[CS304] Tutorial 10 - Software Documentation

Part 1 JavaDoc

JavaDoc tool is a document generator tool in Java programming language for generating standard documentation in HTML format. It generates API documentation. It parses the declarations ad documentation in a set of source file describing classes, methods, constructors, and fields.

Before using JavaDoc tool, you must include JavaDoc comments /**.....*/ providing information about classes, methods, and constructors, etc. For creating a good and understandable document API for any java file you must write better comments for every class, method, constructor.

Example：

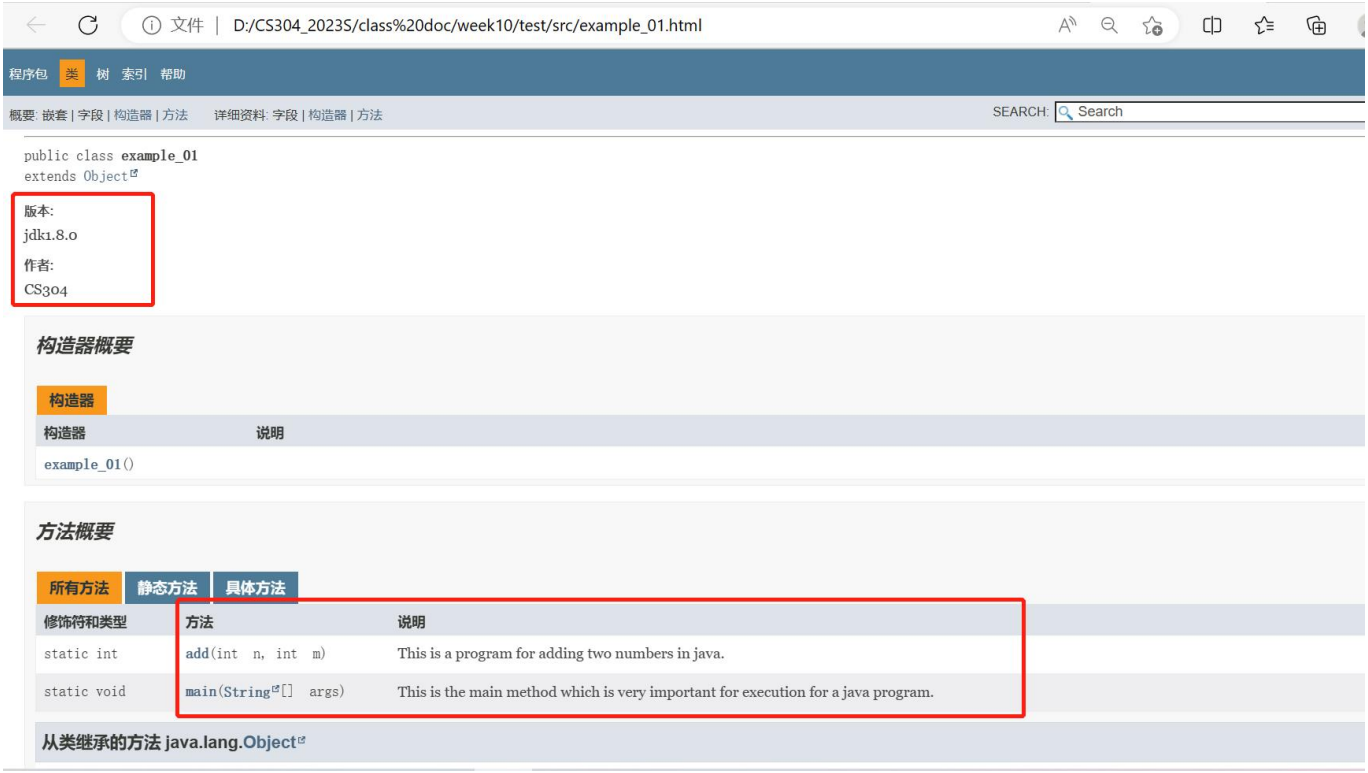
Syntax	Parameter	Description
@author	author_name	Describes an author
@param	description	provide information about method parameter or the input it takes
@version	version-name	provide version of the class, interface or enum.
@return	description	provide the return value

More Tag information links(Official links):
https://docs.oracle.com/javase/8/docs/technotes/tools/windows/javadoc.html

Part 1-1 Start a simple Java program

Creat a simple Java program (int)a+b,please refer attachment(example_01.java),run command-line below the java path:

```
javadoc -d .\javadoc -author -version -encoding UTF-8 -charset UTF-8
example_01.java
```



About command you can refer oracle document below:

https://docs.oracle.com/javase/8/docs/technotes/tools/windows/javadoc.html

javadoc {packages|source-files} [options] [@argfiles]

Part 1-2 Create apidocs for Teedy Project

Generate standalone javadocs for the project

You could add the `Javadoc` Plugin in the section of your pom (if no configuration defined, the plugin uses default values).

Add the following into the pom.xml of Teedy, Then, run `mvn javadoc:javadoc`,which generates apidocs in html format in target/site/apidocs/index.html in each module directory.

```
<project>
  ...

  <build>
    <plugins>

      <plugin>
        <groupId>org.apache.maven.plugins</groupId>
        <artifactId>maven-javadoc-plugin</artifactId>
        <version>3.6.3</version>
        <configuration>
          <failOnError>false</failOnError>
        </configuration>
        <executions>
          <execution>
```

```
            <id>aggregate</id>
            <goals>
              <goal>aggregate</goal>
            </goals>
            <phase>site</phase>
          </execution>
        </executions>
      </plugin>

    </plugins>
  </build>

  ...
</project>
```

reference：

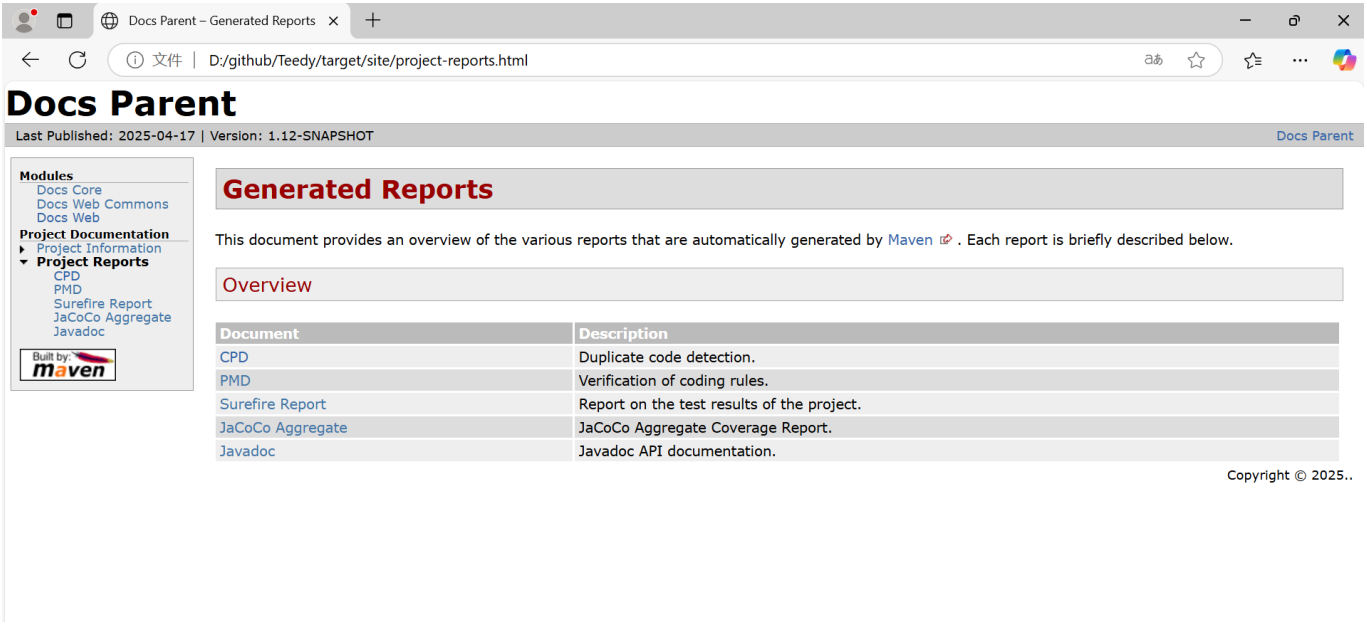
https://maven.apache.org/plugins/maven-javadoc-plugin/index.html

Generate Javadocs As Part Of Project Reports

To generate javadocs as part of the site generation, you should add the `Javadoc` Plugin in the section of your pom: add the following into the pom.xml of Teedy, Then, run `mvn site`,which generates apidocs in html format in target/site/apidocs/index.html in root and module directory.

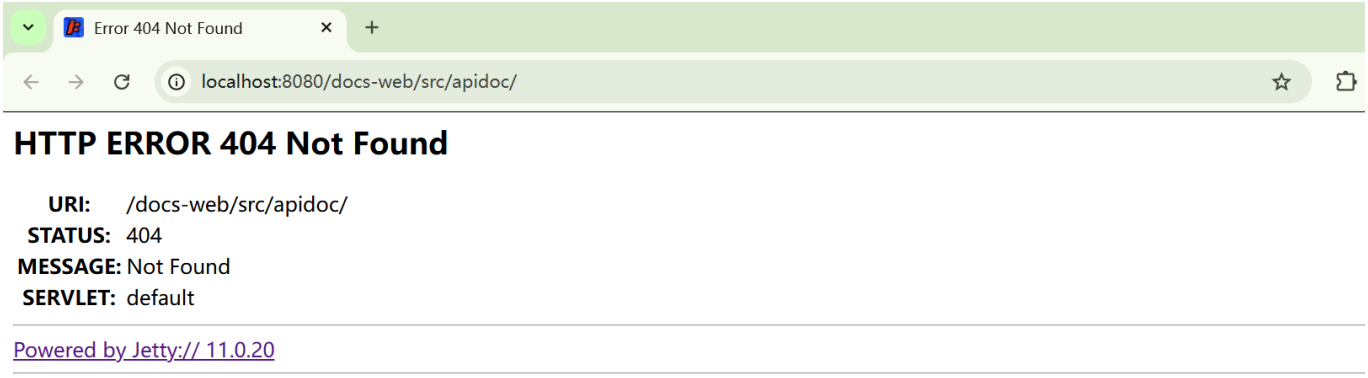
```
<project>
  ...

  <reporting>
    <plugins>
      <plugin>
        <groupId>org.apache.maven.plugins</groupId>
        <artifactId>maven-javadoc-plugin</artifactId>
        <version>3.6.3</version>
        <configuration>
          <failOnError>false</failOnError>
        </configuration>
        <reportSets>
          <reportSet>
            <id>aggregate</id>
            <inherited>false</inherited>
            <reports>
              <report>aggregate</report>
            </reports>
          </reportSet>
          <reportSet>
            <id>default</id>
            <reports>
              <report>javadoc</report>
            </reports>
          </reportSet>
```

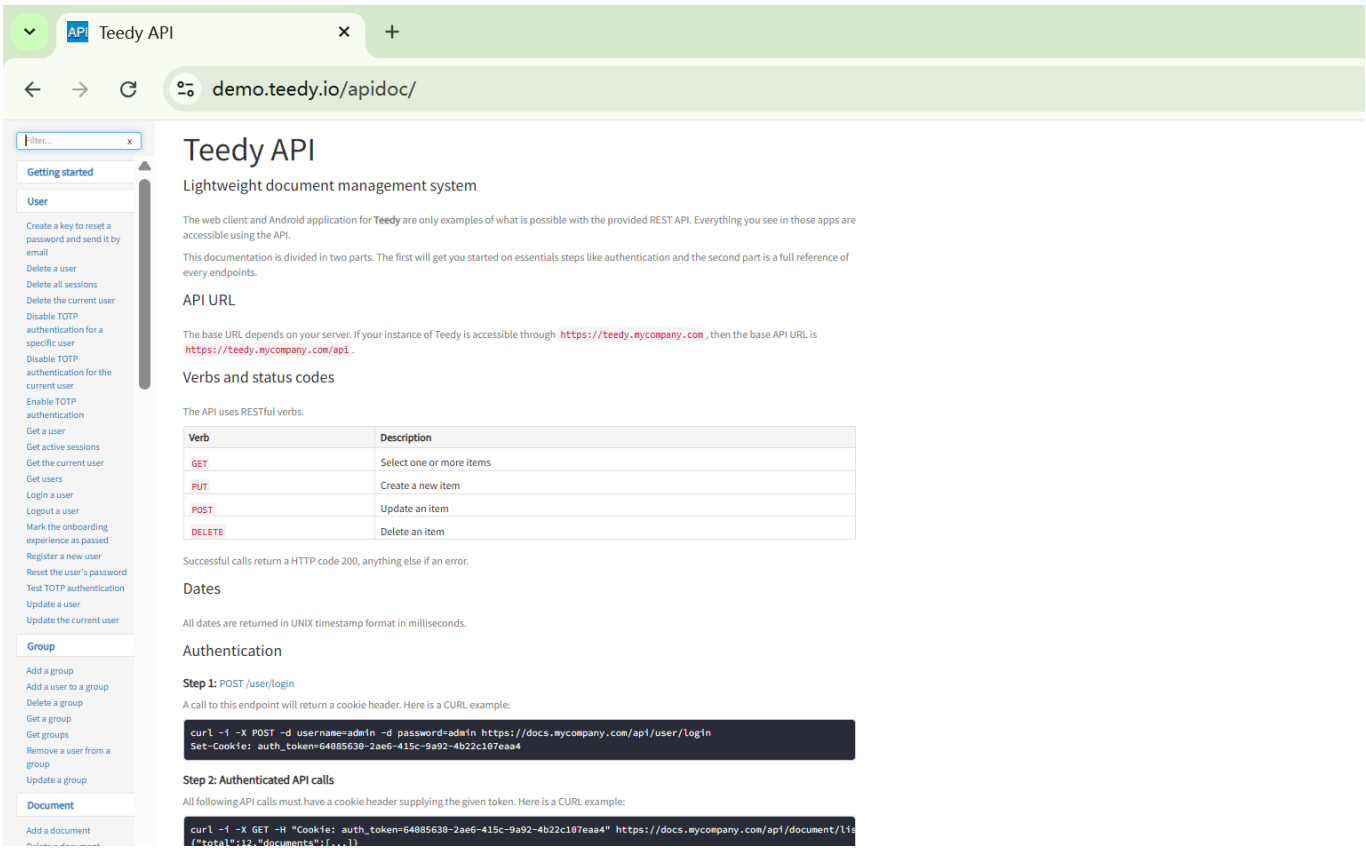
```
        </reportSets>
      </plugin>
    </plugins>
  </reporting>

  ...
</project>
```



Part 2: Deploying Teedy in Production Mode

In our previous practices, we deployed Teedy in development mode. When we clicked the API documentation link in that setup, it returned a 404 error. However, the demo version of Teedy displays the REST API documentation successfully. Why is there such a difference?





This is because our earlier deployment was done in **development mode**, while the demo runs in **production mode**. Defining these two modes provides several benefits:

- Improves development efficiency
- Enhances system security
- Avoids production incidents
- Allocates system resources properly

In short, **Dev mode is designed for developers**, while **Prod mode is meant for users and operational stability**.

Configuration Differences Between Dev and Prod

Let's briefly look at how the `docs-web` submodule of Teedy defines its `dev` and `prod` profiles in `pom.xml`:

Maven Profiles Overview

```
<profiles>
  <!-- Development profile -->
  <profile>
    <id>dev</id>
    <activation>
      <activeByDefault>true</activeByDefault>
      <property>
        <name>env</name>
        <value>dev</value>
      </property>
    </activation>
    <build>
      <resources>
        <resource>
          <directory>src/dev/resources</directory>
          <filtering>false</filtering>
          <excludes>
            <exclude>**/config.properties</exclude>
          </excludes>
        </resource>
        <resource>
          <directory>src/dev/resources</directory>
          <filtering>true</filtering>
          <includes>
            <include>**/config.properties</include>
          </includes>
        </resource>
      </resources>
      <plugins>
        <plugin>
          <groupId>org.eclipse.jetty</groupId>
          <artifactId>jetty-maven-plugin</artifactId>
          <configuration>
            <systemProperties>
              <application.mode>dev</application.mode>
              <docs.home>../data/docs</docs.home>
            </systemProperties>
            <webApp>
              <contextPath>/docs-web</contextPath>
              <overrideDescriptor>${project.basedir}/src/dev/main/webapp/web-
override.xml</overrideDescriptor>
            </webApp>
```

```
          </configuration>
        </plugin>
      </plugins>
    </build>
  </profile>

  <!-- Production profile -->
  <profile>
    <id>prod</id>
    <build>
      <resources>
        <resource>
          <directory>src/prod/resources</directory>
          <filtering>false</filtering>
          <excludes>
            <exclude>**/config.properties</exclude>
          </excludes>
        </resource>
        <resource>
          <directory>src/prod/resources</directory>
          <filtering>true</filtering>
          <includes>
            <include>**/config.properties</include>
          </includes>
        </resource>
      </resources>
      <plugins>
        <!-- Launch NPM & Grunt -->
        <plugin>
          <groupId>org.apache.maven.plugins</groupId>
          <artifactId>maven-antrun-plugin</artifactId>
          <executions>
            <execution>
              <phase>generate-sources</phase>
              <configuration>
                <target name="building">
                  <exec executable="npm" dir="${project.basedir}/src/main/webapp"
osfamily="unix" failonerror="true">
                    <arg line="install" />
                  </exec>
                  <exec executable="grunt"
dir="${project.basedir}/src/main/webapp" osfamily="unix" failonerror="true">
                    <arg line="--apiurl=api" />
                  </exec>
                </target>
              </configuration>
              <goals>
                <goal>run</goal>
              </goals>
            </execution>
          </executions>
        </plugin>

        <!-- WAR generation -->
```

```
        <plugin>
          <groupId>org.apache.maven.plugins</groupId>
          <artifactId>maven-war-plugin</artifactId>
          <configuration>

<warSourceDirectory>${project.basedir}/src/main/webapp/dist</warSourceDirectory>
            <webXml>src/main/webapp/WEB-INF/web.xml</webXml>
          </configuration>
        </plugin>
      </plugins>
    </build>
  </profile>
</profiles>
```

Key Differences

1. Resource Paths

- **Dev** uses `src/dev/resources`.
- **Prod** uses `src/prod/resources`.

Both allow filtering of `config.properties`.

2. Plugin Configuration

- **Dev**: Uses `jetty-maven-plugin` to quickly launch an embedded Jetty server.
- **Prod**: Uses `maven-antrun-plugin` to run `npm install` and `grunt` to build frontend resources. Uses `maven-war-plugin` to package a WAR file.

3. System Properties

- **Dev**: Sets `application.mode=dev` and `docs.home=../data/docs`.
- **Prod**: Relies on default production properties.

4. Build Goals

- **Dev**: Optimized for fast development and testing.
- **Prod**: Optimized for bundling, minification, and deployment.

Deploying Teedy in Production Mode Locally

1. Prerequisites

Make sure the Teedy environment is properly installed. For details, refer to **Tutorial 2 → Part 2: Teedy Native Installation → Environment Setup**.

Run the following command to globally install the Grunt CLI:

```
sudo npm install -g grunt-cli
```

This installs the Grunt command-line interface, allowing you to run Grunt tasks defined in the `Gruntfile.js`, which include:

- Cleaning temporary directories
- Annotating AngularJS files
- Concatenating and minifying JS/CSS
- Compiling LESS
- Handling Angular templates
- Generating REST API documentation

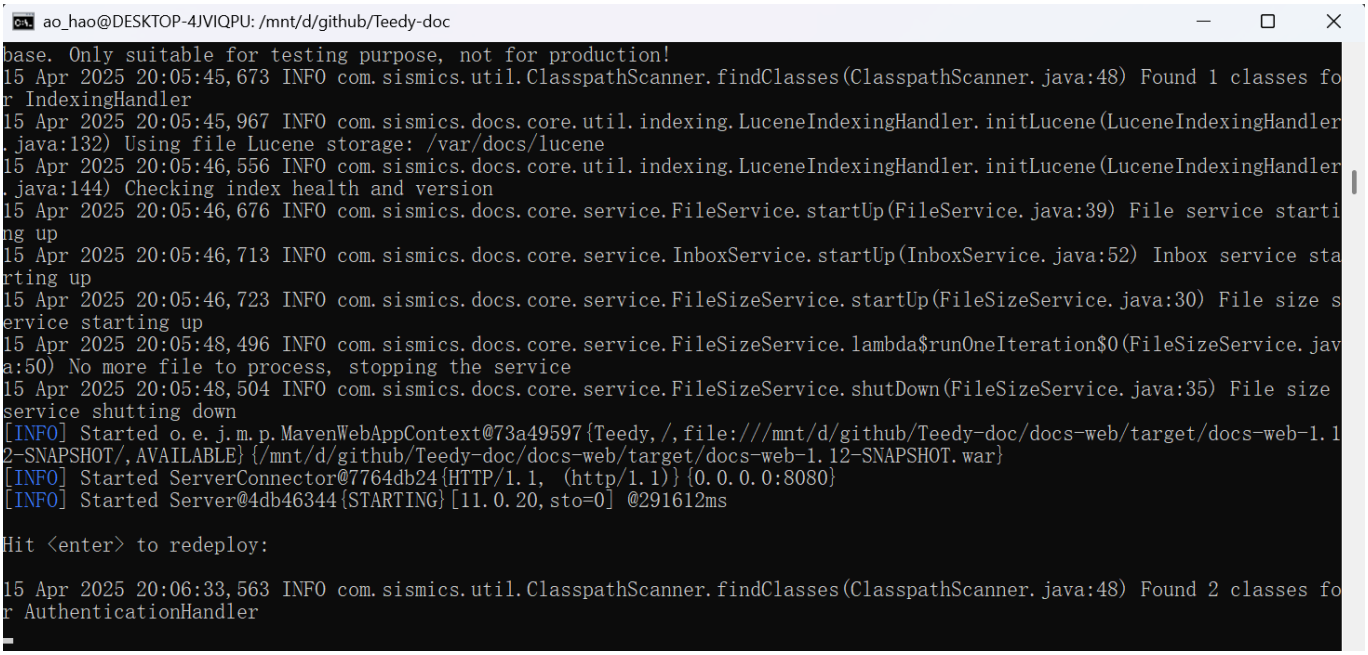
Refer to `docs-web/src/main/webapp/Gruntfile.js` for full task details. Make sure the both npm and Grunt are working correctly:

```
ao_hao@DESKTOP-4JVIQPU:/mnt/d/github/Teedy$ npm --version
9.2.0
ao_hao@DESKTOP-4JVIQPU:/mnt/d/github/Teedy$ grunt --version
grunt-cli v1.5.0

grunt v1.6.1
```

2. Build and Run Production Mode

Activate the `prod` profile explicitly:

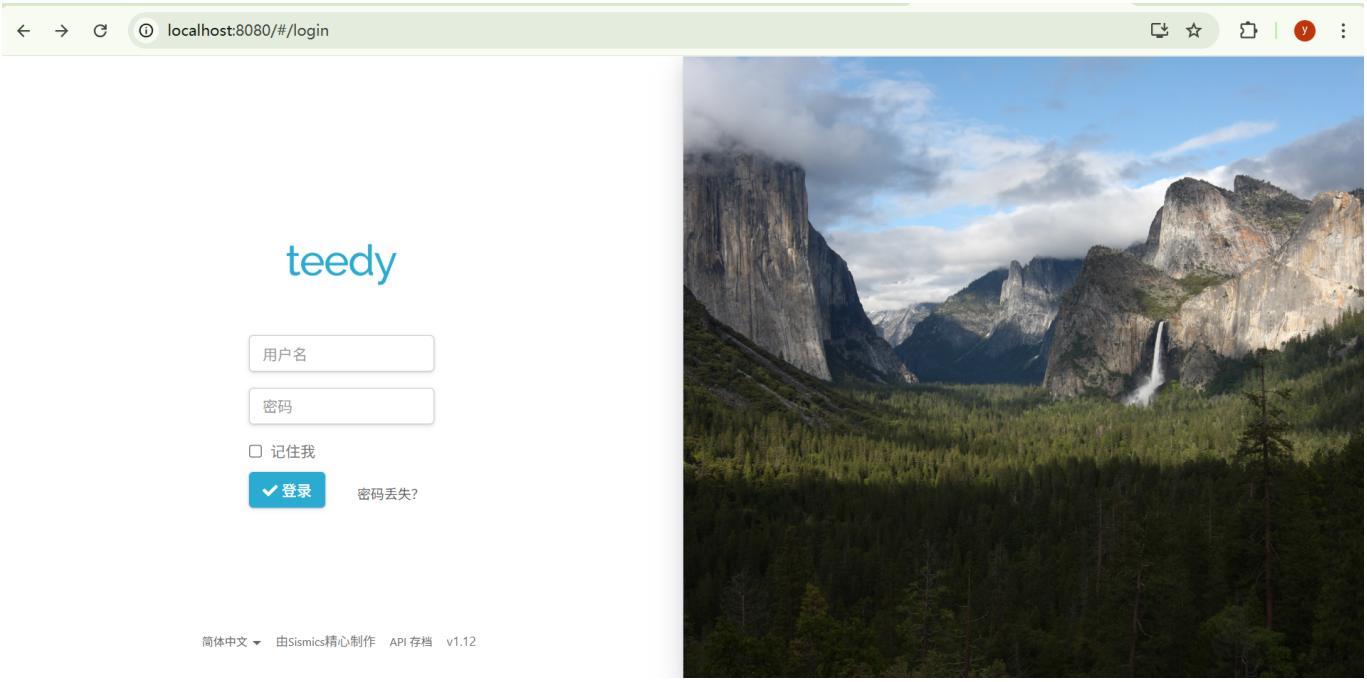
```
mvn clean install -Pprod -DskipTests
mvn jetty:run-war -Pprod -DskipTests
```



3. Access the Production Instance

Open your browser and go to:

```
http://localhost:8080
```

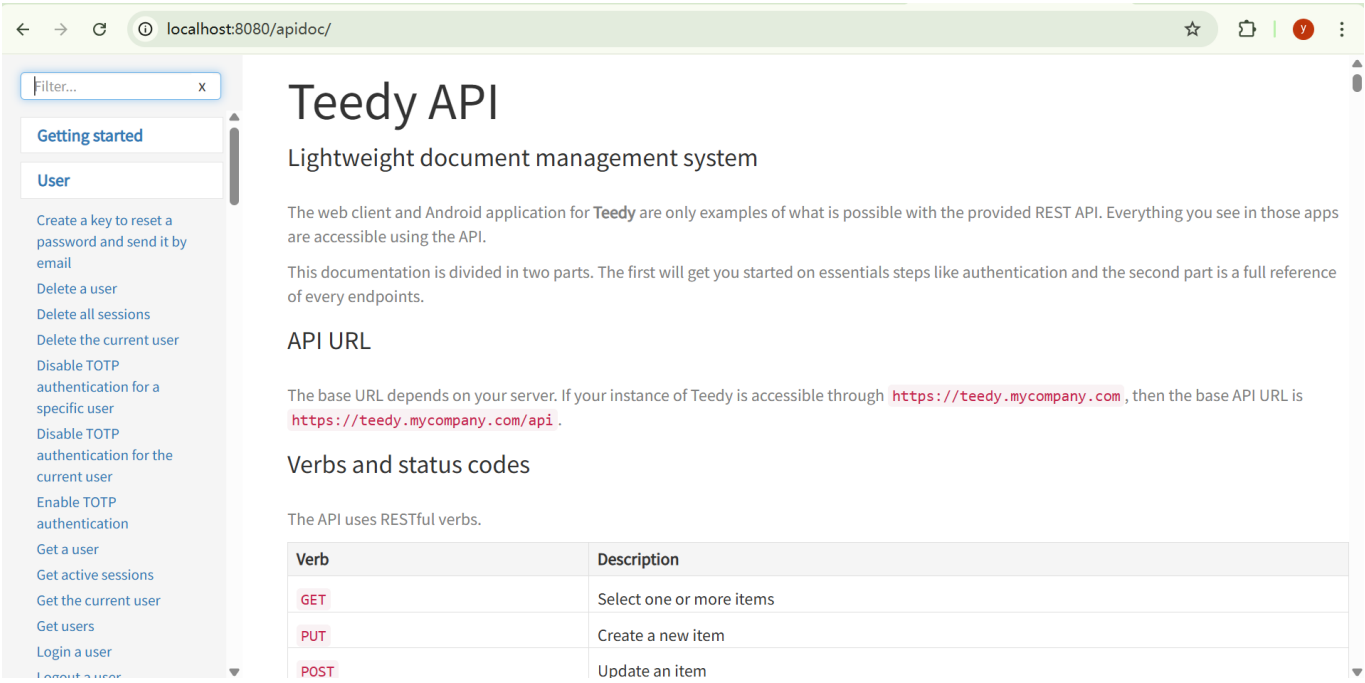


4. Access the REST API Documentation

Click the **API 存档** link at the bottom, or visit:

```
http://localhost:8080/apidoc/
```

You should now see the Grunt-generated API documentation.



Part 3: Teedy REST API Documentation Generation

1. Setup and Build

In the `docs-web` directory, the `pom.xml` refers to two core commands used to install packages and trigger the build process:

```
# Run from the docs-web directory
npm install
# Build the project
grunt --apiurl=api
```

Running `npm install` without arguments automatically installs all dependencies listed under both **dependencies** and **devDependencies** in the `package.json` file into the `node_modules` directory.

The `grunt` command initiates the build process according to the configuration defined in `Gruntfile.js`, which includes generating the REST API documentation.

2. Key configuration

`package.json` Excerpt

```
"devDependencies": {
    "grunt-apidoc": "^0.11.0"
},
"apidoc": {
    "name": "Teedy API",
    "title": "Teedy API",
    "url": "/api",
    "template": {
      "withCompare": false,
      "withGenerator": false
    },
    "order": [
      "User",
      "Group",
      "Document",
      "File",
      "Tag",
      "Comment",
      "Share",
      "Acl",
      "Auditlog",
      "App",
      "Theme",
      "Vocabulary"
    ],
    "header": {
      "title": "Getting started",
```

```
        "filename": "header.md"
      }
  },
```

Teedy uses a `Gruntfile.js` located at `docs-web/src/main/webapp/` to define build tasks. The key part for API doc generation is:

`Gruntfile.js` Excerpt

```
apidoc: {
  generate: {
    src: '../java/',
    dest: 'dist/apidoc/'
  }
}
```

This tells Grunt to run the `apidoc` tool on the Java source files in `../java/`, outputting documentation to `dist/apidoc/`.

The full build pipeline (default task) also includes compiling JavaScript, LESS, and templates, followed by optimization steps like minification and string replacements.

3. `apidoc` Introduction

The documentation comments for `apidoc` are written directly above controller methods in the Java code using special annotations. Here's a simple example:

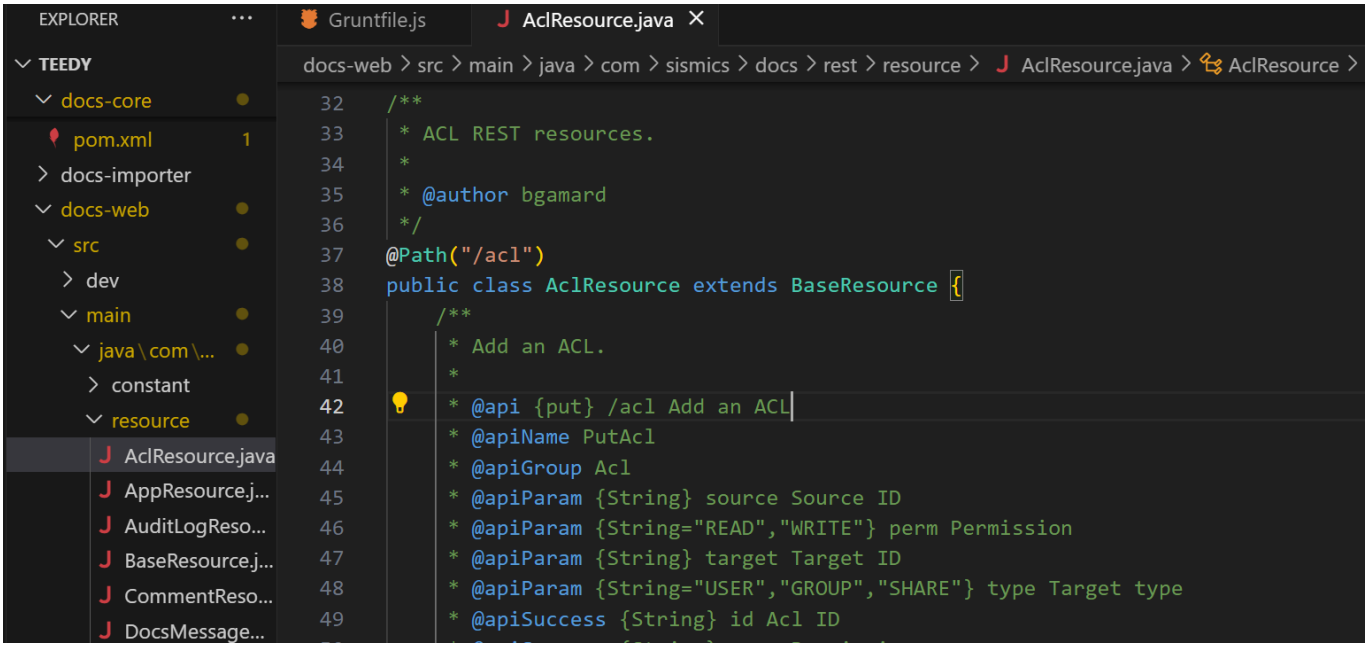
```
/**
 * @api {get} /user/:id Get user by ID
 * @apiName GetUser
 * @apiGroup User
 *
 * @apiParam {Number} id User's unique ID.
 *
 * @apiSuccess {String} id User ID.
 * @apiSuccess {String} name Name of the User.
 */
public User getUser(int id) {
  // implementation
    ...
}
```

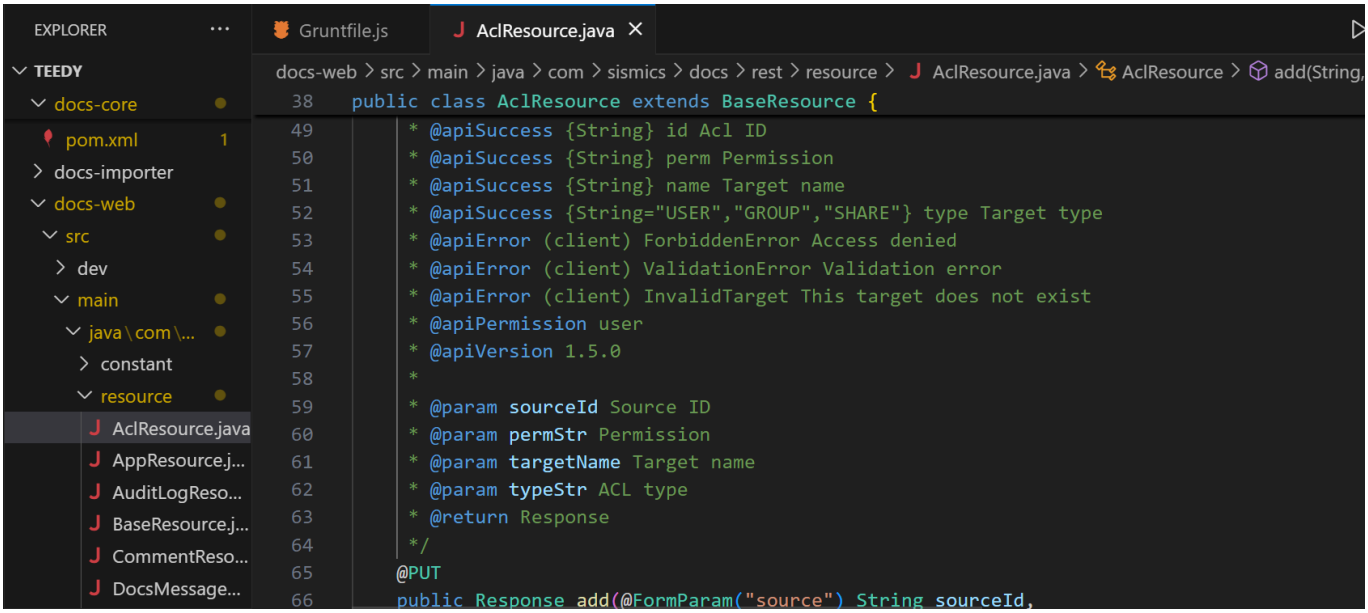
Common `apidoc` Annotations:

Annotation	Description
`@api {method} path description`	Defines the endpoint

Annotation	Description
`@apiName`	Internal identifier
`@apiGroup`	Logical grouping (e.g., User, Document)
`@apiParam`	Parameters passed to the API
`@apiSuccess`	Response structure

The output is a clean HTML page showing all endpoints, parameters, and example responses.





Acl - Add an ACL

PUT

```
/api/acl
```

权限: user

参数

字段	类型	描述
source	String	Source ID
perm	String	Permission 允许值: "READ", "WRITE"
target	String	Target ID
type	String	Target type 允许值: "USER", "GROUP", "SHARE"

Success 200

字段	类型	描述
id	String	Acl ID
perm	String	Permission
name	String	Target name
type	String	Target type 允许值: "USER", "GROUP", "SHARE"

Client error

名称	描述
ForbiddenError	Access denied
ValidationError	Validation error
InvalidTarget	This target does not exist

4. Alternative: Swagger(OpenAPI) with Grunt

Teedy uses `apidoc`, but `grunt` can also work with Swagger (now called OpenAPI). Swagger provides interactive API documentation and uses a different annotation format in Java:

OpenAPI Annotation Example

Here's a simple example using **OpenAPI 3** annotations::

```
import io.swagger.v3.oas.annotations.Operation;
import io.swagger.v3.oas.annotations.Parameter;
import io.swagger.v3.oas.annotations.tags.Tag;
import org.springframework.web.bind.annotation.*;

@RestController
@RequestMapping("/user")
```

```
@Tag(name = "User", description = "Operations related to users")
public class UserController {

    @Operation(summary = "Get a user by ID", description = "Returns a single
user")
    @GetMapping("/{id}")
    public User getUser(
        @Parameter(description = "ID of the user", required = true)
        @PathVariable Integer id) {
        // implementation
        ...
    }
}
```

Common `OpenAPI` Annotations:

Annotation	Description
`@Operation`	Describes a single API operation (e.g., summary, description).
`@Parameter`	Documents parameters (e.g., path, query, body).
`@Tag`	Groups endpoints for better organization.
`@ApiResponse`	(Optional) Describes possible HTTP responses.

These annotations are processed at runtime or compile-time to generate an **OpenAPI spec** (YAML or JSON). You can then:

- Use `swagger-ui` to create an interactive HTML interface.
- Or use a **Grunt task** to copy/move static docs into your distribution folder (`dist/`).