

## EXPERIMENT-4

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### Practical Exercise: Build and Run a Java Application with Maven, Migrate the Same Application to Gradle.

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#### Step 1: Creating a Maven Project

You can create a **Maven project** using the **mvn** command (or through your **IDE**, as mentioned earlier). But here, I'll give you the essential **pom.xml** and **Java code**.

- **I'm Using Command Line:**
  - To create a basic Maven project using the command line, you can use the following command:

```
mvn archetype:generate -DgroupId=com.example  
-DartifactId=maven-example -  
DarchetypeArtifactId=maven-archetype-  
quickstart -DinteractiveMode=false
```

#### Step 2: Open The pom.xml File

- You can manually navigate the **project folder** named call **maven-example** and open the file **pom.xml** and copy the below code and paste it then save it.
- In case if you not getting project folder then type command in your cmd.
  - **cd maven-example** – is use to navigate the project folder.
  - **notepad pom.xml** – is use to open pom file in notepad.

```
<?xml version="1.0" encoding="UTF-8"?>

<project xmlns="http://maven.apache.org/POM/4.0.0"
    xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance"

xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
http://maven.apache.org/xsd/maven-4.0.0.xsd">

    <modelVersion>4.0.0</modelVersion>

    <groupId>com.example</groupId>

    <artifactId>maven-example</artifactId>

    <version>1.0-SNAPSHOT</version>


    <dependencies>

        <dependency>

            <groupId>junit</groupId>

            <artifactId>junit</artifactId>

            <version>4.12</version>

            <scope>test</scope>

        </dependency>

    </dependencies>
```

```
<build>
  <plugins>
    <plugin>
      <groupId>org.apache.maven.plugins</groupId>
      <artifactId>maven-compiler-plugin</artifactId>
      <version>3.8.1</version>
      <configuration>
        <source>1.8</source>
        <target>1.8</target>
      </configuration>
    </plugin>
  </plugins>
</build>
</project>
```

### Step 3: Open Java Code (App.java) File

- Open a file **App.java** inside the **src/main/java/com/example/** directory.
- After opening the **App.java** copy the below code and paste it in that file then save it.

```
package com.example;

public class App {

    public static void main(String[] args) {

        System.out.println("Hello, Maven");

        System.out.println("This is the simple realworld
example....");

        int a = 5;

        int b = 10;

        System.out.println("Sum of " + a + " and " + b + " is "
+ sum(a, b));

    }

    public static int sum(int x, int y) {

        return x + y;

    }

}
```

```
}
```

## Step 4: Run the Project

To build and run this project, follow these steps:

- Open the terminal in the project directory and run the following command to build the project.
- 

```
mvn clean install
```

- Run the program with below command:

```
mvn exec:java -Dexec.mainClass="com.example.App"
```

**C:\Users\ItiShree\Desktop\MAVENTOGRADLEPROJECT\maven-example>mvn exec:java -Dexec.mainClass="com.example.App"**

```
C:\Users\ItiShree\Desktop\MAVENTOGRADLEPROJECT\maven-example>mvn exec:java -Dexec.mainClass="com.example.App"
[INFO] Scanning for projects...
[INFO]
[INFO] -----< com.example:maven-example >-----
[INFO] Building maven-example 1.0-SNAPSHOT
[INFO]    from pom.xml
[INFO] -----[ jar ]-----
[INFO]
[INFO] --- exec:3.5.0:java (default-cli) @ maven-example ---
Hello, Maven
This is the simple realworld example...
Sum of 5 and 10 is 15
```

## Step 5: Migrate the Maven Project to Gradle

1. **Initialize Gradle:** Navigate to the project directory (**gradle-example**) and run:

```
gradle init
```

- It will ask **Found a Maven build. Generate a Gradle build from this?** (default: yes) [yes, no]
  - Type Yes

- **Select build script DSL:**
  - 1: Kotlin
  - 2: Groovy
  - Enter selection (default: Kotlin) [1..2]
    - Type 2
- **Generate build using new APIs and behavior (some features may change in the next minor release)? (default: no) [yes, no]**
  - Type No

```
C:\Users\ItiShree\Desktop\MAVENTOGRADLEPROJECT\maven-example>gradle init
Found a Maven build. Generate a Gradle build from this? (default: yes) [yes, no] yes
Select build script DSL:
 1: Kotlin
 2: Groovy
Enter selection (default: Kotlin) [1..2] 2
Generate build using new APIs and behavior (some features may change in the next minor release)? (default: no) [yes, no] no

> Task :init
Maven to Gradle conversion is an incubating feature.
For more information, please refer to https://docs.gradle.org/8.12/userguide/migrating_from_maven.html in the Gradle documentation.
BUILD SUCCESSFUL in 43s
```

Navigate the project folder and open build.gradle file then add the below code and save it.

```
plugins {
    id 'java'
}

group = 'com.example'

version = '1.0-SNAPSHOT'

repositories {
    mavenCentral()
```

```
}  
  
dependencies {  
    testImplementation 'junit:junit:4.12'  
}  
  
task run(type: JavaExec) {  
    main = 'com.example.App'  
    classpath = sourceSets.main.runtimeClasspath  
}
```

**If project build is not possible**

**C:\Users\ItiShree\Desktop\MAVENTOGRADLEPROJECT\  
maven-example>gradle --refresh-dependencies**

```

C:\Users\ItiShree\Desktop\MAVENTOGRADLEPROJECT\maven-example>gradle --refresh-dependencies
Calculating task graph as configuration cache cannot be reused due to --refresh-dependencies

> Task :help

Welcome to Gradle 8.12.

To run a build, run gradle <task> ...

To see a list of available tasks, run gradle tasks

To see more detail about a task, run gradle help --task <task>

To see a list of command-line options, run gradle --help

For more detail on using Gradle, see https://docs.gradle.org/8.12/userguide/command_line_interface.html
For troubleshooting, visit https://help.gradle.org

[Incubating] Problems report is available at: file:///C:/Users/ItiShree/Desktop/MAVENTOGRADLEPROJECT/maven-example/build/reports/problems/problems-report.html

Deprecated Gradle features were used in this build, making it incompatible with Gradle 9.0.

You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.

For more on this, please refer to https://docs.gradle.org/8.12/userguide/command_line_interface.html#sec:command_line_warnings in the Gradle documentation.

BUILD SUCCESSFUL in 1s
1 actionable task: 1 executed
Configuration cache entry stored.

```

**C:\Users\ItiShree\Desktop\MAVENTOGRADLEPROJECT\maven-example>gradle build --no-configuration-cache**

```

C:\Users\ItiShree\Desktop\MAVENTOGRADLEPROJECT\maven-example>gradle build --no-configuration-cache

[Incubating] Problems report is available at: file:///C:/Users/ItiShree/Desktop/MAVENTOGRADLEPROJECT/maven-example/build/reports/problems/problems-report.html

Deprecated Gradle features were used in this build, making it incompatible with Gradle 9.0.

You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.

For more on this, please refer to https://docs.gradle.org/8.12/userguide/command_line_interface.html#sec:command_line_warnings in the Gradle documentation.

BUILD SUCCESSFUL in 4s
4 actionable tasks: 4 executed

```

## Step 6: Build & Run the Gradle Project

- **Build the Project:** In the project directory (gradle-example), run the below command to build the project:

**C:\Users\ItiShree\Desktop\MAVENTOGRADLEPROJECT\maven-example>gradle build**



```
C:\Users\ItiShree\Desktop\MAVENTOGRADLEPROJECT\maven-example>gradle build
Calculating task graph as no cached configuration is available for tasks: build

[Incubating] Problems report is available at: file:///C:/Users/ItiShree/Desktop/MAVENTOGRADLEPROJECT/maven-example/build/reports/problems/problems-report.html

Deprecated Gradle features were used in this build, making it incompatible with Gradle 9.0.

You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.

For more on this, please refer to https://docs.gradle.org/8.12/userguide/command_line_interface.html#sec:command_line_warnings in the Gradle documentation.

BUILD SUCCESSFUL in 1s
4 actionable tasks: 4 up-to-date
Configuration cache entry stored.
```

- **Run the Application:** Once the build is successful, run the application using below command:

**C:\Users\ItiShree\Desktop\MAVENTOGRADLEPROJECT\maven-example>gradle run**

```
C:\Users\ItiShree\Desktop\MAVENTOGRADLEPROJECT\maven-example>gradle run
Calculating task graph as no cached configuration is available for tasks: run

> Task :run
Hello, Maven
This is the simple realworld example....
Sum of 5 and 10 is 15

[Incubating] Problems report is available at: file:///C:/Users/ItiShree/Desktop/MAVENTOGRADLEPROJECT/maven-example/build/reports/problems/problems-report.html

Deprecated Gradle features were used in this build, making it incompatible with Gradle 9.0.

You can use '--warning-mode all' to show the individual deprecation warnings and determine if they come from your own scripts or plugins.

For more on this, please refer to https://docs.gradle.org/8.12/userguide/command_line_interface.html#sec:command_line_warnings in the Gradle documentation.

BUILD SUCCESSFUL in 1s
2 actionable tasks: 1 executed, 1 up-to-date
Configuration cache entry stored.
```

## Step 7: Verify the Migration

- **Compare the Output:** Make sure that both the **Maven** and **Gradle** builds produce the same output:

### Maven Output:

```
Hello, Maven
This is the simple realworld example....
Sum of 5 and 10 is 15
```

### Gradle Output:

```
Hello, Maven  
This is the simple realworld example....  
Sum of 5 and 10 is 15
```