLE_HOME]/init.d/**

   e.g. C:\Software\gradle-8.6-bin\gradle-8.6\init.d

5.4 Repository instructions

mavenLocal() → Gradle will find the repository by the repository path in maven settings.xml. The order in which gradle searches for jar packages is as follows:

[USER_HOME]/.m2/settings.xml → **[M2_HOME]/conf/settings.xml** → **[USER_HOME]/.m2/repository**

maven{[URL address]} → e.g. private repository, alibaba repository

mavenCentral() → Maven central repository, no need to config, you can use it by directly declaring it

> Gradle can avoid downloading from the remote repository every time by combining the specified repository and remote repository. But here is a problem, if the local maven repository has this dependency, gradle will load it directly. But if the local maven doesn't have this dependency, Gradle will download it from a remote repository. Keep in mind, that this jar download from the remote repository will not be stored in the maven

> repository, it will be put into the cache directory, the default path is **[USER_HOME]/.gradle/cashes**. If you didn't configure the **GRADLE_USER_HOME** environment variable. It will be put into **[GRADLE_USER_HOME]/cashes**. There is no other way to put the downloaded jar into Maven repository, because the format of the jar downloaded in cashes folder is different from the jar stored in the maven repository.

Repository URL: https://developer.aliyun.com/mvn/guide

6. Gradle Wrapper

Gradle Wrapper is a layer of packaging for gradle, it used to solve the problem different projects need different Gradle version. In fact, after having gradle wrapper, we don't need to configure the Gradle anymore, we can use the gradle project's wrapper to operate it.

E.g. I want to share my code to you, there will be 2 scenarios happen

1. There is no Gradle on your computer.
2. Your computer has Gradle, but the version too old.

6.1 How to use Gradle wrapper?

`gradelw`, `gradlew.cmd` uses the version specified by gradle wrapper. Because, we will use local Gradle in most cases, so the local Gradle command may be different from Gradle Wrapper command.

```
# You can compare the result of these 2 command in your pro
gradle -v
gradlew -v
gradlew.bat -v
```

But the usage of `gradle` and `gradlew` is the same.

6.2 How to change gradle wrapper version?

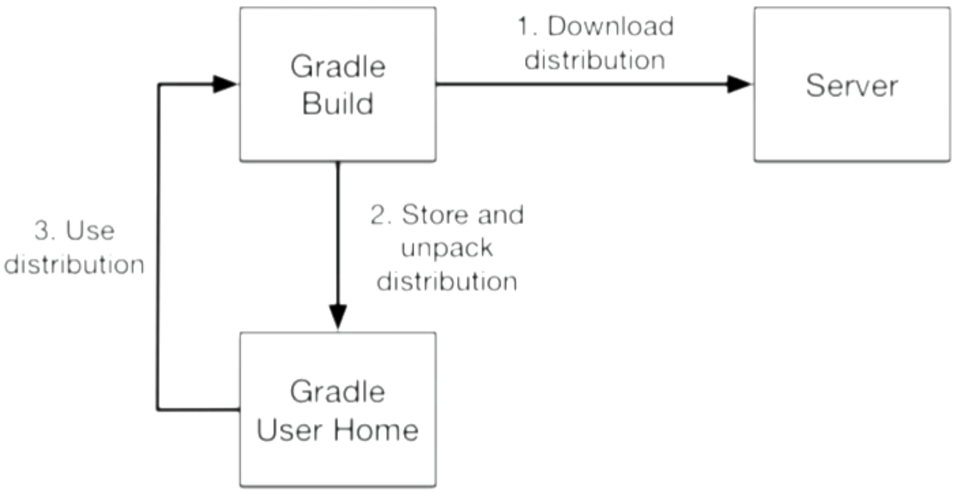
We can use some parameters to control the generation of Wrapper.

```
# You can check the gradle wrapper version in gradle-wrappe

# You can use this way to upgrade the gradle wrapper (only
# gradle-wrapper.properties but it doesn't download yet.)
gradle wrapper --gradle-version=[version number]
gradle wrapper --gradle-verison=7.4.2
```

The above operation can only change the version in gradle-wrapper.properties. When gradle download the new version?

Gradle Wrapper Implementation Process:

1. When we first execute `./gradlew build` , `gradlew` will read **gradle-wrapper.properties**
2. Gradle will download the specific version and put it into **[GRADLE_HOME]/wrapper/dists**
3. Build local cash, put it into **[GRADLE_HOME]/cashes.** If the version you want to download already in this folder, you don't need to download it anymore.
4. After that, all `./gradlew` will use this specific Gradle version.



6.3 gradle-wrapper.properties

Field	Description
distributionBase	The storage directory after decompression of the gradle compression package
distributionPath	The path of gradle compression package, after decompression of the gradle compression package.
zipStoreBase	Same as distributionBase, but this is for zip package.
zipStiorePath	Same as distributionPath, but this is for zip package.
distributionUrl	Download address of gradle distribution compressed package

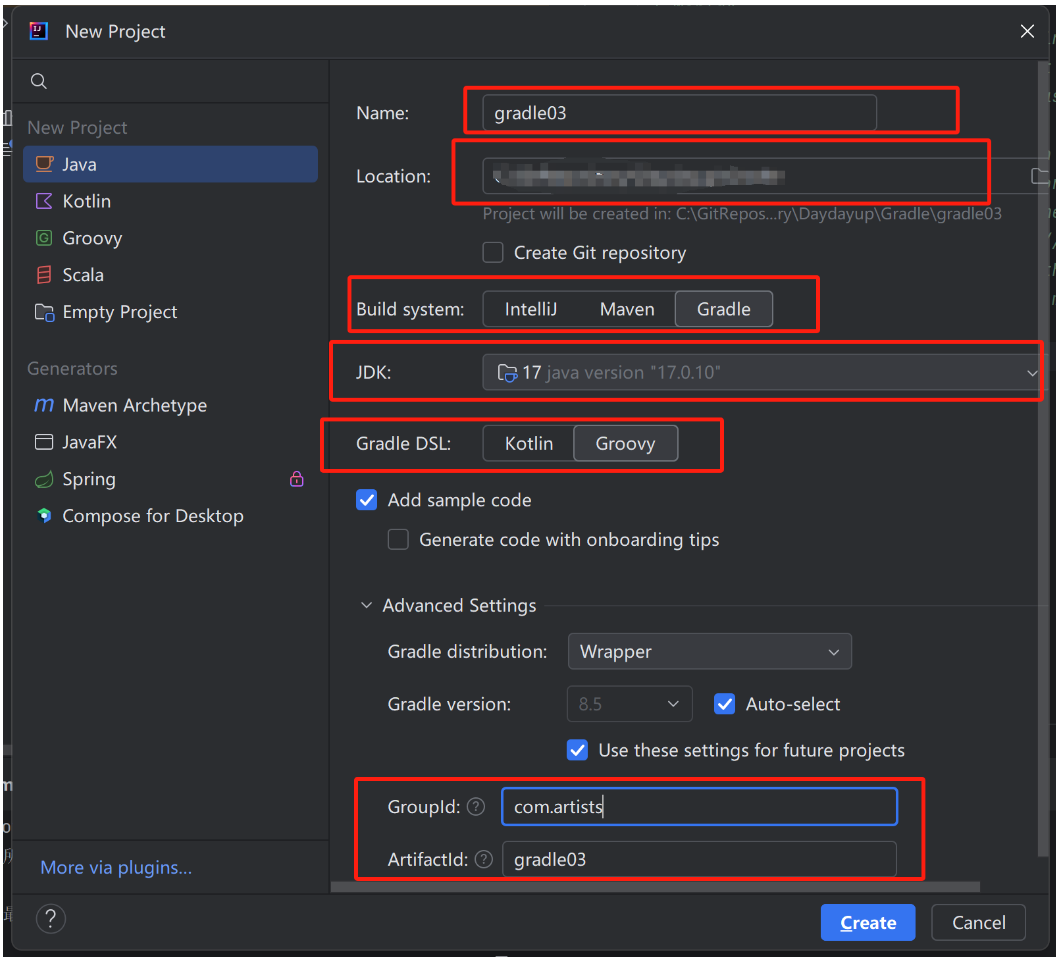
6.4 When we use gradle, when we use gradlew

If the project you wrote before or this project you copy or share from someone, you should use gradlew. But if you create a new project with Gradle, you should use `gradle` rather than `gradlew`.

▼ 7. Create & Deploy Project in IDEA

▼ 7.1 Create general JAVA project with Gradle by IDEA

1. New Project → Update details as the following screenshot



Name: gradle03

Location: [redacted]

Project will be created in: C:\GitRepos...ry\Daydayup\Gradle\gradle03

□ Create Git repository

Build system: IntelliJ Maven [✓ Gradle]

JDK: 17 java version "17.0.10"

Gradle DSL: Kotlin [✓ Groovy]

☑ Add sample code

□ Generate code with onboarding tips

Advanced Settings

Gradle distribution: Wrapper

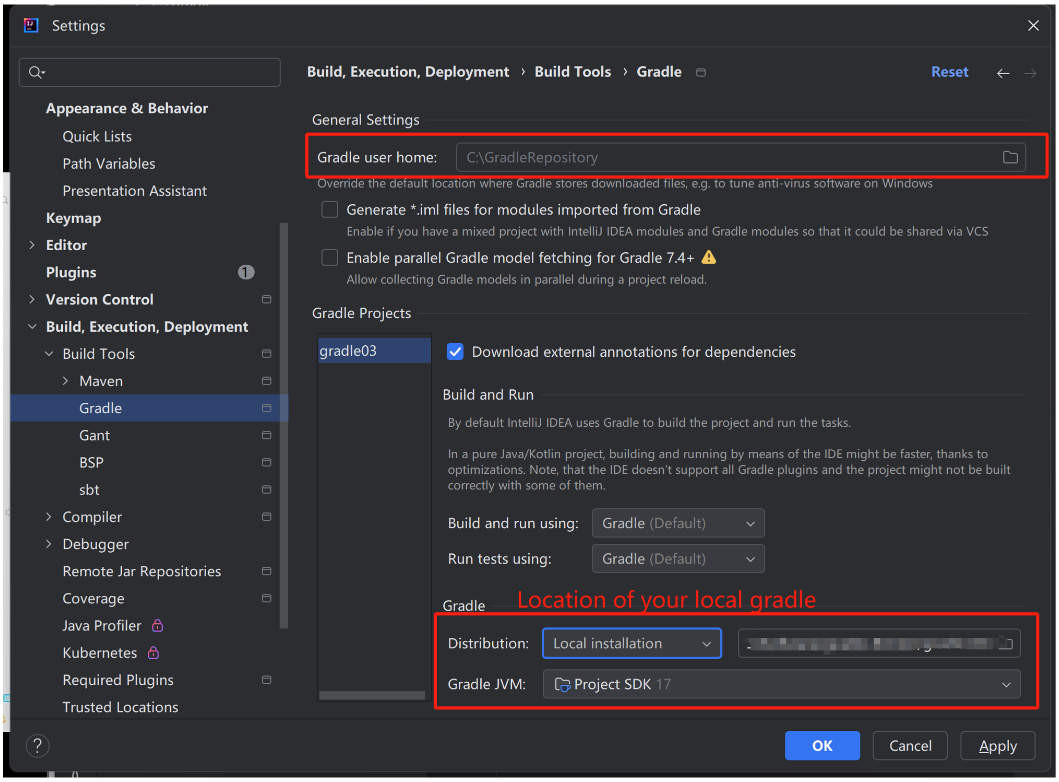
Gradle version: 8.5 ☑ Auto-select

☑ Use these settings for future projects

GroupId: com.artists

ArtifactId: gradle03

2. After create project, the project will use IDEA gradle version, not your local gradle version. If you want to change gradle to your local gradle, File → Settings → `Build,Execution,Deployment → Build Tools → Gradle`



Settings

Build, Execution, Deployment › Build Tools › Gradle

General Settings

Gradle user home: C:\GradleRepository

Override the default location where Gradle stores downloaded files, e.g. to tune anti-virus software on Windows

□ Generate *.iml files for modules imported from Gradle

Enable if you have a mixed project with IntelliJ IDEA modules and Gradle modules so that it could be shared via VCS

□ Enable parallel Gradle model fetching for Gradle 7.4+

Allow collecting Gradle models in parallel during a project reload.

Gradle Projects

gradle03

☑ Download external annotations for dependencies

Build and Run

By default IntelliJ IDEA uses Gradle to build the project and run the tasks.

In a pure Java/Kotlin project, building and running by means of the IDE might be faster, thanks to optimizations. Note, that the IDE doesn't support all Gradle plugins and the project might not be built correctly with some of them.

Build and run using: Gradle (Default)

Run tests using: Gradle (Default)

Gradle

Location of your local gradle

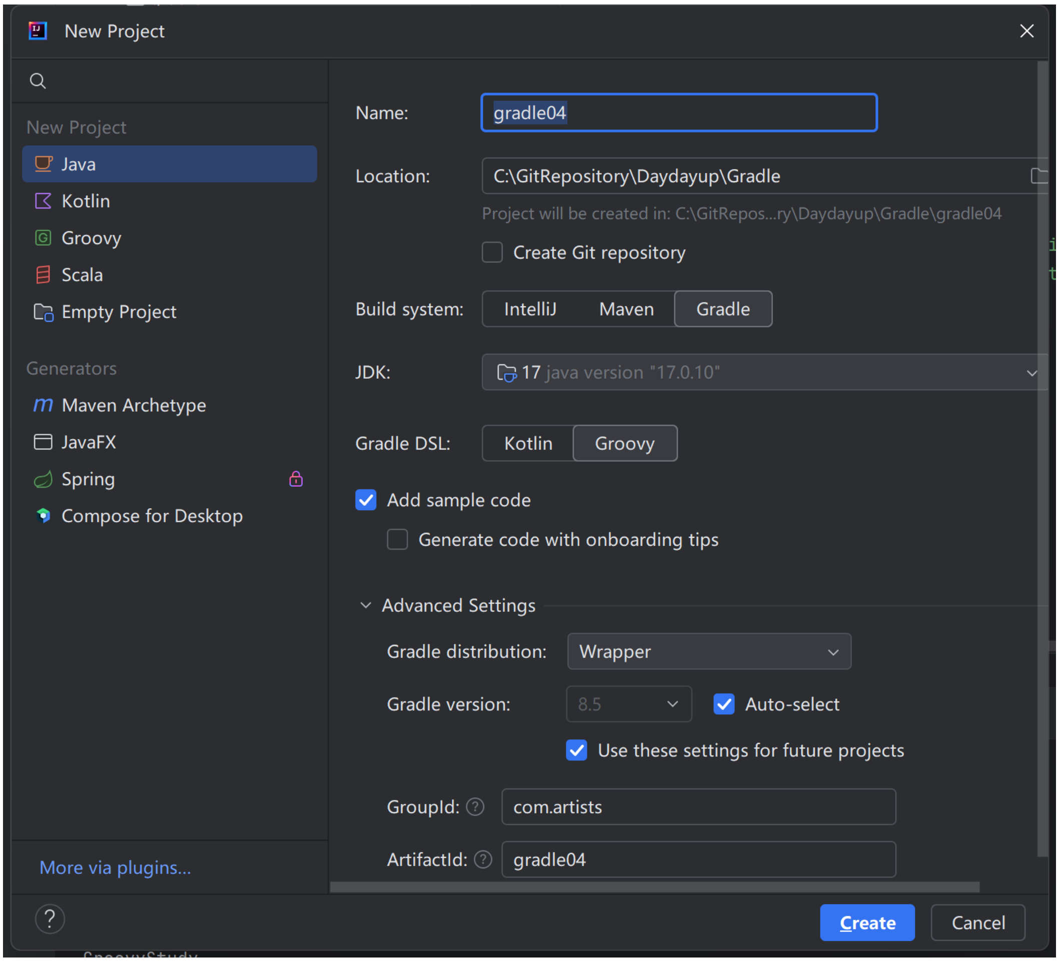
Distribution: Local installation [redacted]

Gradle JVM: Project SDK 17

> Tip:
> 1. You can only use this way to change Gradle to your local Gradle when you create a new project.
> 2. When you add dependencies on **gradle.build**, these dependencies will download to **[GRADLE_USER_HOME]/cashes/module-2/files-2.1**

▼ 7.2 Create SSM project with Gradle by IDEA

1. Same step with 7.1



New Project

Name: gradle04

Location: C:\GitRepository\Daydayup\Gradle

Project will be created in: C:\GitRepos...ry\Daydayup\Gradle\gradle04

☐ Create Git repository

Build system: IntelliJ | Maven | **Gradle**

JDK: 17 java version "17.0.10"

Gradle DSL: Kotlin | **Groovy**

☑ Add sample code

☐ Generate code with onboarding tips

Advanced Settings

Gradle distribution: Wrapper

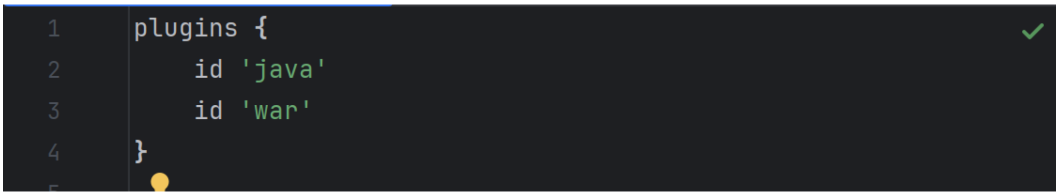
Gradle version: 8.5 ☑ Auto-select

☑ Use these settings for future projects

GroupId: com.artists

ArtifactId: gradle04

2. Open **build.gradle** and then add war plugin

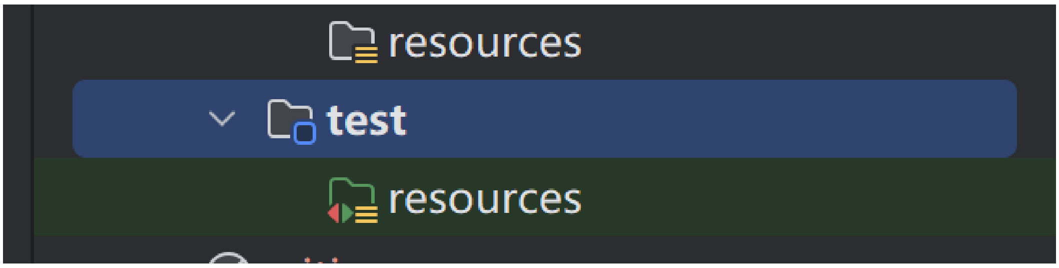


```
plugins {
    id 'java'
    id 'war'
}
```

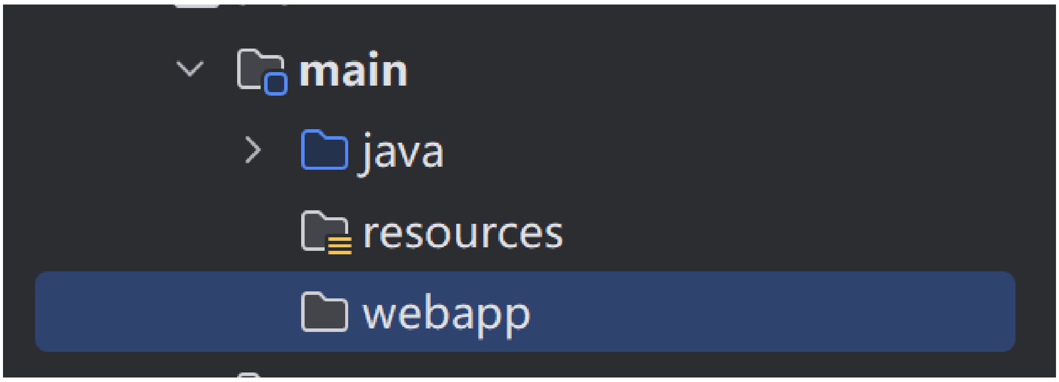
3. Add related dependencies into **build.gradle**

```
dependencies {
    // Spring dependencies
    implementation 'org.springframework:spring-beans:
    implementation 'org.springframework:spring-web:4.
    implementation 'org.springframework:spring-webmvc
    implementation 'org.springframework:spring-tx:4.1
    implementation 'org.springframework:spring-test:4
    implementation 'org.springframework:spring-jdbc:4
    // Mybatis
    implementation 'org.mybatis:mybatis-spring:1.2.3'
    implementation 'org.mybatis:mybatis:3.3.0'

    // Mysql
    implementation 'mysql:mysql-connector-java:5.1.36
    implementation 'com.alibaba:druid:1.0.15'

    // jackson
    implementation 'com.fasterxml.jackson.core:jackso
    implementation 'com.fasterxml.jackson.core:jackso
    implementation 'com.fasterxml.jackson.core:jackso

    // Others
    implementation 'org.aspectj:aspectjweaver:1.8.6'
    implementation 'log4j:log4j:1.2.17'
    implementation 'org.slf4j:slf4j-api:1.7.25'
    implementation 'jstl:jstl:1.2'
    compileOnly 'javax.servlet:servlet-api:2.5'
    testImplementation group: 'junit', name: 'junit',
}
```

4. Delete default test folder named java



5. Due to this is a web project, we need to create a **webapp** folder under **main** folder



6. Create **WEB-INF** folder and add **web.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
<web-app xmlns:xsi="http://www.w3.org/2001/XMLSchema-
         xmlns="http://java.sun.com/xml/ns/javaee"
         xsi:schemaLocation="http://java.sun.com/xml/
         version="2.5">

    <context-param>
        <!--Path and file name of spring configuratio
        <param-name>contextConfigLocation</param-name
        <param-value>classpath:applicationContext.xml
    </context-param>

    <!--Spring listener-->
    <listener>
        <listener-class>org.springframework.web.conte
    </listener>

    <!--Config front-end controller-->
    <servlet>
        <servlet-name>DispatcherServlet</servlet-name
        <servlet-class>org.springframework.web.servle
        <init-param>
            <param-name>contextConfigLocation</param-
            <param-value>classpath:spring-mvc.xml</pa
        </init-param>
    </servlet>

    <servlet-mapping>
```

```
        <servlet-name>DispatcherServlet</servlet-name
        <url-pattern>/</url-pattern>
    </servlet-mapping>

    <!-- post garbled characters -->
    <filter>
        <filter-name>CharacterEncodingFilter</filter-
        <filter-class>org.springframework.web.filter.
        <init-param>
            <param-name>encoding</param-name>
            <param-value>utf-8</param-value>
        </init-param>

        <init-param>
            <param-name>forceEncoding</param-name>
            <param-value>true</param-value>
        </init-param>
    </filter>

    <filter-mapping>
        <filter-name>CharacterEncodingFilter</filter-
        <url-pattern>/*</url-pattern>
    </filter-mapping>

    <!--Config convert POST request to PUT or DELETE
    <filter>
        <filter-name>HiddenHttpMethodFilter</filter-n
        <filter-class>org.springframework.web.filter.
    </filter>
    <filter-mapping>
        <filter-name>HiddenHttpMethodFilter</filter-n
        <url-pattern>/*</url-pattern>
    </filter-mapping>
</web-app>
```

7. Create **springmvc.xml** under **resources** folder

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/b
       xmlns:xsi="http://www.w3.org/2001/XMLSchema-in
       xmlns:context="http://www.springframework.org/
       xmlns:mvc="http://www.springframework.org/sche
       xsi:schemaLocation="http://www.springframework

      <!-- 1.Scan packages -->
    <context:component-scan base-package="com.artists
         <context:include-filter type="annotation" ex
         <context:include-filter type="annotation" ex
    </context:component-scan>

     <!-- 2.Configure internal view resolver-->
    <bean class="org.springframework.web.servlet.view
        <property name="prefix" value="/WEB-INF/"/>
        <property name="suffix" value=".jsp"/>
    </bean>
    <!--3.Handle static resources -->
    <mvc:default-servlet-handler/>
    <mvc:annotation-driven/>
</beans>
```

8. Create package **com.artists**

9. Configure **mybatis-config.xml**

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE configuration
        PUBLIC "-//mybatis.org//DTD Config 3.0//EN"
        "http://mybatis.org/dtd/mybatis-3-config.dtd"
<configuration>
</configuration>
```

10. Configure **jdbc.properties**

```
jdbc.jdbcUrl=jdbc:mysql://localhost:3306/test?rewrite
jdbc.driverClass=com.mysql.jdbc.Driver
jdbc.userName=root
jdbc.password=123456
```

11. Configure **applicationContext.xml**

```
<?xml version="1.0" encoding="UTF-8"?>
<beans xmlns="http://www.springframework.org/schema/b
       xmlns:xsi="http://www.w3.org/2001/XMLSchema-in
       xmlns:context="http://www.springframework.org/
       xsi:schemaLocation="http://www.springframework


    <!-- 0.Scan packages -->
    <context:component-scan base-package="com.artists
        <context:exclude-filter type="annotation" exp
        <context:exclude-filter type="annotation" exp
    </context:component-scan>

    <!-- 1.Load properties file-->
    <context:property-placeholder location="classpath


    <!-- 2.Configura data source -->
    <bean id="dataSource" class="com.alibaba.druid.po
        <property name="username" value="${jdbc.userN
        <property name="password" value="${jdbc.passw
        <property name="url" value="${jdbc.jdbcUrl}">
        <property name="driverClassName" value="${jdb
    </bean>

    <!-- 4.Configura transaction -->
    <bean id="transactionManager" class="org.springfr
        <property name="dataSource" ref="dataSource">
    </bean>

    <tx:annotation-driven transaction-manager="transa
    <!-- 1.Configure spring to integrate mybatis -->
    <bean class="org.mybatis.spring.SqlSessionFactory
        <property name="dataSource" ref="dataSource">
        <property name="configLocation" value="classp
    </bean>

    <!-- 2.Configure bean objects for scanning mapper
    <bean class="org.mybatis.spring.mapper.MapperScan
        <property name="basePackage" value="com.artis
    </bean>

</beans>
```

11. Create related mapper file

```
<?xml version="1.0" encoding="UTF-8" ?>
<!DOCTYPE mapper PUBLIC "-//mybatis.org//DTD Mapper 3.
<mapper namespace="com.artists.dao.AdminMapper">

    <select id="getAdminList" resultType="com.artists.
        select id,username,email from admin
    </select>

</mapper>
```

7.3 Deploy project with Gretty (not friendly after gradle 6.x)

1. Import **Gretty** plugin

```
plugins {
    id 'java'
    id 'war'
    id 'org.gretty' version '2.2.0'
}
```

2. Configure Gretty

```
gretty{
    httpPort=8888
    httpsPort=4431
    contextPath="/web"
    debugPort=5005
    debugSuspend=true
    httpsEnabled=true
    managedClassReload=true
    //servletContainer='tomcats' //Default container
}
```

3. `gradle appRun`