

next →

## Servlets | Servlet Tutorial



**Servlet** technology is used to create a web application (resides at server side and generates a dynamic web page).

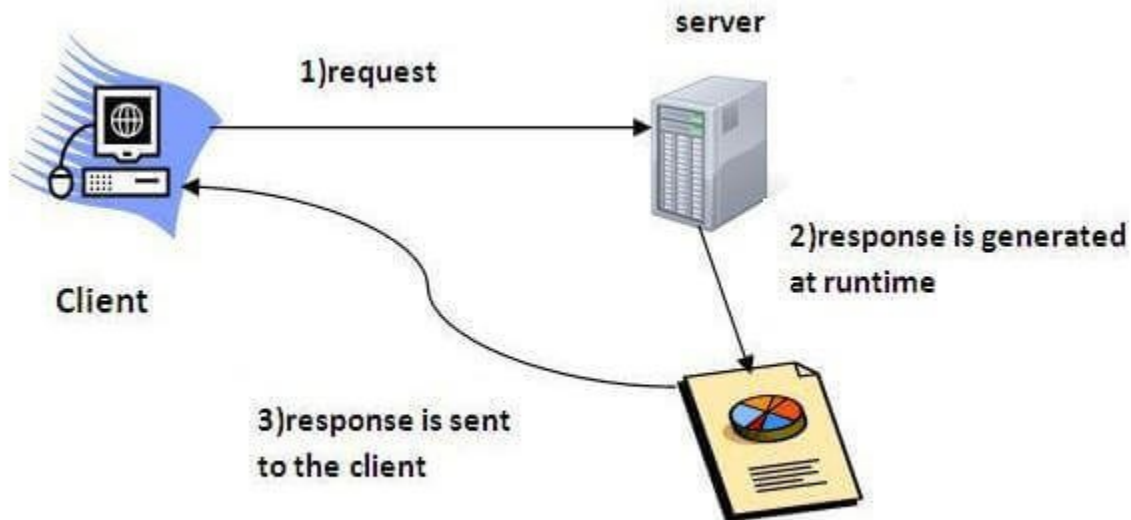
**Servlet** technology is robust and scalable because of java language. Before Servlet, CGI (Common Gateway Interface) scripting language was common as a server-side programming language. However, there were many disadvantages to this technology. We have discussed these disadvantages below.

There are many interfaces and classes in the Servlet API such as Servlet, GenericServlet, HttpServlet, ServletRequest, ServletResponse, etc.

### What is a Servlet?

Servlet can be described in many ways, depending on the context.

- Servlet is a technology which is used to create a web application.
- Servlet is an API that provides many interfaces and classes including documentation.
- Servlet is an interface that must be implemented for creating any Servlet.
- Servlet is a class that extends the capabilities of the servers and responds to the incoming requests. It can respond to any requests.
- Servlet is a web component that is deployed on the server to create a dynamic web page.



## Do You Know?

- What is the web application and what is the difference between Get and Post request?
- What information is received by the web server if we request for a Servlet?
- How to run servlet in Eclipse, MyEclipse and Netbeans IDE?
- What are the ways for servlet collaboration and what is the difference between RequestDispatcher and sendRedirect() method?
- What is the difference between ServletConfig and ServletContext interface?
- How many ways can we maintain the state of a user? Which approach is mostly used in web development?
- How to count the total number of visitors and whole response time for a request using Filter?
- How to run servlet with annotation?
- How to create registration form using Servlet and Oracle database?
- How can we upload and download the file from the server?

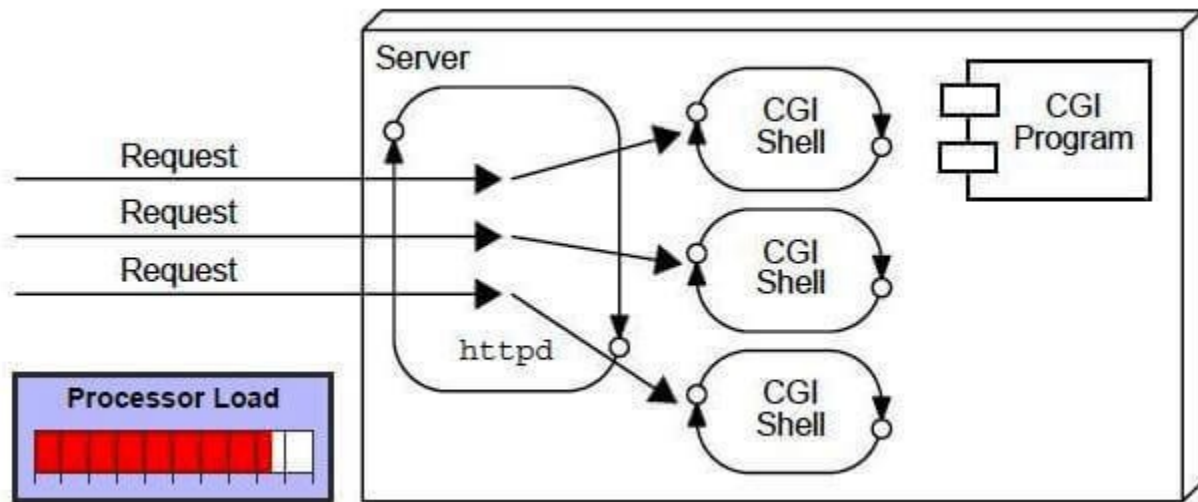
## What is a web application?

A web application is an application accessible from the web. A web application is composed of **web components like Servlet, JSP, Filter, etc.** and other elements such as HTML, CSS, and JavaScript. The **web components typically execute in Web Server and respond to the HTTP request.**

---

## CGI (Common Gateway Interface)

CGI technology enables the web server to call an external program and pass HTTP request information to the external program to process the request. For each request, it starts a new process.

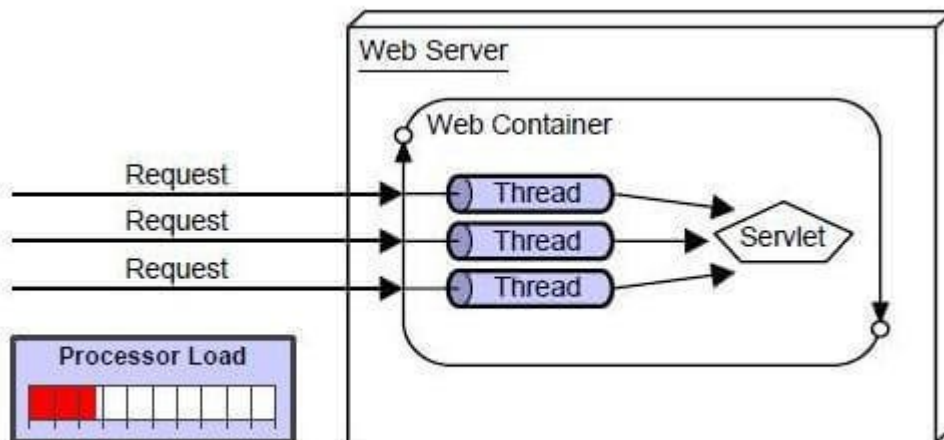


## Disadvantages of CGI

There are many problems in CGI technology:

1. If the number of clients increases, it takes more time for sending the response.
2. For each request, it starts a process, and the web server is limited to start processes.
3. It uses platform dependent language e.g. C, C++, perl.

## Advantages of Servlet



There are many advantages of Servlet over CGI. The web container creates threads for handling the multiple requests to the Servlet. Threads have many benefits over the Processes such as they share a common memory area, lightweight, cost of communication between the threads are low. The advantages of Servlet are as follows:

1. **Better performance:** because it creates a thread for each request, not process.
2. **Portability:** because it uses Java language.
3. **Robust:** JVM manages Servlets, so we don't need to worry about the memory leak, garbage collection, etc.
4. **Secure:** because it uses java language.

---

---

---

next →

---

---

---

---

---

---

---

## Servlet API

The `javax.servlet` and `javax.servlet.http` packages represent interfaces and classes for servlet api.

The **`javax.servlet`** package contains many interfaces and classes that are used by the servlet or web container. These are not specific to any protocol.

The **`javax.servlet.http`** package contains interfaces and classes that are responsible for http requests only.

Let's see what are the interfaces of `javax.servlet` package.

### Interfaces in `javax.servlet` package

There are many interfaces in `javax.servlet` package. They are as follows:

1. Servlet
2. ServletRequest
3. ServletResponse
4. RequestDispatcher
5. ServletConfig
6. ServletContext
7. SingleThreadModel
8. Filter
9. FilterConfig
10. FilterChain
11. ServletRequestListener
12. ServletRequestAttributeListener
13. ServletContextListener
14. ServletContextAttributeListener

### Classes in `javax.servlet` package

There are many classes in `javax.servlet` package. They are as follows:

1. GenericServlet
2. ServletInputStream
3. ServletOutputStream
4. ServletRequestWrapper
5. ServletResponseWrapper
6. ServletRequestEvent
7. ServletContextEvent
8. ServletRequestAttributeEvent

- 9. ServletContextAttributeEvent
- 10. ServletException
- 11. UnavailableException

---

### Interfaces in javax.servlet.http package

There are many interfaces in javax.servlet.http package. They are as follows:

- 1. HttpServletRequest
- 2. HttpServletResponse
- 3. HttpSession
- 4. HttpSessionListener
- 5. HttpSessionAttributeListener
- 6. HttpSessionBindingListener
- 7. HttpSessionActivationListener
- 8. HttpSessionContext (deprecated now)

### Classes in javax.servlet.http package

There are many classes in javax.servlet.http package. They are as follows:

- 1. HttpServlet
- 2. Cookie
- 3. HttpServletRequestWrapper
- 4. HttpServletResponseWrapper
- 5. HttpSessionEvent
- 6. HttpSessionBindingEvent
- 7. HttpUtils (deprecated now)

<<prev next>>

---

---

---

---

---

---

---

---

# Servlet Interface

 [javatpoint.com/Servlet-interface](https://javatpoint.com/Servlet-interface)

[<<prev](#)

**Servlet interface provides** common behavior to all the servlets. Servlet interface defines methods that all servlets must implement.

Servlet interface needs to be implemented for creating any servlet (either directly or indirectly). It provides 3 life cycle methods that are used to initialize the servlet, to service the requests, and to destroy the servlet and 2 non-life cycle methods.

## Methods of Servlet interface

There are 5 methods in Servlet interface. The init, service and destroy are the life cycle methods of servlet. These are invoked by the web container.

Method	Description
<b>public void init(ServletConfig config)</b>	initializes the servlet. It is the life cycle method of servlet and invoked by the web container only once.
<b>public void service(ServletRequest request, ServletResponse response)</b>	provides response for the incoming request. It is invoked at each request by the web container.
<b>public void destroy()</b>	is invoked only once and indicates that servlet is being destroyed.
<b>public ServletConfig getServletConfig()</b>	returns the object of ServletConfig.
<b>public String getServletInfo()</b>	returns information about servlet such as writer, copyright, version etc.

## Servlet Example by implementing Servlet interface

Let's see the simple example of servlet by implementing the servlet interface.

[<<prev next>>](#)

```
import java.io.*;
import javax.servlet.*;

public class First implements Servlet{
    ServletConfig config=null;

    public void init(ServletConfig config){
        this.config=config;
        System.out.println("servlet is initialized");
    }

    public void service(ServletRequest req,ServletResponse res)
        throws IOException,ServletException{

        res.setContentType("text/html");

        PrintWriter out=res.getWriter();
        out.print("<html><body>");
        out.print("<b>hello simple servlet</b>");
        out.print("</body></html>");

    }
    public void destroy(){System.out.println("servlet is destroyed");}
    public ServletConfig getServletConfig(){return config;}
    public String getServletInfo(){return "copyright 2007-1010";}

}
```



[next>>](#) [<<prev](#)

## Creating Servlet Example in Eclipse

Eclipse is an open-source ide for developing JavaSE and JavaEE (J2EE) applications. You can download the eclipse ide from the eclipse website <http://www.eclipse.org/downloads/>.

You need to download the eclipse ide for JavaEE developers.

Creating **servlet example in eclipse ide**, saves a lot of work to be done. It is easy and simple to create a servlet example. Let's see the steps, you need to follow to create the first servlet example.

- Create a Dynamic web project
- create a servlet
- add servlet-api.jar file
- Run the servlet

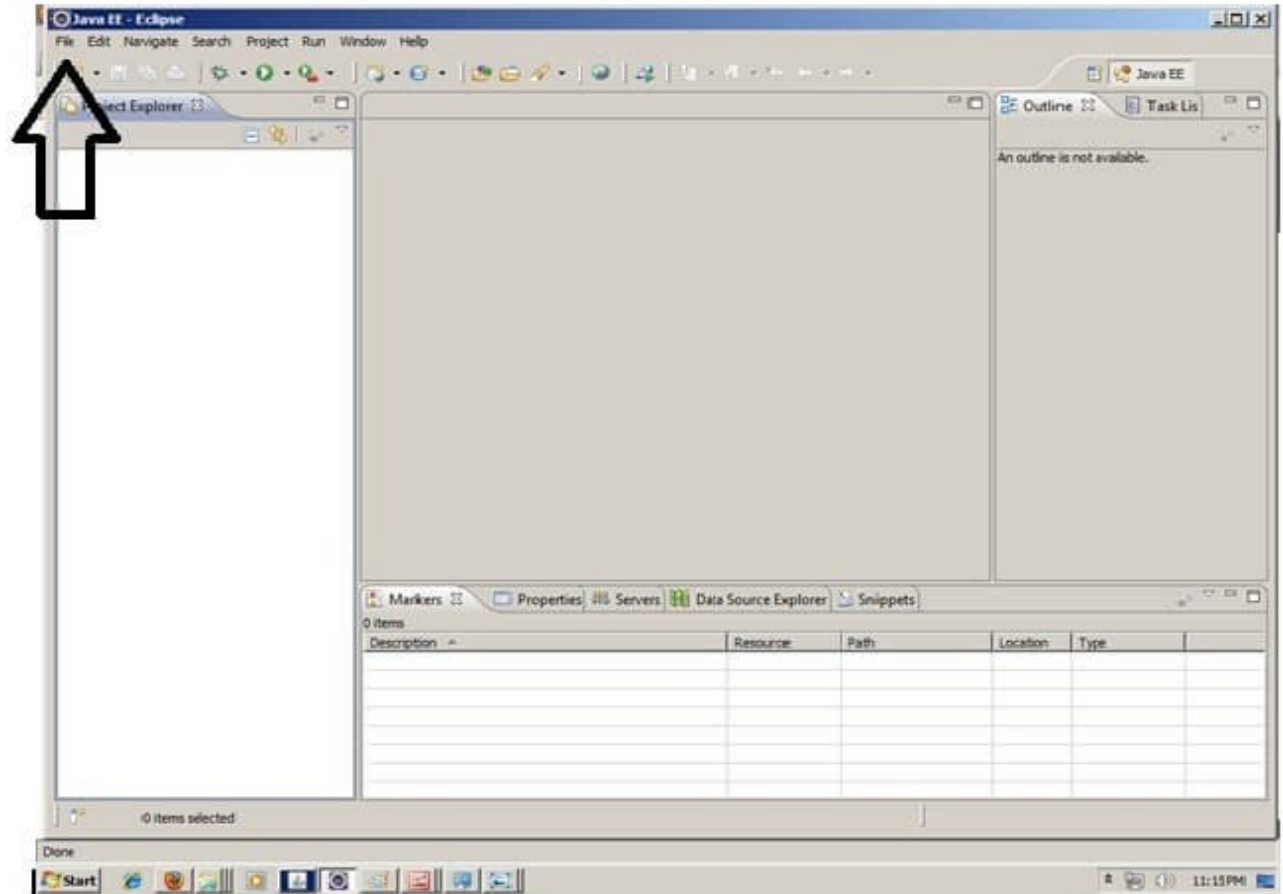
---

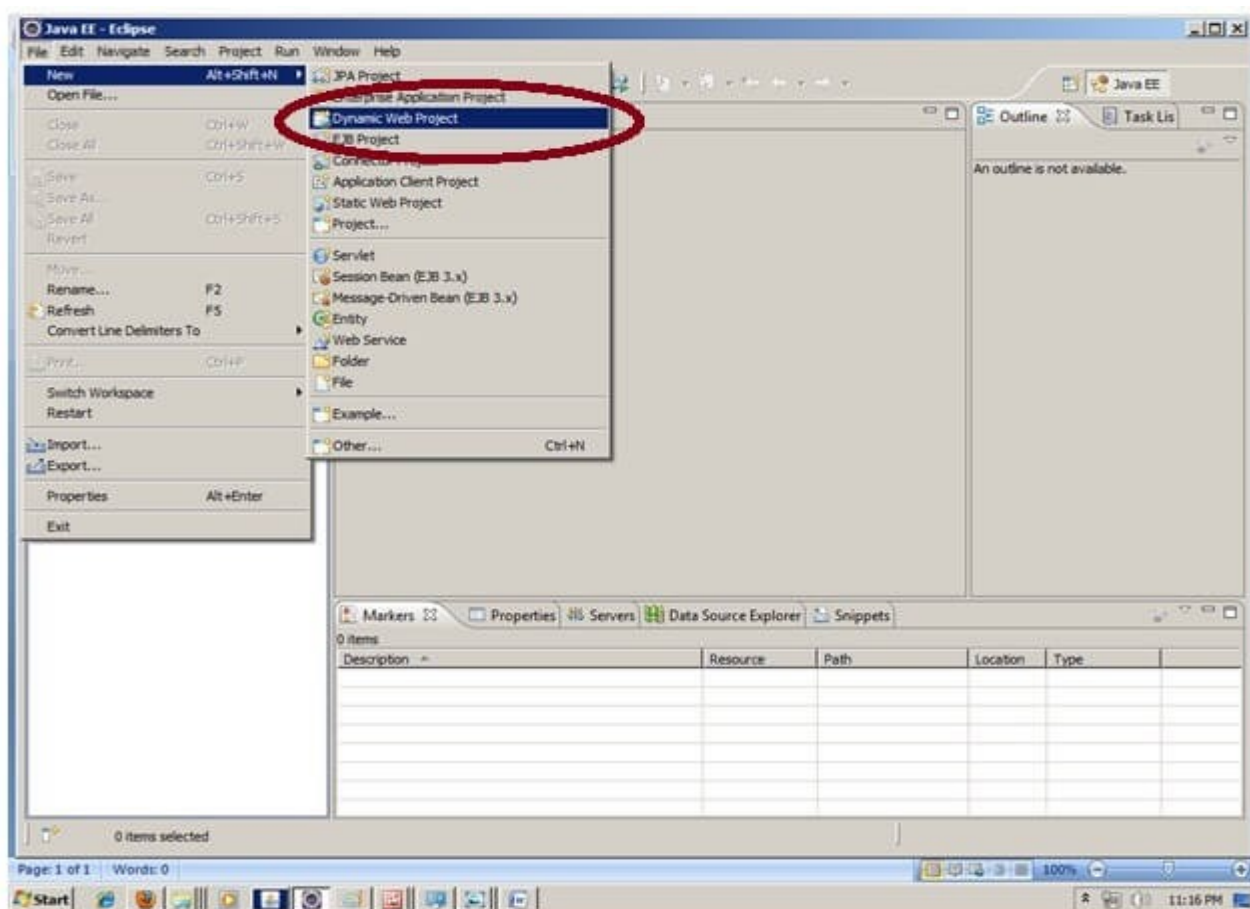
download this example (developed in eclipse)

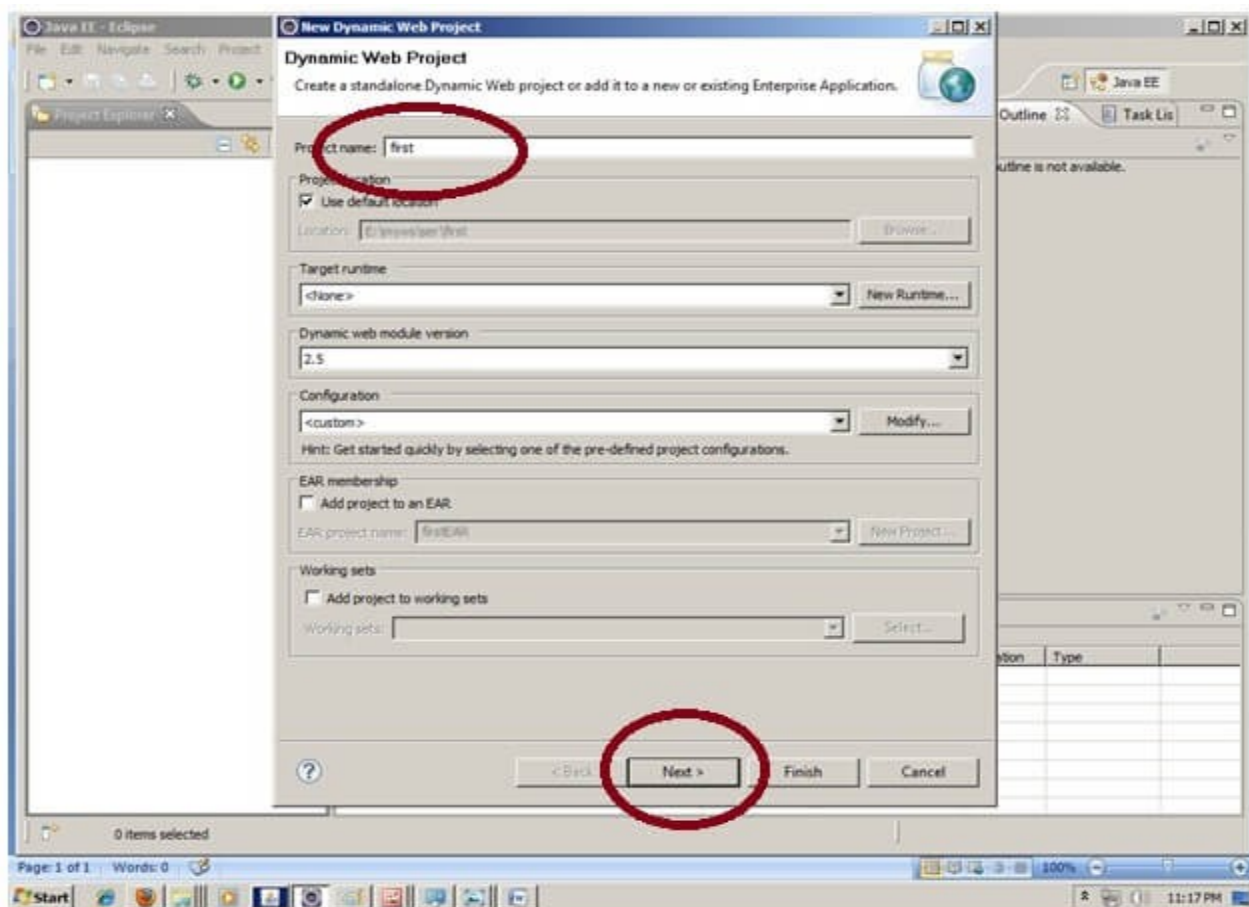
---

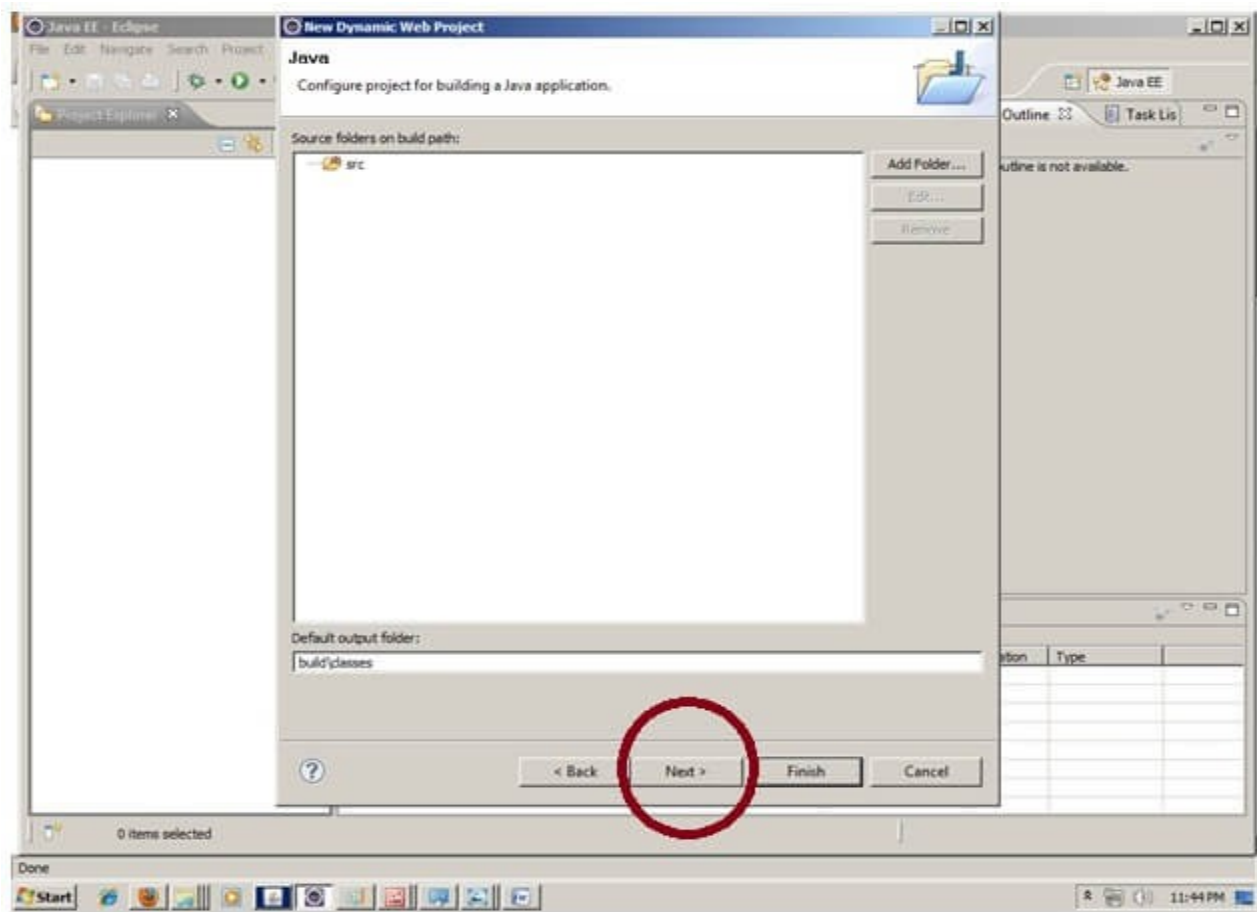
### 1) Create the dynamic web project:

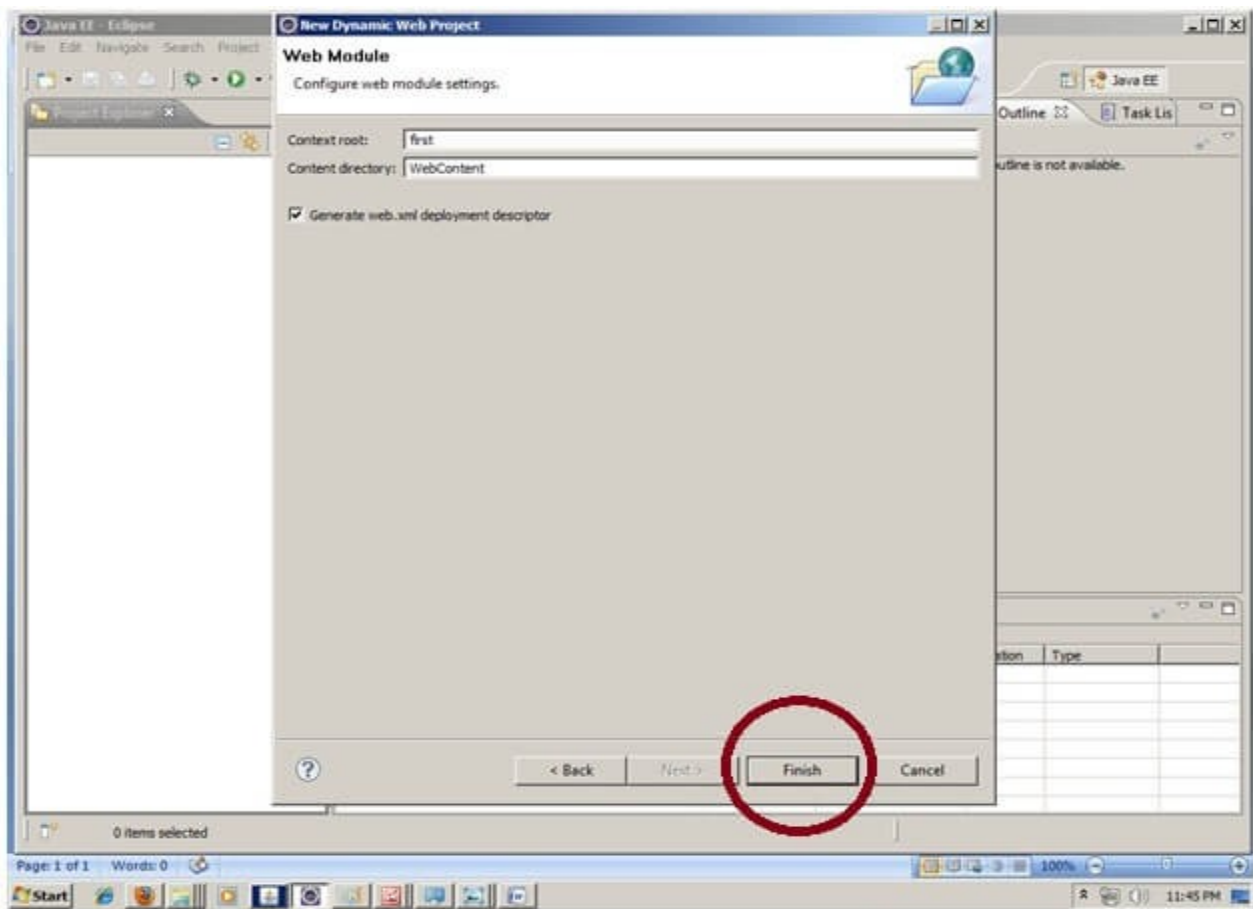
For creating a dynamic web project **click on File Menu -> New -> Project...-> Web -> dynamic web project -> write your project name e.g. first -> Finish.**

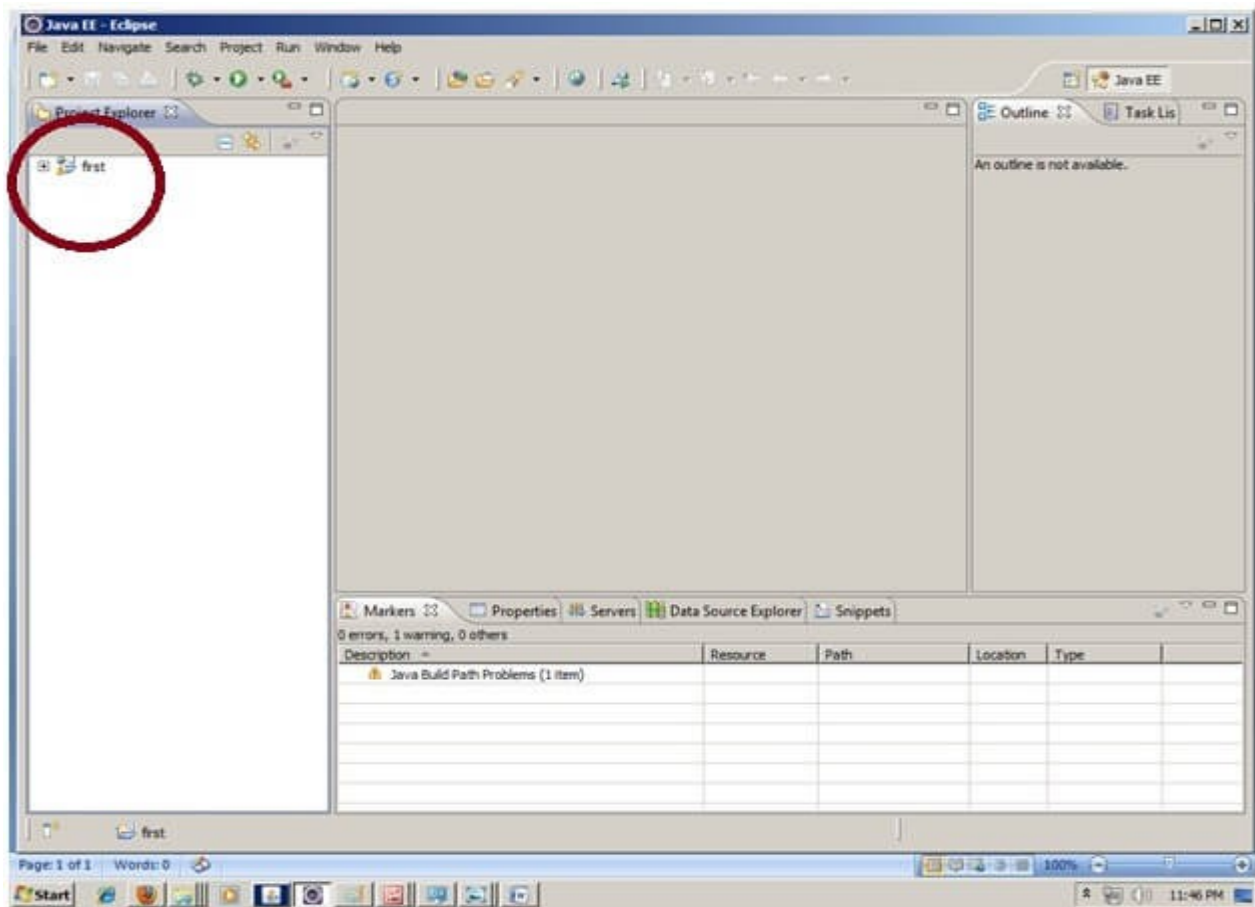






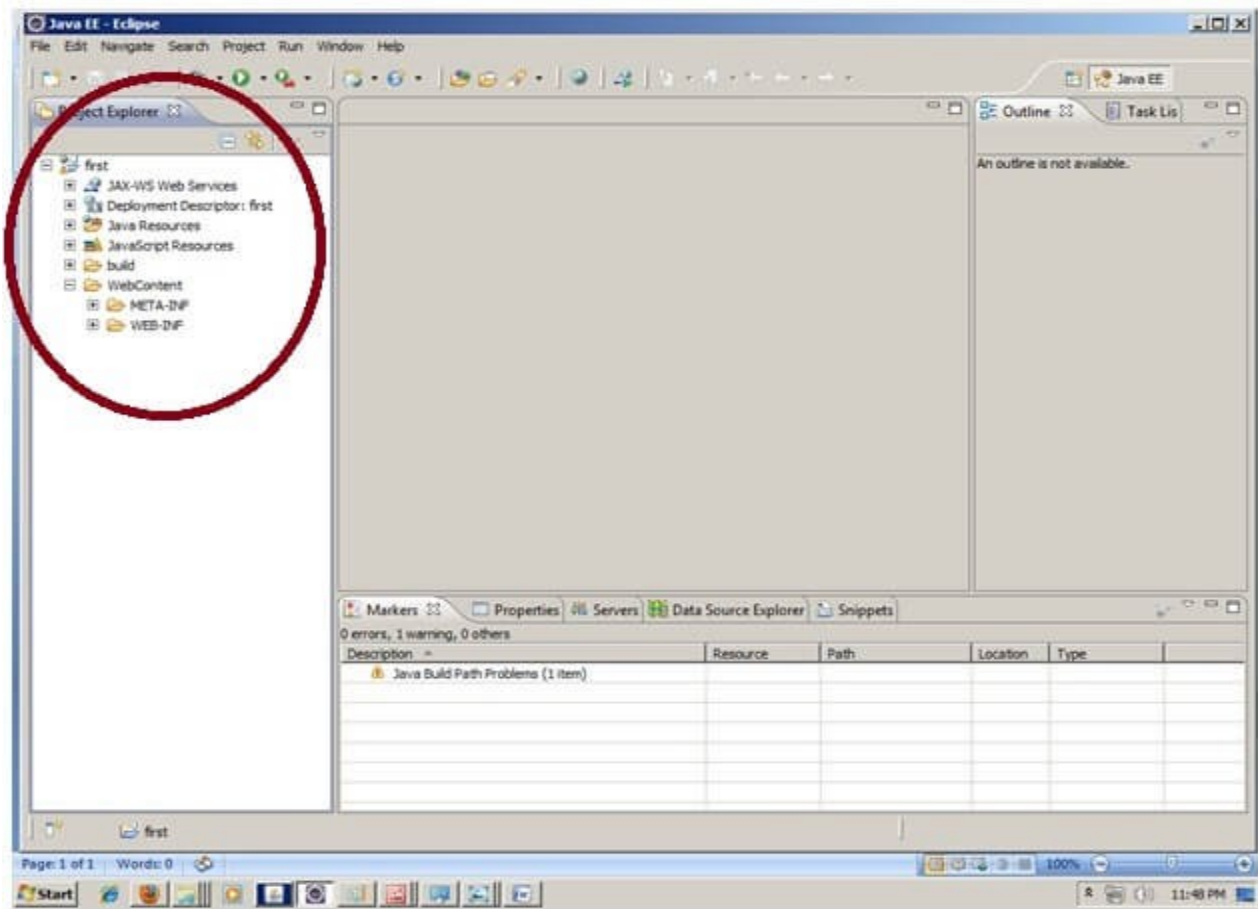






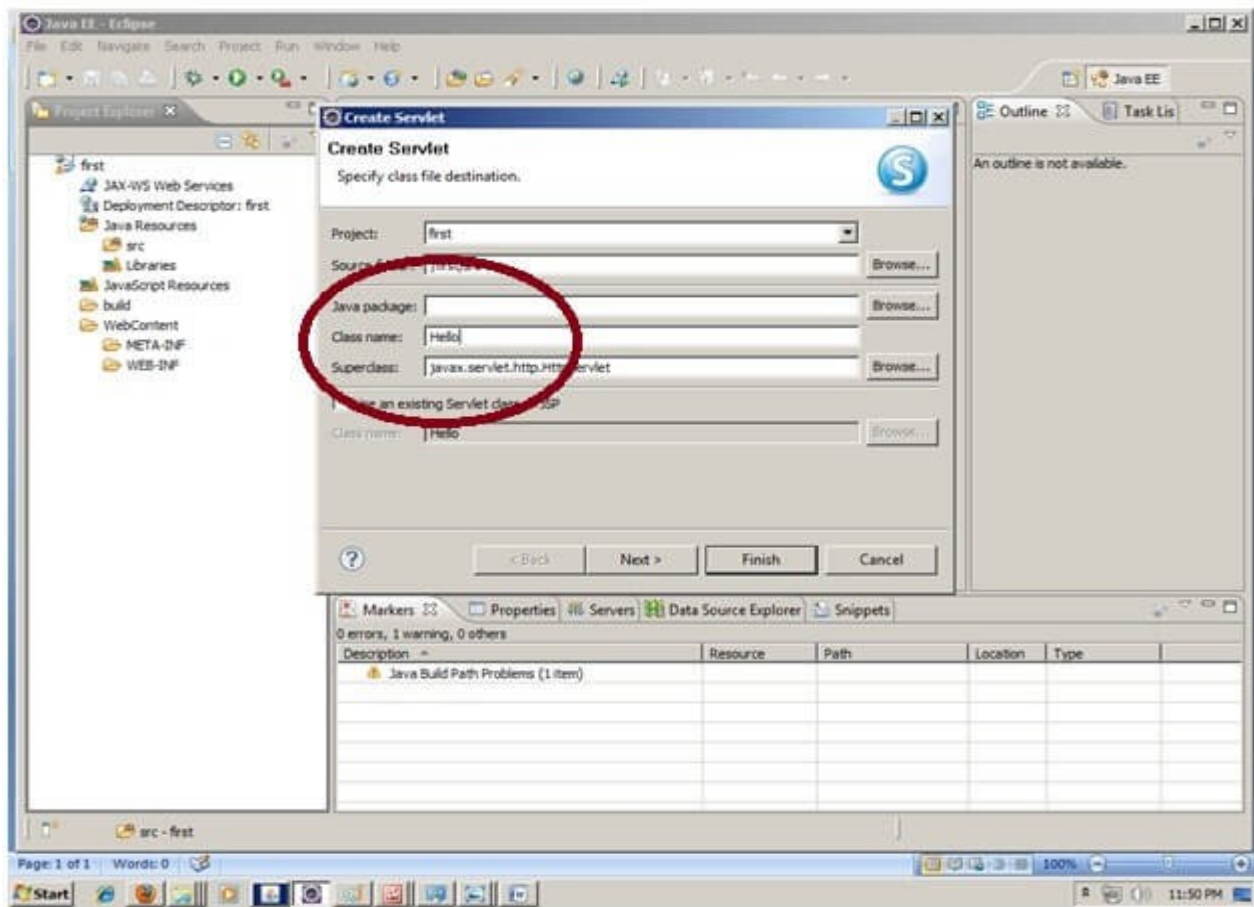
## 2) Create the servlet in eclipse IDE:

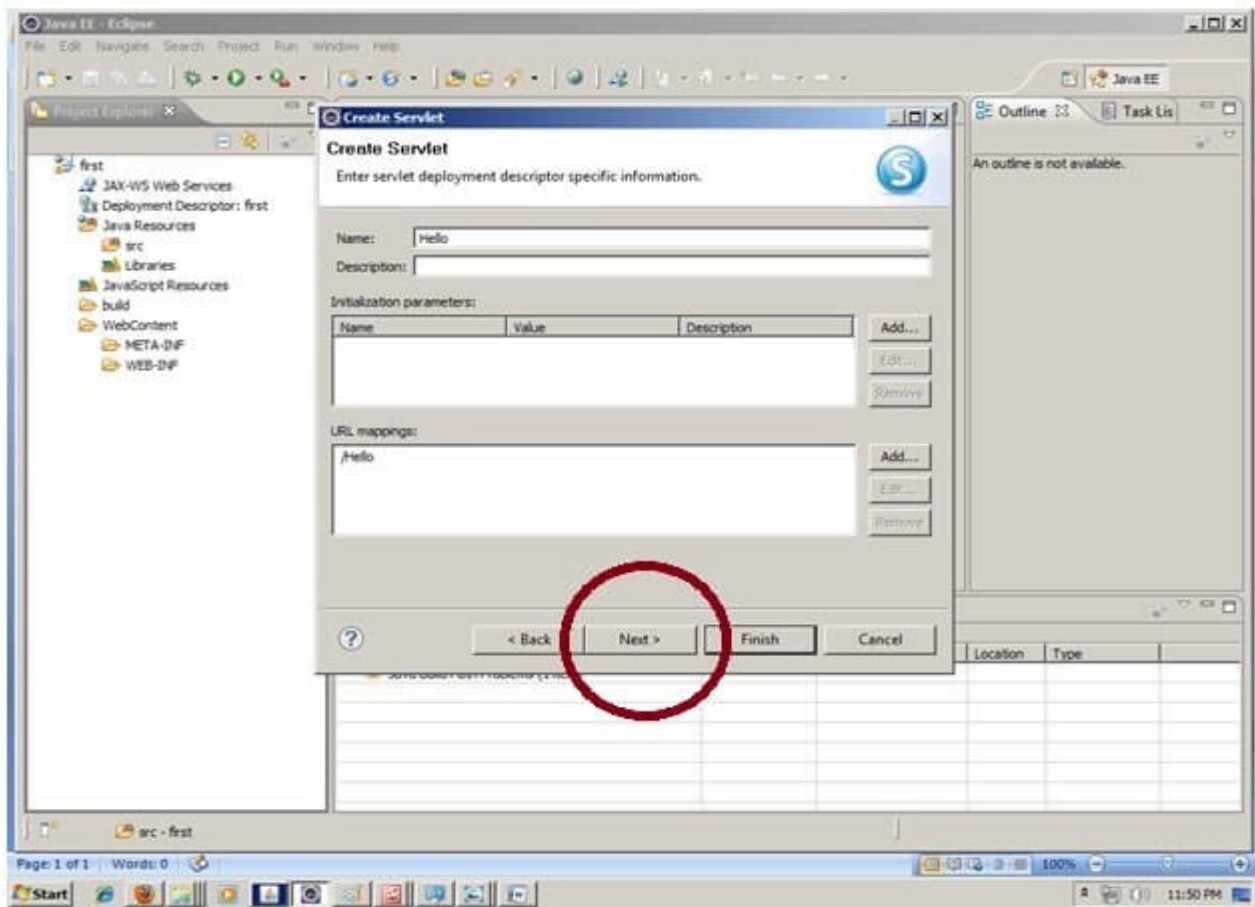
For creating a servlet, **explore the project by clicking the + icon -> explore the Java Resources -> right click on src -> New -> servlet -> write your servlet name e.g. Hello -> uncheck all the checkboxes except doGet() -> next -> Finish.**

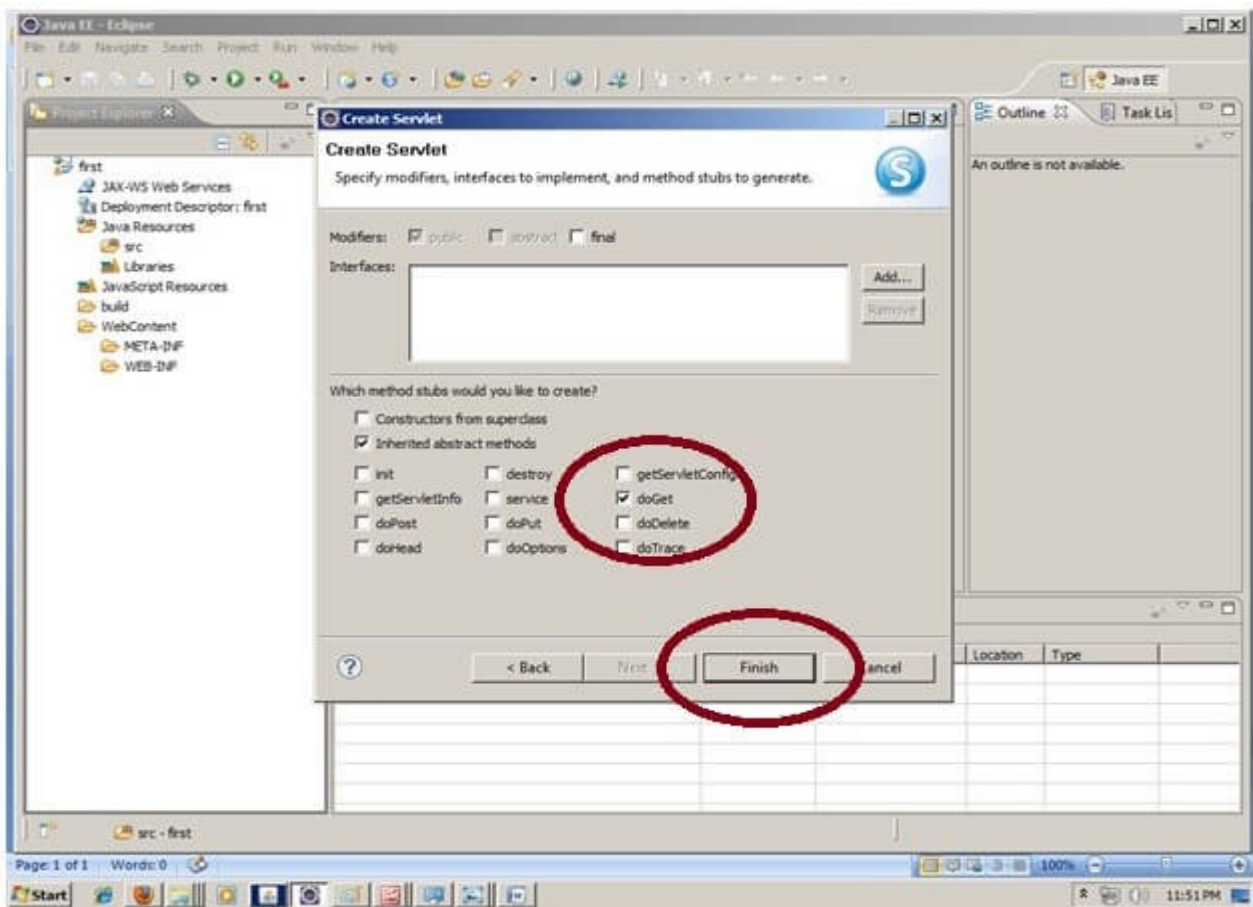


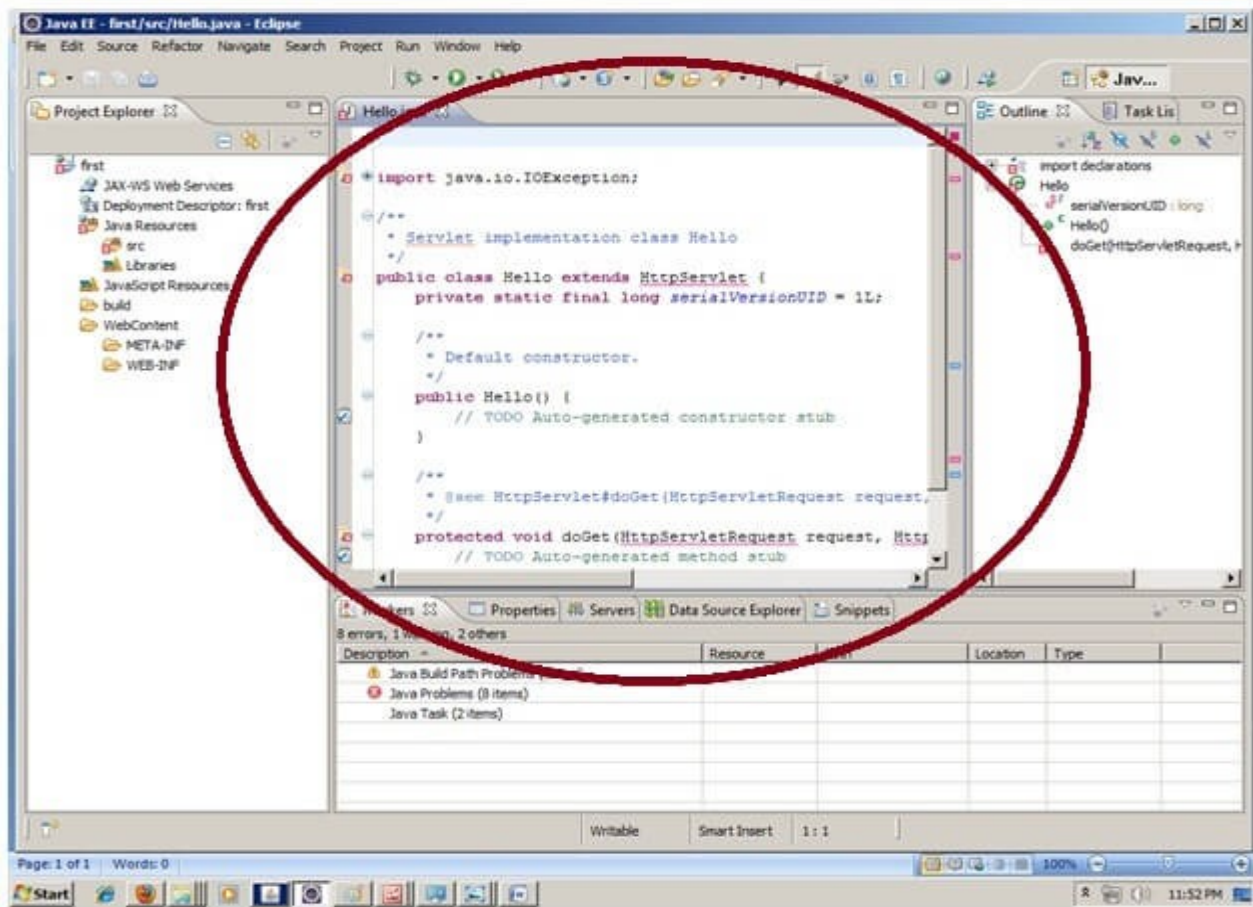






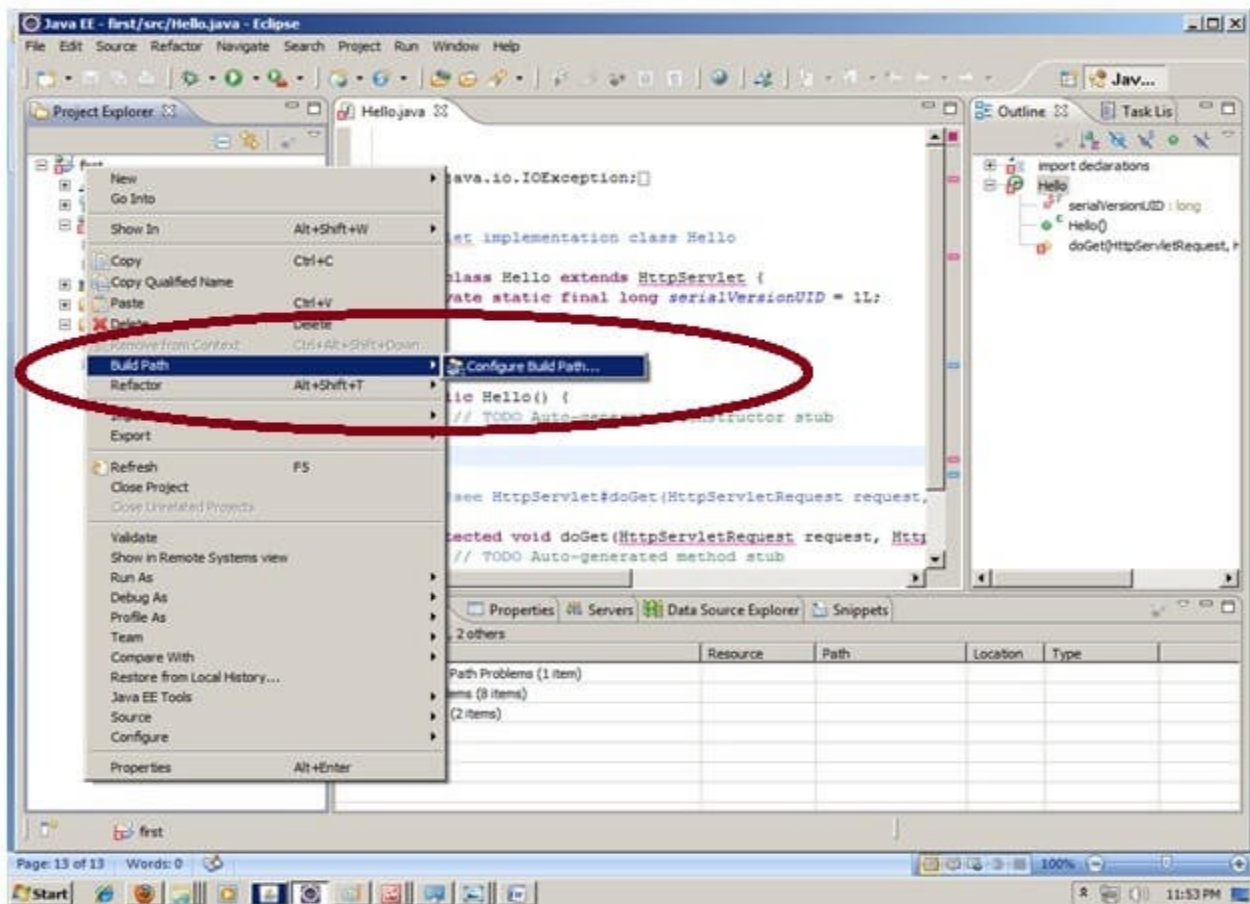




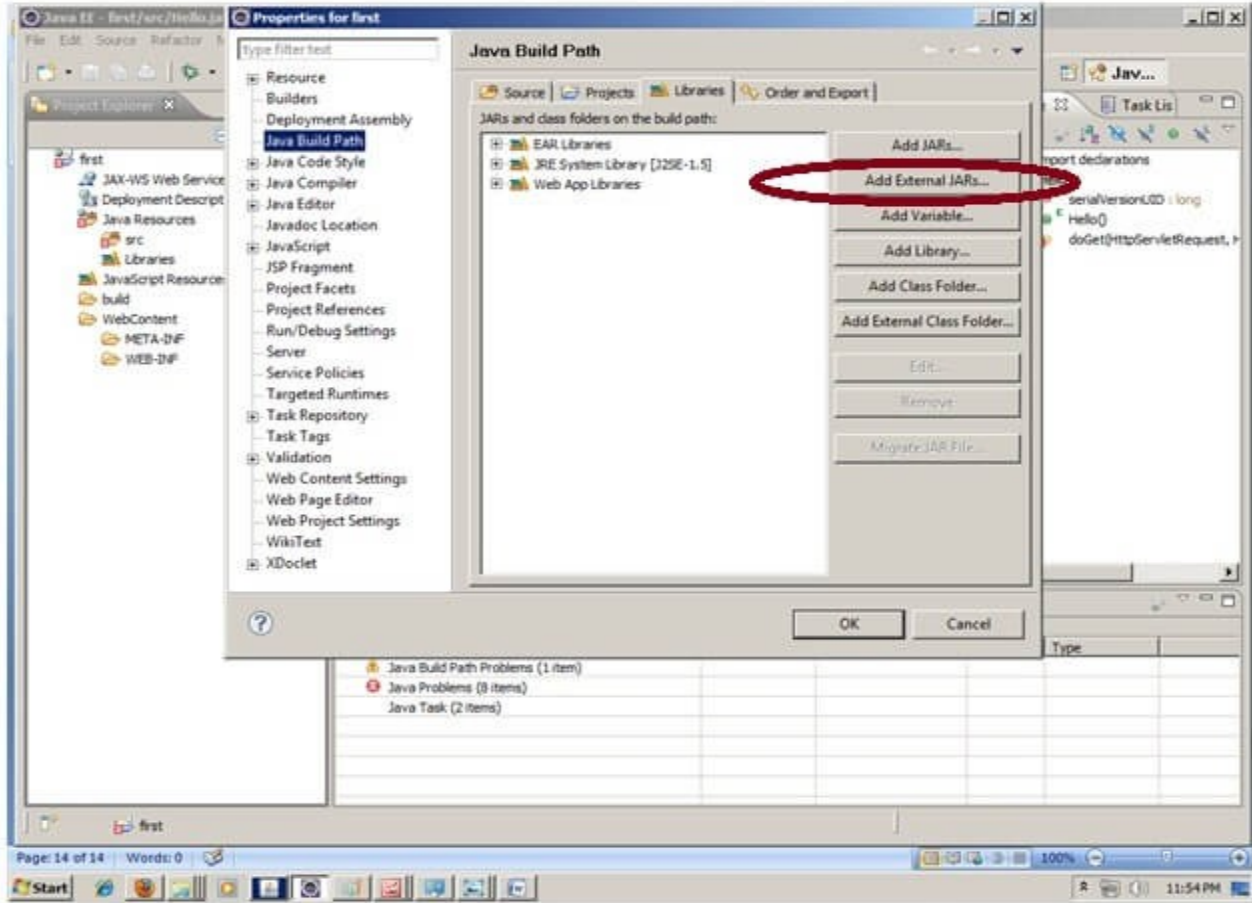


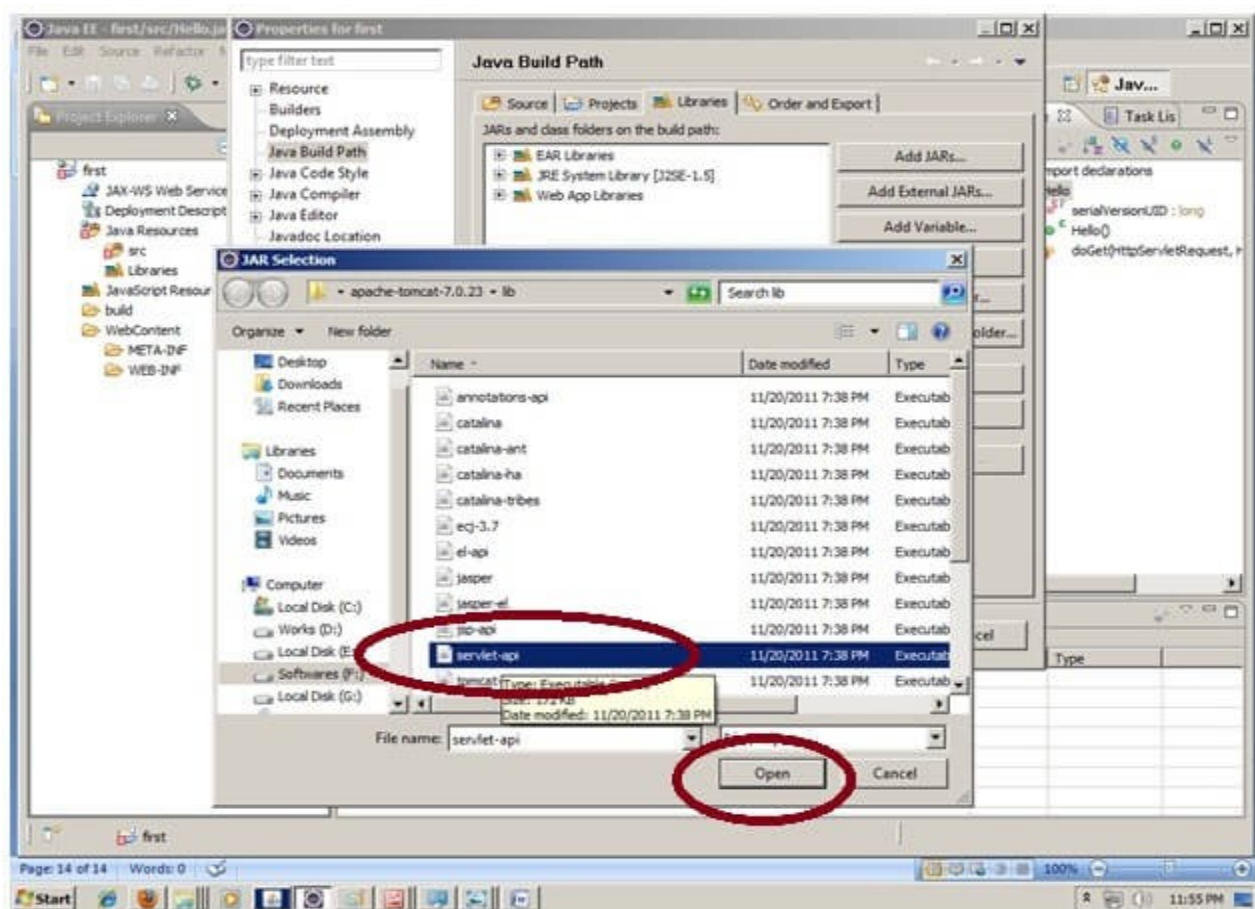
### 3) add jar file in eclipse IDE:

For adding a jar file, right click on your project -> Build Path -> Configure Build Path -> click on Libraries tab in Java Build Path -> click on Add External JARs button -> select the servlet-api.jar file under tomcat/lib -> ok.

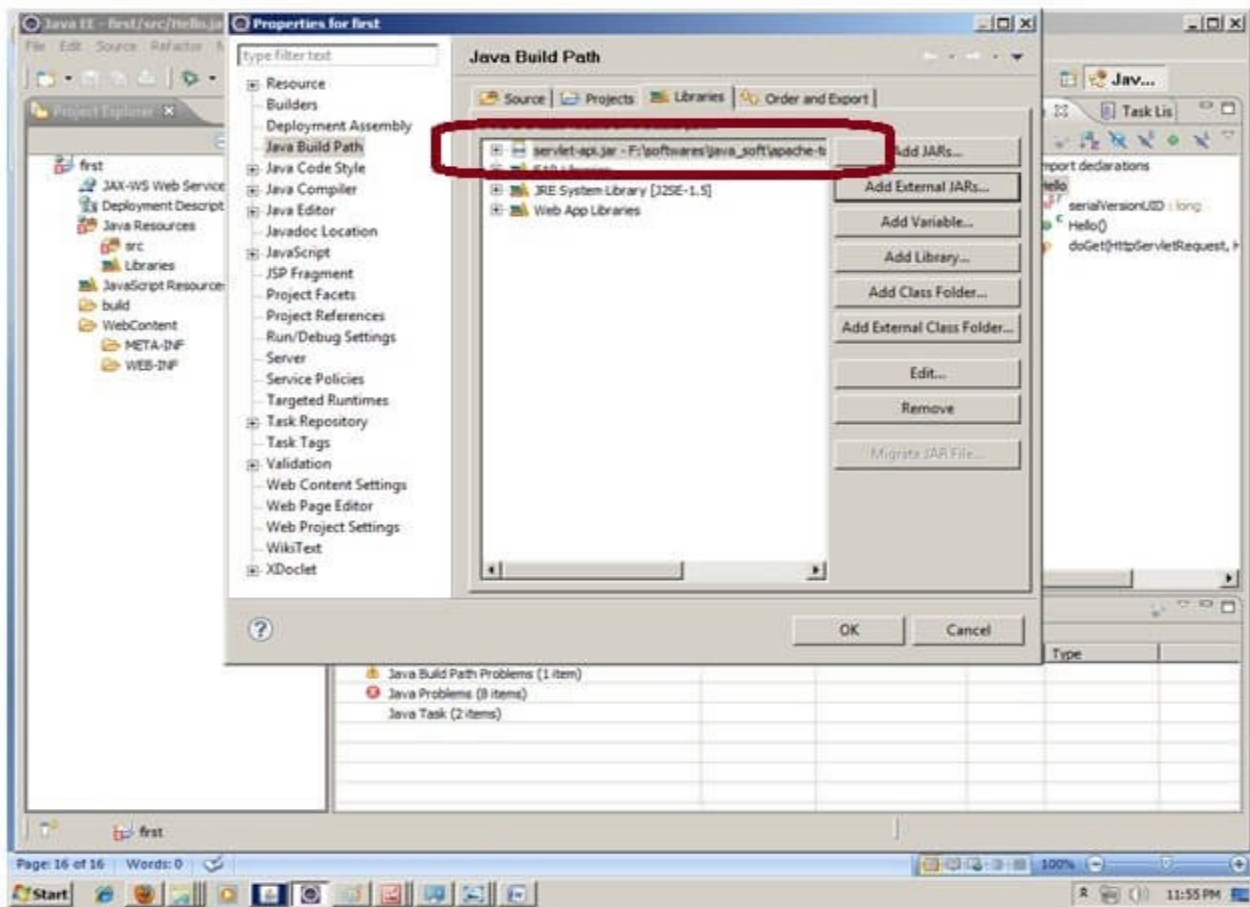


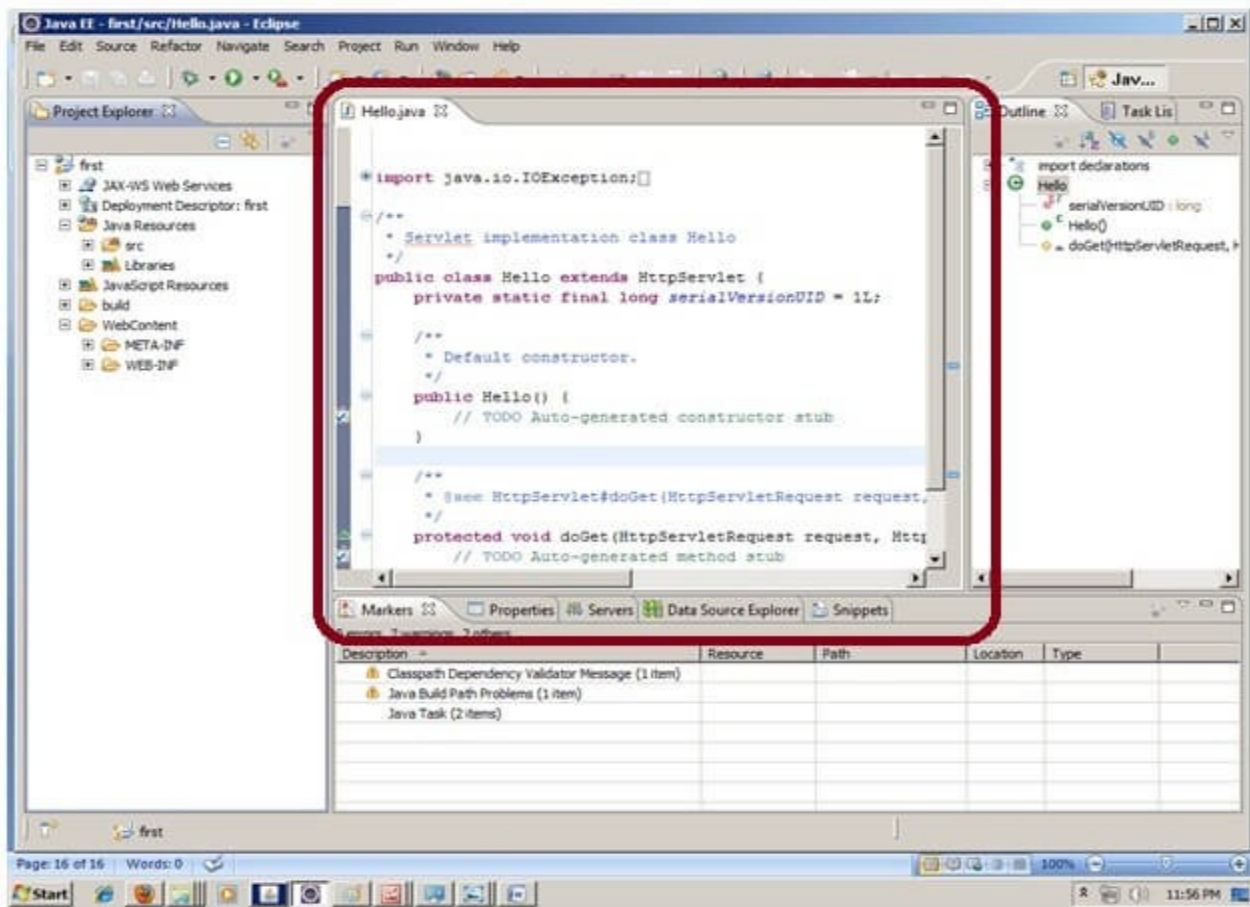




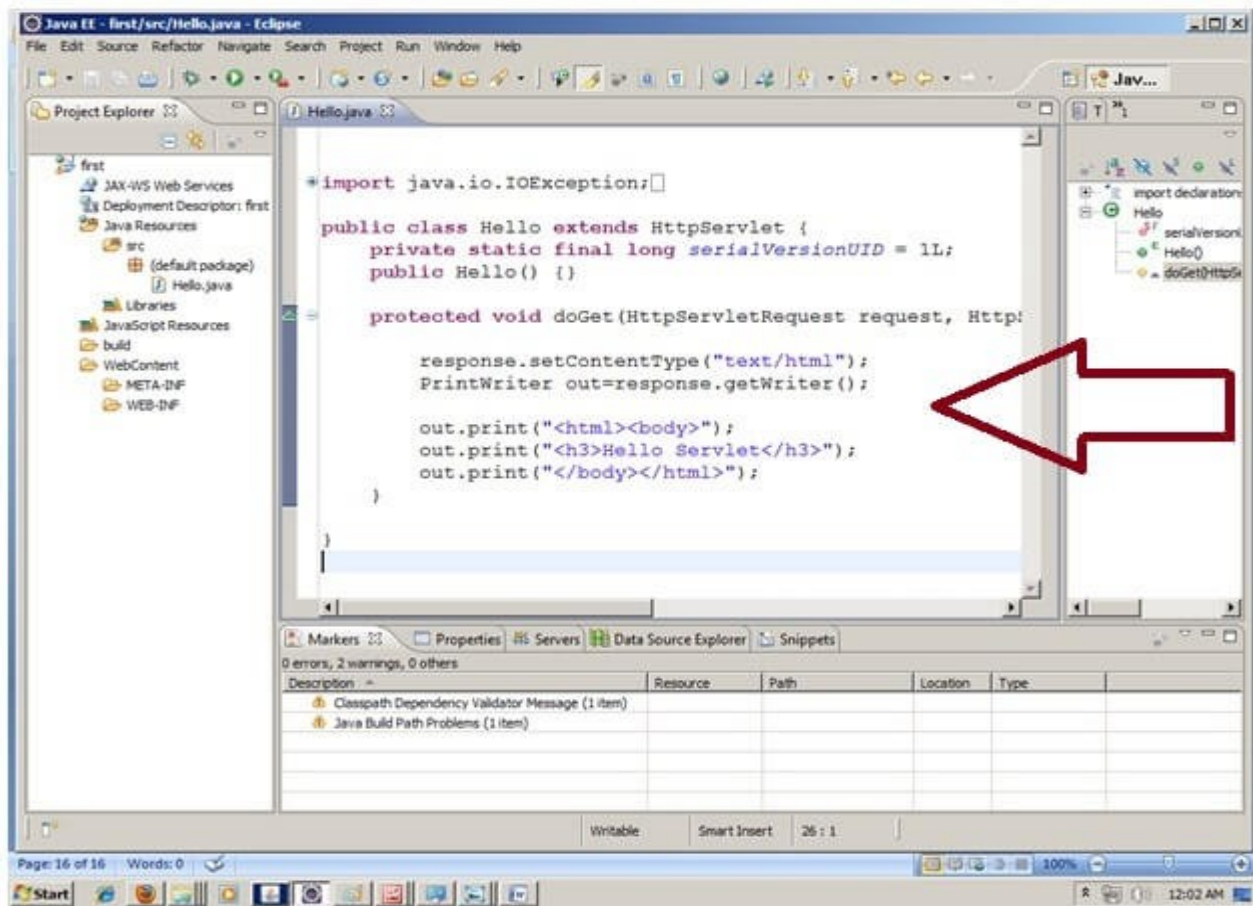






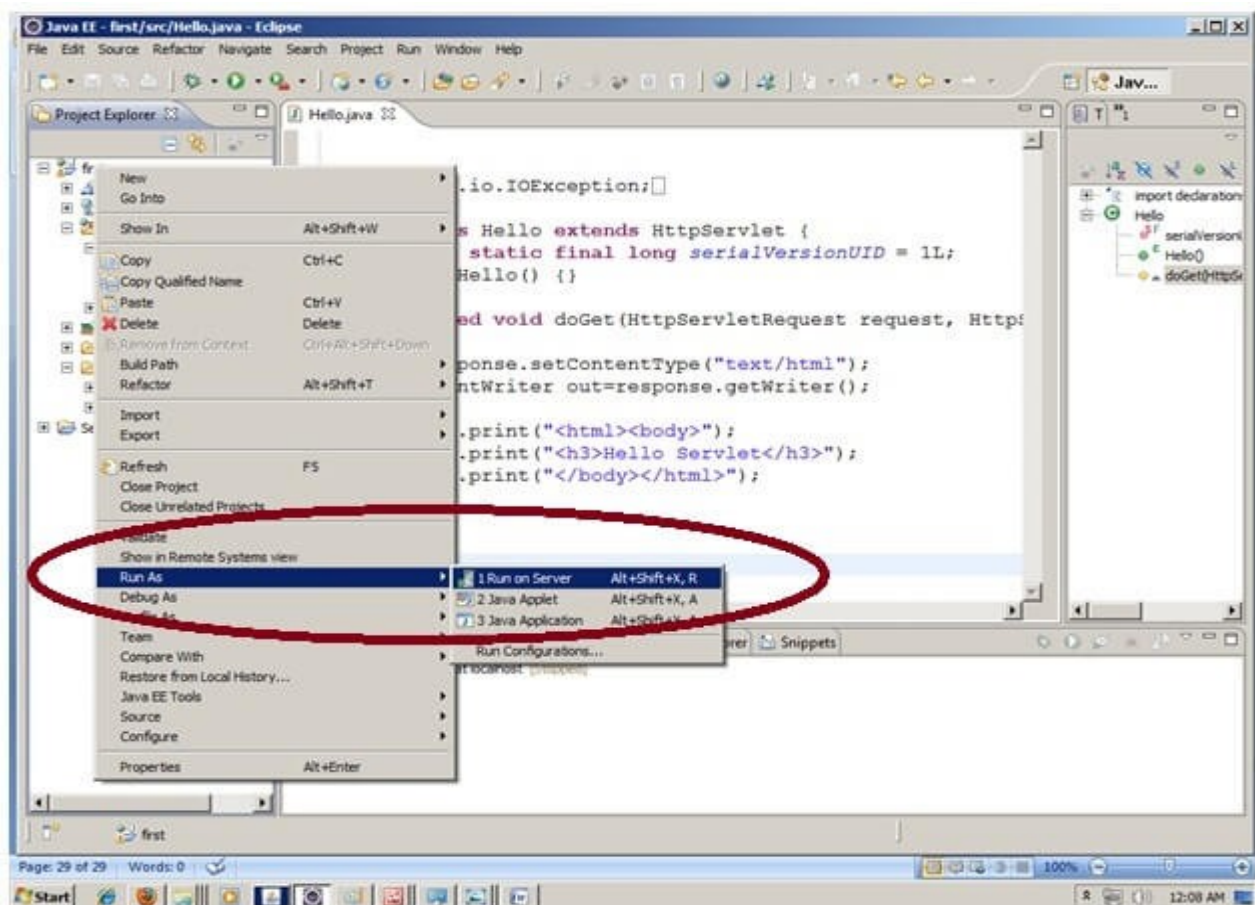


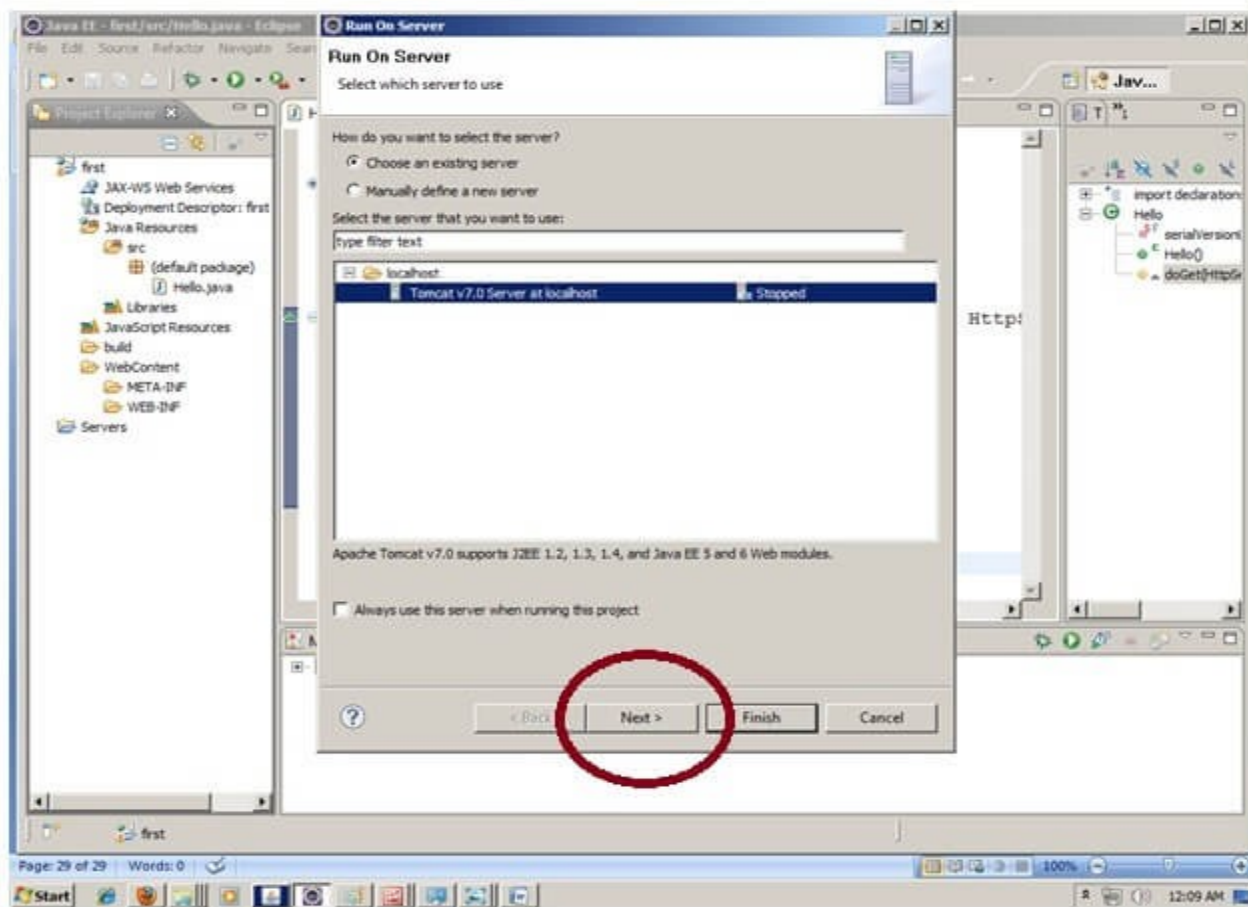
Now servlet has been created, Let's write the first servlet code.

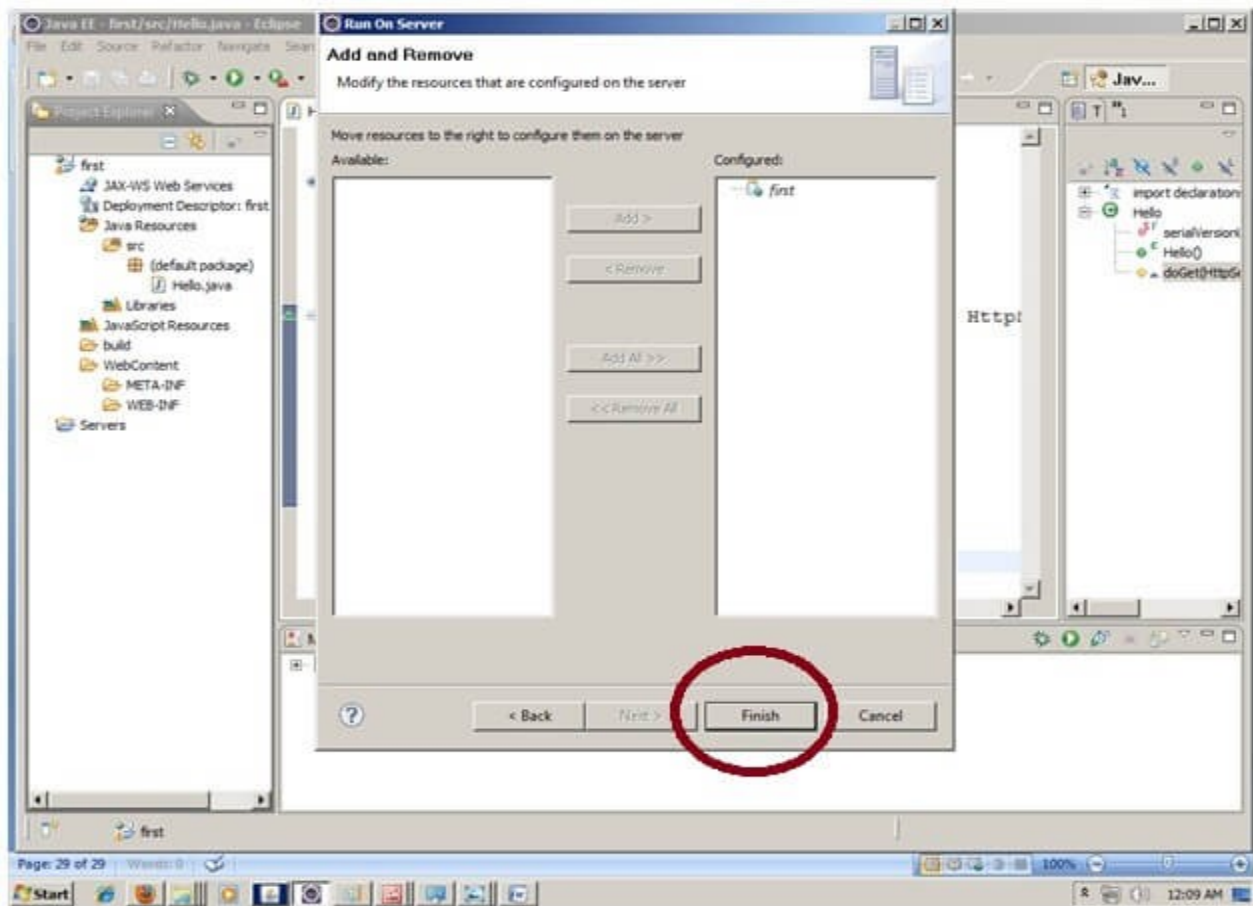


#### 4) Start the server and deploy the project:

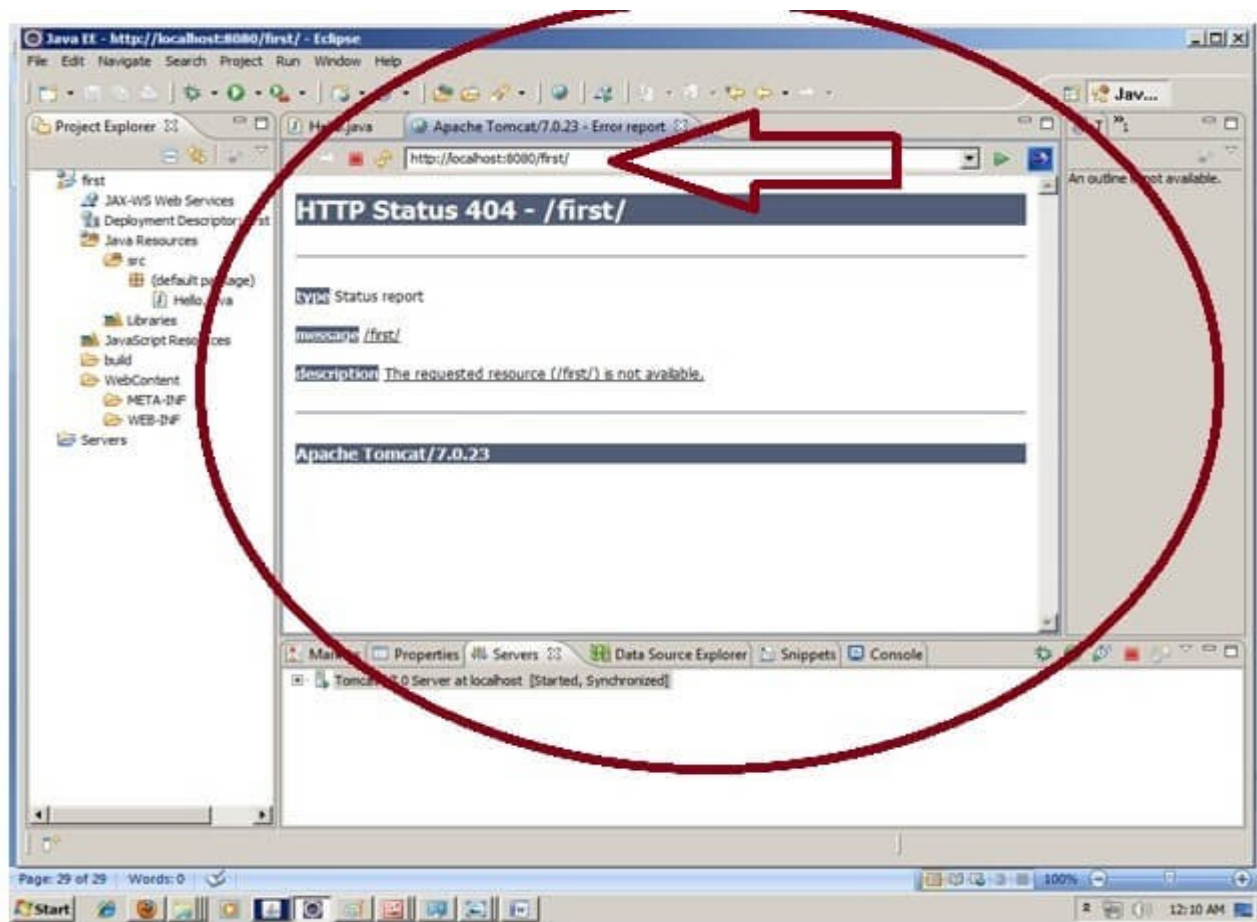
For starting the server and deploying the project in one step, **Right click on your project**  
-> **Run As** -> **Run on Server** -> **choose tomcat server** -> **next** -> **addAll** -> **finish**.



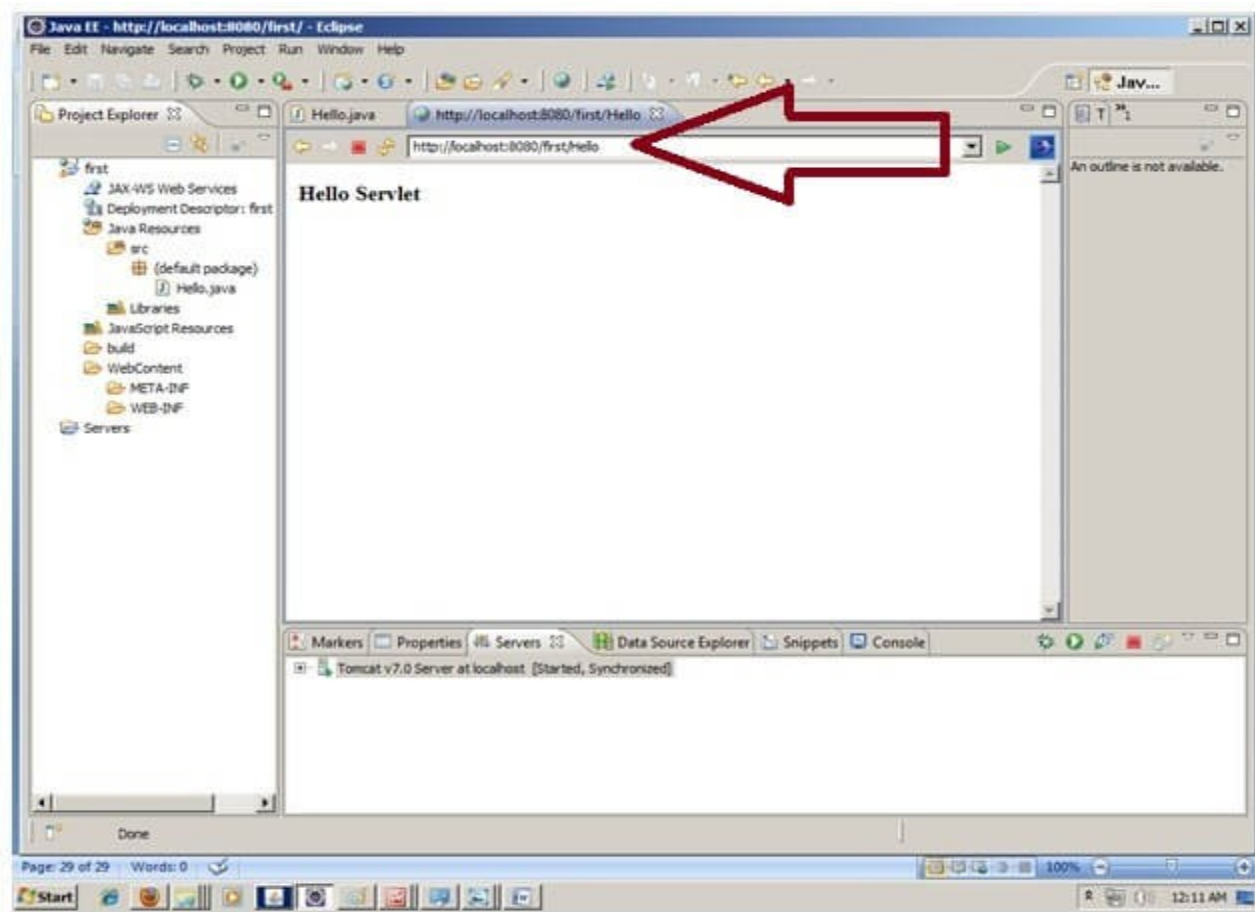








Now tomcat server has been started and project is deployed. To access the servlet write the url pattern name in the URL bar of the browser. In this case Hello then enter.



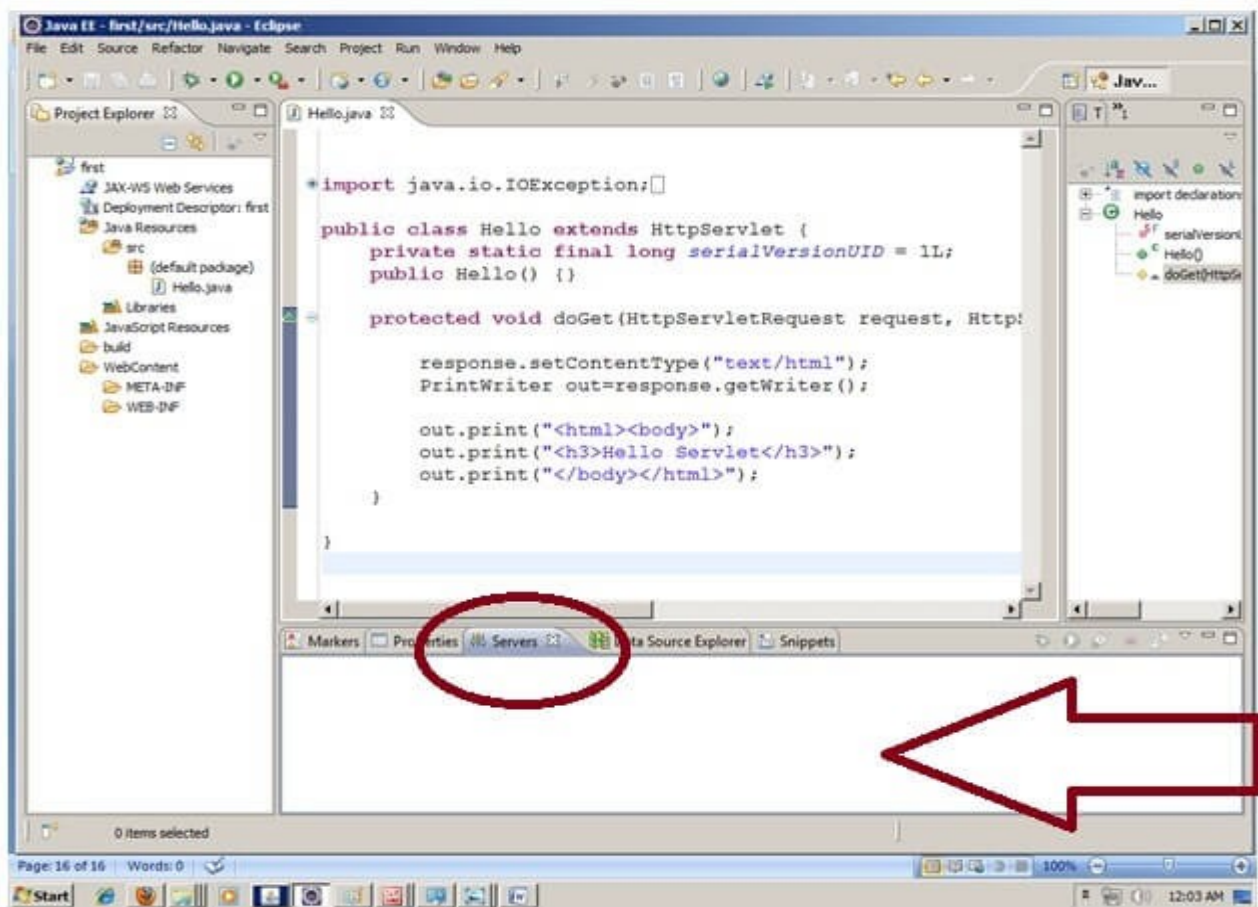
download this example

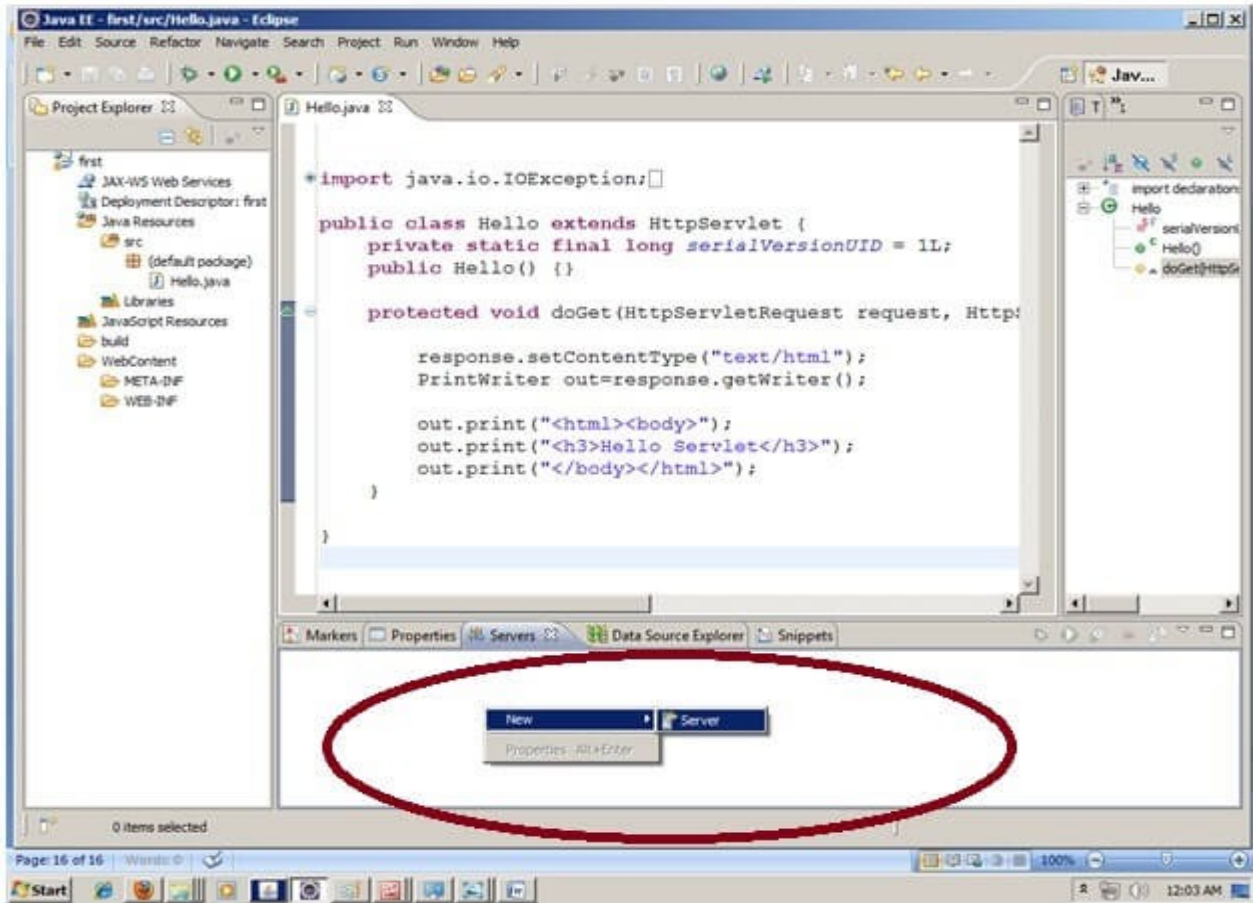
## How to configure tomcat server in Eclipse ? (One time Requirement)

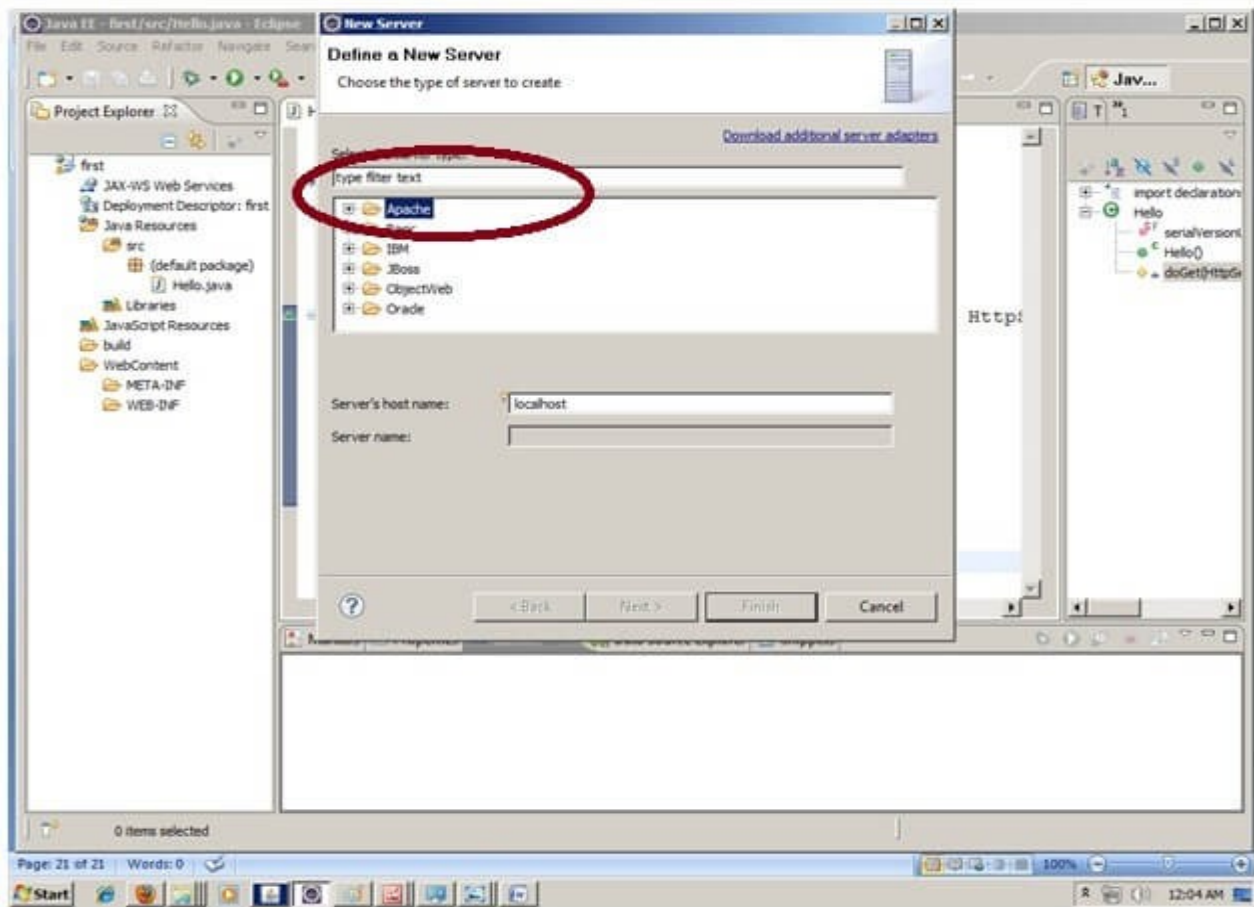
If you are using **Eclipse IDE first time**, you need to configure the tomcat server First.

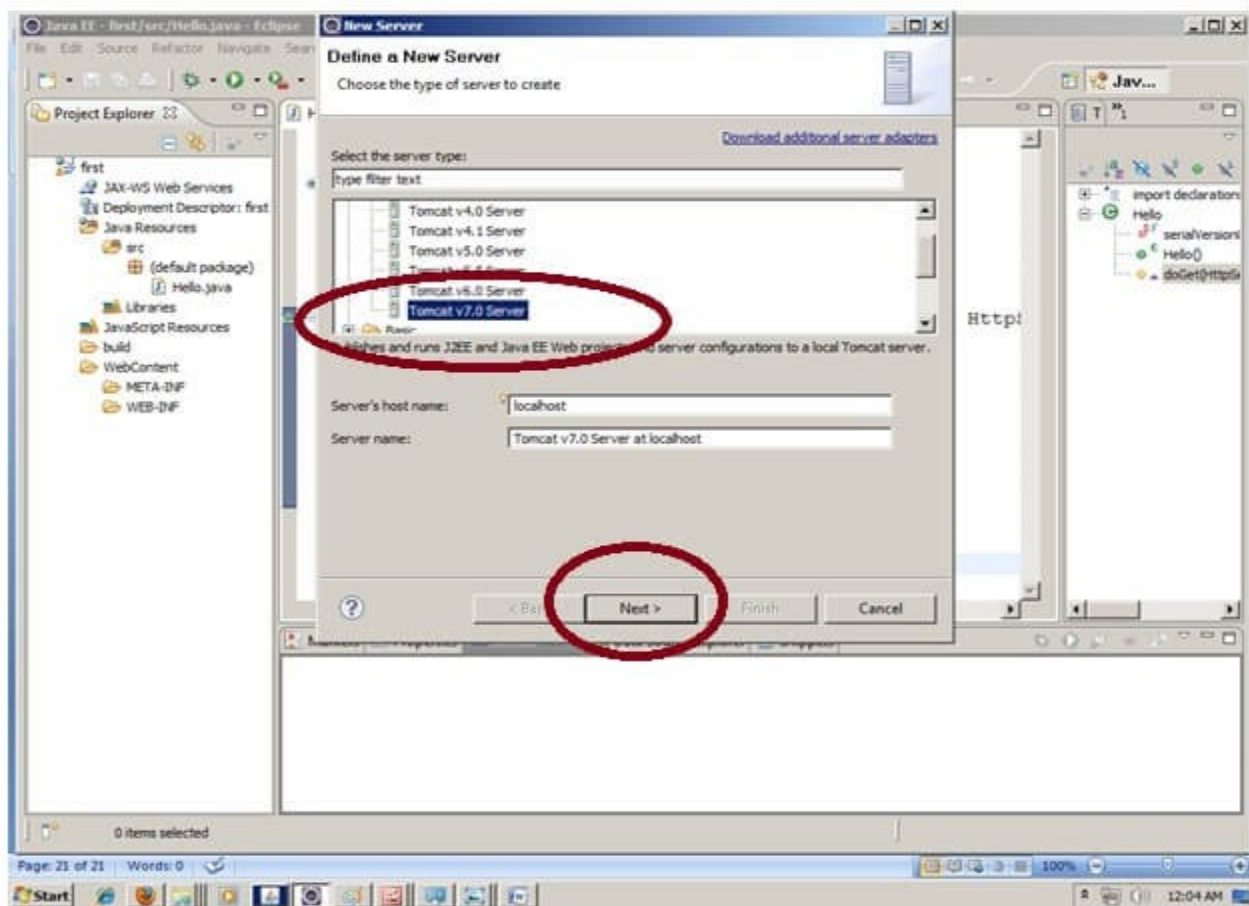
For configuring the tomcat server in eclipse IDE, **click on servers tab at the bottom side of the IDE -> right click on blank area -> New -> Servers -> choose tomcat then its version -> next -> click on Browse button -> select the apache tomcat root folder previous to bin -> next -> addAll -> Finish.**

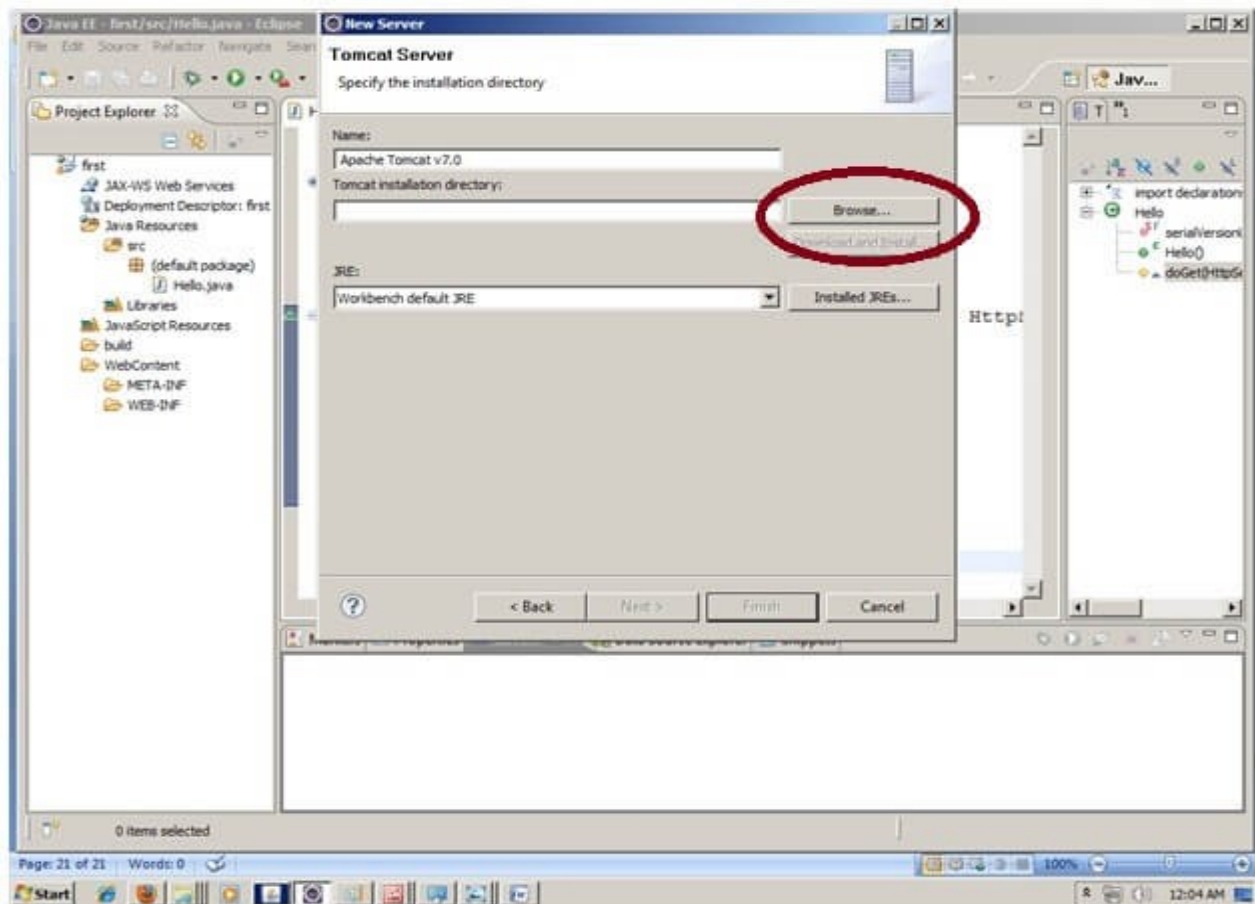


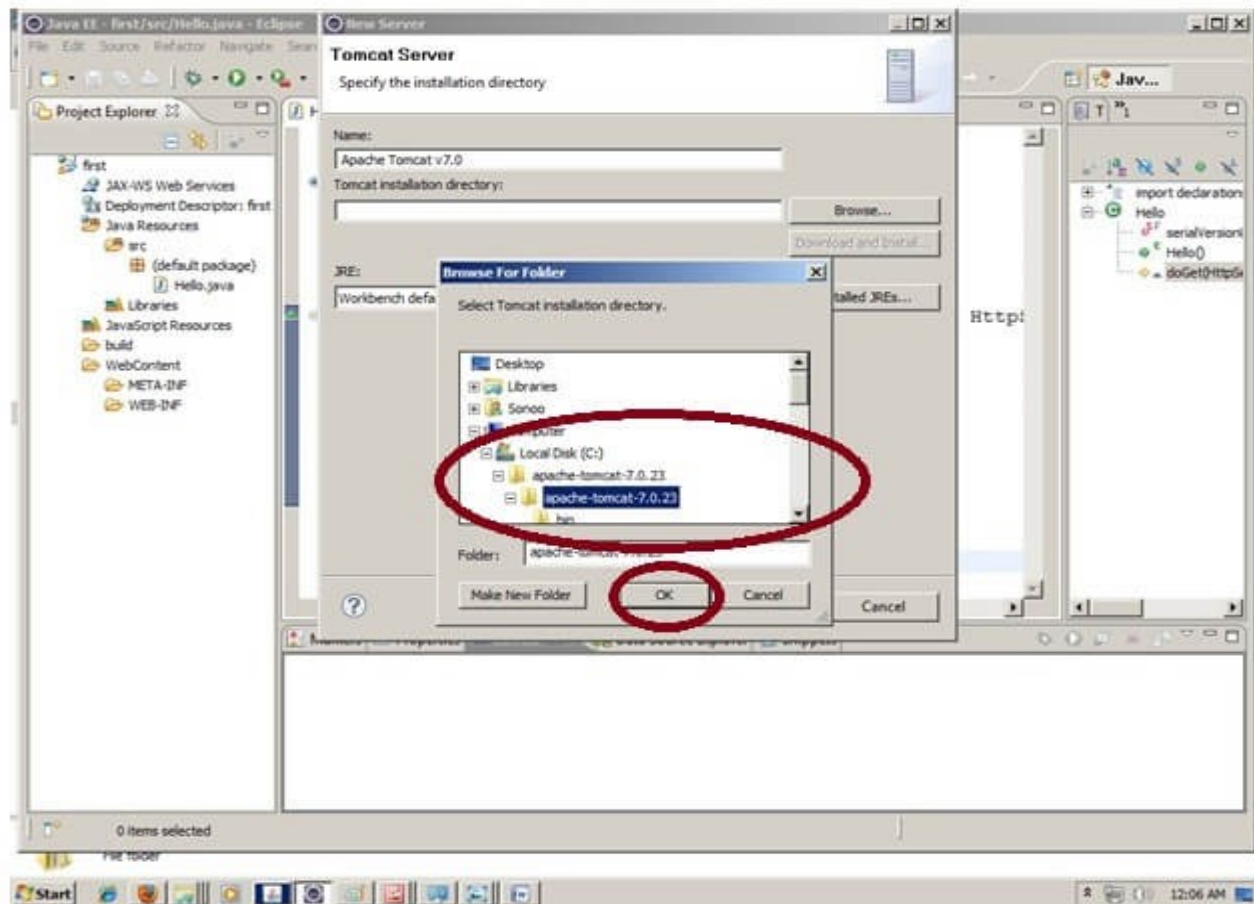


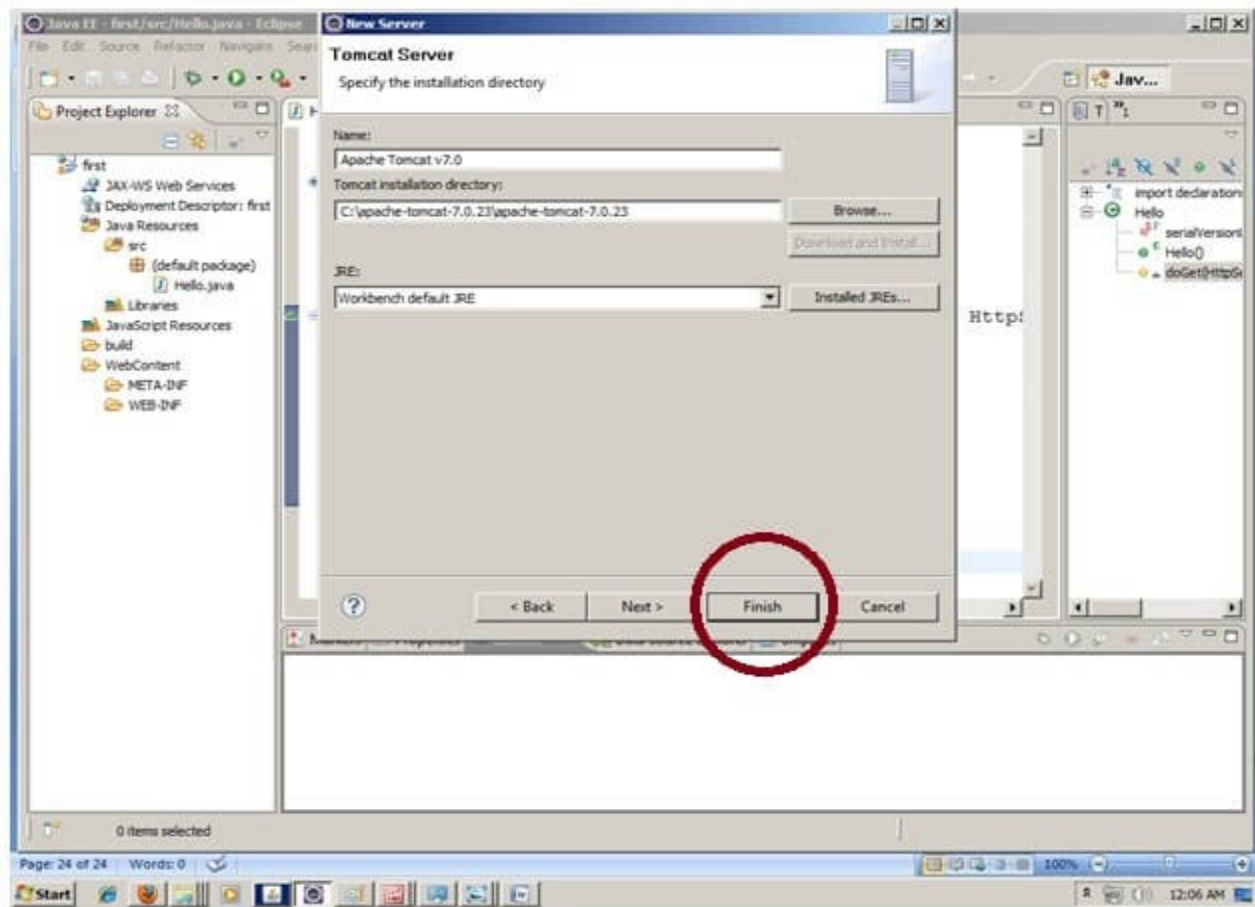






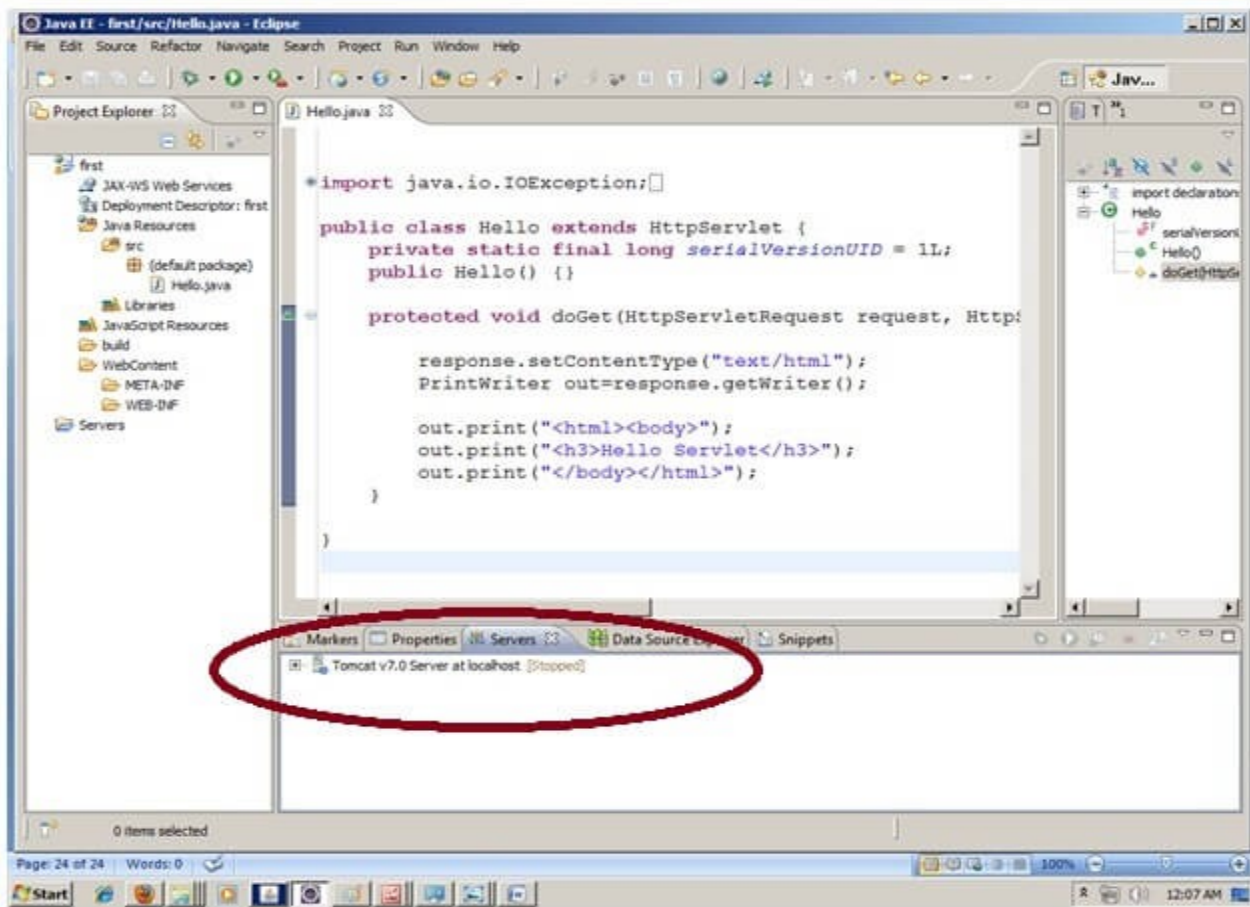






Now tomcat7 server has been configured in eclipse IDE.





<<prev next>>