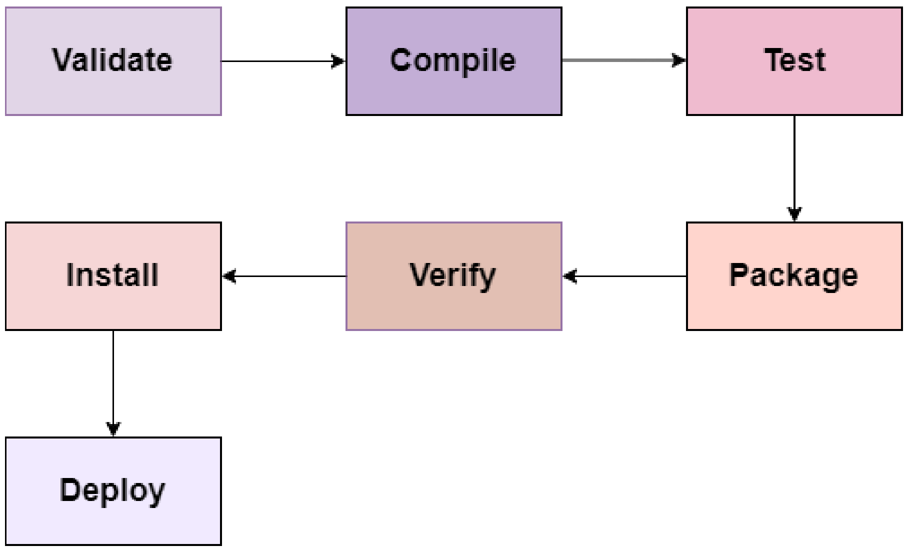
1. Maven Lifecycle



Maven follows a predefined **build lifecycle** consisting of several phases:

1. **Validate** – Checks if the project is correct and all necessary information is available.
2. **Compile** – Compiles the source code of the project.
3. **Test** – Runs unit tests using a testing framework.
4. **Package** – Bundles compiled code into a distributable format (JAR, WAR, etc.).
5. **Verify** – Runs checks to ensure package quality.
6. **Install** – Installs the package into the local repository.
7. **Deploy** – Uploads the package to a remote repository for sharing.

2. What is pom.xml file and why do we use it?

pom.xml (Project Object Model) is the core configuration file in a Maven project. It defines:

- Project metadata (name, version, description).
- Dependencies (third-party libraries).
- Build plugins and configurations.
- Repository information.
- Build lifecycle settings.

It helps automate project builds and manage dependencies efficiently.

3. How do dependencies work?

Dependencies in Maven are managed using <dependencies> in pom.xml. Maven fetches required libraries from remote repositories and adds them to the classpath.

Example:

```
<dependencies>
  <dependency>
    <groupId>org.springframework</groupId>
    <artifactId>spring-core</artifactId>
    <version>5.3.9</version>
  </dependency>
</dependencies>
```

Maven checks dependencies in this order:

1. **Local Repository** (.m2/repository/)
2. **Central Repository** (Maven Central)
3. **Remote Repository** (if configured)

4. Check the Maven Repository

Maven's official repository: **https://mvnrepository.com**
Use the following command to check local repository dependencies:

```
mvn dependency:tree
```

5. How are all modules built using Maven?

Maven builds multi-module projects using a **parent POM**. Running mvn install from the parent project builds all sub-modules in order.

6. Can we build a specific module?

Yes, By using:

```
mvn install -pl module-name -am
```

-pl specifies the module, -am (also make) ensures dependencies are built.

7. **Role of ui.apps, ui.content, and ui.frontend folders**

   - **ui.apps** – Contains code, configurations, and components deployed in AEM.
   - **ui.content** – Holds website content, templates, and assets.
   - **ui.frontend** – Manages frontend dependencies (React, Angular, JavaScript, CSS).

8. **Why do we use Run Modes?**

   Run modes in AEM allow different configurations for different environments (author, publish, dev, prod). Example:

   ```
   -Dsling.run.modes=author,dev
   ```

9. **What is Publish Environment?**

   The **publish** environment in AEM is where content is live and accessible to end-users. It delivers content optimized for performance.

10. **Why do we use Dispatcher?**

    AEM Dispatcher is a caching and security layer used to:

    - Cache pages for performance optimization.
    - Protect AEM instances from excessive requests.
    - Improve load balancing.

11. **From where can we access crx/de?**

    We can access the **CRXDE (Content Repository Extensible Development Environment)** using:

    http://localhost:4502/crx/de/

    This allows us to browse and modify AEM repository content.