IDE

- Web programming may be a little different from traditional programming, especially the debugging
  - Eclipse + Tomcat plugin
  - NetBean (bundled with Tomcat)
  - Tomcat log is very useful
- install it today and play with it
Servlet

what’s the difference between JSP and Servlet?
Multiplier example

- \tomcat\webapp\multiplier\WEB-INF\web.xml

```xml
<servlet>
  <servlet-name>multiplier</servlet-name>
  <servlet-class>MyMultiplier</servlet-class>
</servlet>

<servlet-mapping>
  <servlet-name>multiplier</servlet-name>
  <url-pattern>servlet/MyMultiplier</url-pattern>
</servlet-mapping>
```

- \tomcat\webapp\multiplier\multiplier.html

```html
<FORM METHOD="GET" ACTION="servlet/MyMultiplier">
  Provide the number to be multiplied:

  <INPUT TYPE="TEXT" NAME="num"/>
  
  <INPUT TYPE="SUBMIT" VALUE="Click Here to Submit"/>
</FORM>
```

accessing URLs calls the corresponding Servlets
public class MyMultiplier extends HttpServlet {

public void doGet(HttpServletRequest req, HttpServletResponse res)
    throws ServletException, IOException {

    res.setContentType("text/html");
    PrintWriter out = res.getWriter();
    out.println("<HTML><HEAD><TITLE>Multiply times " + 3 + "</TITLE></HEAD></HTML>");
    out.println("<BODY>");
    String parameter = req.getParameter("num");
    out.println(parameter + " * " + 3 + " = " +
            3 * (Integer.parseInt(parameter)));
    out.println("</BODY>");
    out.println("</HTML>"REFERRED TO AS an extension of HttpServlet

    }
}
Struts: a special Servlet

Struts:

```xml
<servlet>
  <servlet-name>action</servlet-name>
  <servlet-class>org.apache.struts.action.ActionServlet</servlet-class>
  <init-param>
    <param-name>/WEB-INF/struts-config.xml</param-name>
  </init-param>
  ...
</servlet>

<servlet-mapping>
  <servlet-name>action</servlet-name>
  <url-pattern>*.do</url-pattern>
</servlet-mapping>

<servlet>
  <servlet-name>multiplier</servlet-name>
  <servlet-class>MyMultiplier</servlet-class>
</servlet>

<servlet-mapping>
  <servlet-name>multiplier</servlet-name>
  <url-pattern>servlet/MyMultiplier</url-pattern>
</servlet-mapping>
```
Session & request

- session: calls from same browser process
- request: each HTTP call
- Usage of session & request
  - pass parameters/objects back and forth
    - e.g. retrieve data from database
- scope
request scope

- HTTP request by browser
  - Actual pages seen by users, not by developers
session can be more complicated than you think

think of an application of auction
- for each item, I can bid multiple times
- also, I can bid multiple items
- what is the scope of the session
  - biddings for a single item?
  - or across multiple items?