WEB APPLICATIONS WITH SERVLETS AND JSP

OBJECT ORIENTED PROGRAMMING I

Sercan Külcü | Object Oriented Programming I | 10.01.2023

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Introduction

Web applications have become a crucial part of modern software development. They allow users to interact with software through a web browser, making it easier to access and use. In Java, web applications can be developed using Servlets and JSP (JavaServer Pages). In this chapter, we will explore the basics of building web applications with Servlets and JSP.

Servlets

Servlets are Java classes that are used to extend the functionality of a web server. They receive and respond to HTTP requests, which makes them an important part of web applications. Servlets are part of the Java Servlet API, which provides a standard interface for building web applications in Java.

To create a Servlet, you need to extend the HttpServlet class and override the doGet() or doPost() method. The doGet() method is used to handle HTTP GET requests, while the doPost() method is used to handle HTTP POST requests.

JSP

JSP is a technology used to build dynamic web pages. JSP pages are a combination of HTML, Java code, and JSP tags. When a JSP page is requested by a web browser, the JSP engine compiles the page into a servlet, which is then executed by the web server.

JSP pages can be used to generate dynamic content, such as HTML pages that contain data from a database or user input. JSP pages can also be used to include other JSP pages, which makes it easy to reuse code.

JSP tags

JSP tags are special markers that are used to embed Java code or JSP elements in a JSP page. There are three types of JSP tags: directive tags, action tags, and expression tags.

Directive tags are used to provide instructions to the JSP engine, such as which Java classes to import or which error page to display in case of an exception.

Action tags are used to perform actions on the server, such as forwarding a request to another page or including another page in the current page.

Expression tags are used to embed Java expressions in a JSP page, which can be used to display dynamic content.

Web Application Architecture

Web applications are typically designed using a layered architecture. The three layers are the presentation layer, the business layer, and the data access layer.

The presentation layer is responsible for displaying the user interface to the user. This layer is typically implemented using JSP pages and Servlets.

The business layer is responsible for implementing the business logic of the application. This layer is typically implemented using Java classes.

The data access layer is responsible for interacting with the database. This layer is typically implemented using JDBC or an Object Relational Mapping (ORM) framework, such as Hibernate or JPA.

Web Application Development with Servlets and JSP

To develop a web application with Servlets and JSP, you need to follow these steps:

Define the project structure - create a directory structure for your web application project.

Write the Servlet code - create a Servlet by extending the HttpServlet class and overriding the doGet() or doPost() method.

Write the JSP code - create a JSP page by combining HTML, Java code, and JSP tags.

Configure the web.xml file - define the Servlet mapping and JSP file location in the web.xml file.

Deploy the application - deploy the web application to a web server, such as Apache Tomcat or Jetty.

Conclusion

Servlets and JSP are powerful tools for building web applications in Java. Servlets allow you to extend the functionality of a web server and handle HTTP requests. JSP allows you to build dynamic web pages that can display data from a database or user input. JSP tags provide a convenient way to embed Java code and JSP elements in a JSP page. Web applications are typically designed using a layered architecture, which separates the presentation layer, the business layer, and the data access layer. By mastering these basic concepts, you can build powerful web applications that are easy to maintain and extend.