

JSPs

JSP/ASP/PHP Theory

CGI world

CGI - looks like code, possibly with some HTML thrown in

Servlet - same thing

Flexible but difficult (expensive)

JSP/ASP/PHP world

Have HTML, with little bits of "markup" thrown in to do a little database lookup or other small computation.

HTML is easier to deal with for most purposes.

No re-compile is required - edit the HTML and go

Works well if the problem is small - simpler than writing (and understanding) a CGI

Not appropriate for large computations.

Separate Computation and Presentation

1. Programming - "business logic"

Code, algorithms, database operations - things that look like code

2. HTML - "presentation"

HTML, images, tables - complex in its way, but it's not code

Result

Keep code and presentation separate

Servlets, CGI's, etc. for heavy computation

JSP etc. for presentation - JSPs etc. refer to servlet/CGI system for complex computations

Cheapness hypothesis

Perhaps this allows you to have just 2 coders and 10 HTML people - save money

It's not clear that this is true - the HTML people are also expensive.

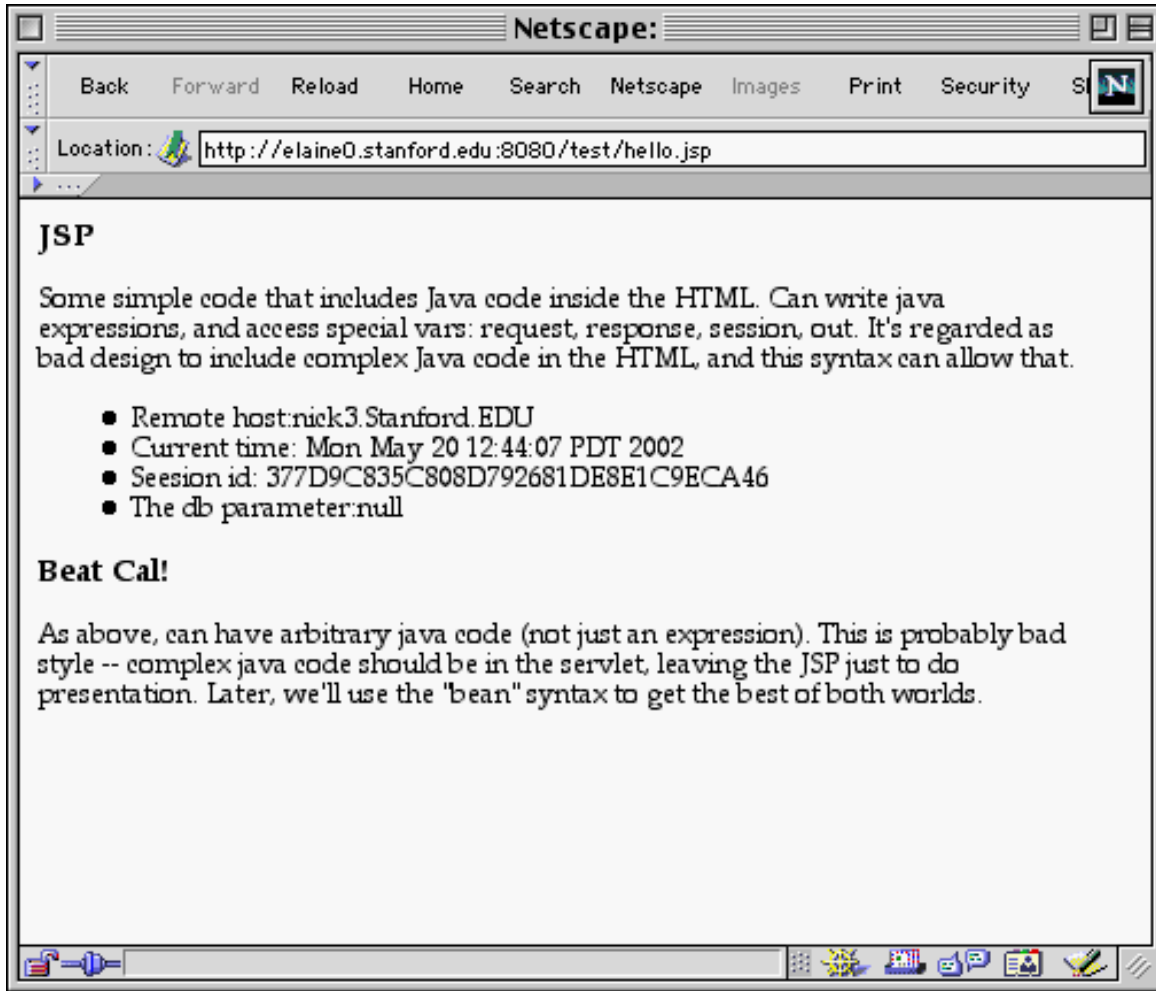
But perhaps it's still better to keep the two activities logically separate.

HTML markup technologies

ASP - Microsoft proprietary - looks like visual basic

PHP - open source - works well for connecting a web site to a database such as the open source MySQL

JSP - Java answer to ASP - uses Java/servlets for the back-end



JSP `<%= expr %>`

A little Java expression – output spliced into the HTML.
Keep the expression short. The heavy computation should be in the servlet.
Special vars: request, response, session

`request.getParameter("db")`

Pull a binding off the request
Returns "null" if the binding is not present

`request.getAttribute("foo")`

Pull an attribute off the request (set earlier with a call to `setAttribute()` in the servlet)

JSP `<% code %>`

Can write arbitrary code – use `out.print()` to output HTML
Probably bad style – mixing too much code into the presentation

HTML Code Creep / JSP Future

There's a fear that Java code will gradually creep into the HTML as workarounds for day-to-day site problems, messing up the separation.

That the `<% ... %>` sections will get longer and longer.
There are revisions in JSP 2.0 (and tomcat 5.x) that try to better tune the JSP syntax for common cases, and keep arbitrary java code out. We'll take a quick look at these later.

hello.jsp

```
<html>
<body bgcolor=white>
<!-- hello.jsp -->
<h3>JSP</h3>
```

`<p>`Some simple code that includes Java code inside the HTML. Can write java expressions, and access special vars: `request`, `response`, `session`, `out`. It's regarded as bad design to include complex Java code in the HTML, and this syntax can allow that.

```
<ul>
  <li>Remote host:<%= request.getRemoteHost() %>
  <li>Current time: <%= new java.util.Date() %>
  <li>Session id: <%= session.getId() %>
  <li>The db parameter:<%= request.getParameter("db") %>
<!-- this only works if there is a ?db=xxx binding on the request -->
</ul>
```

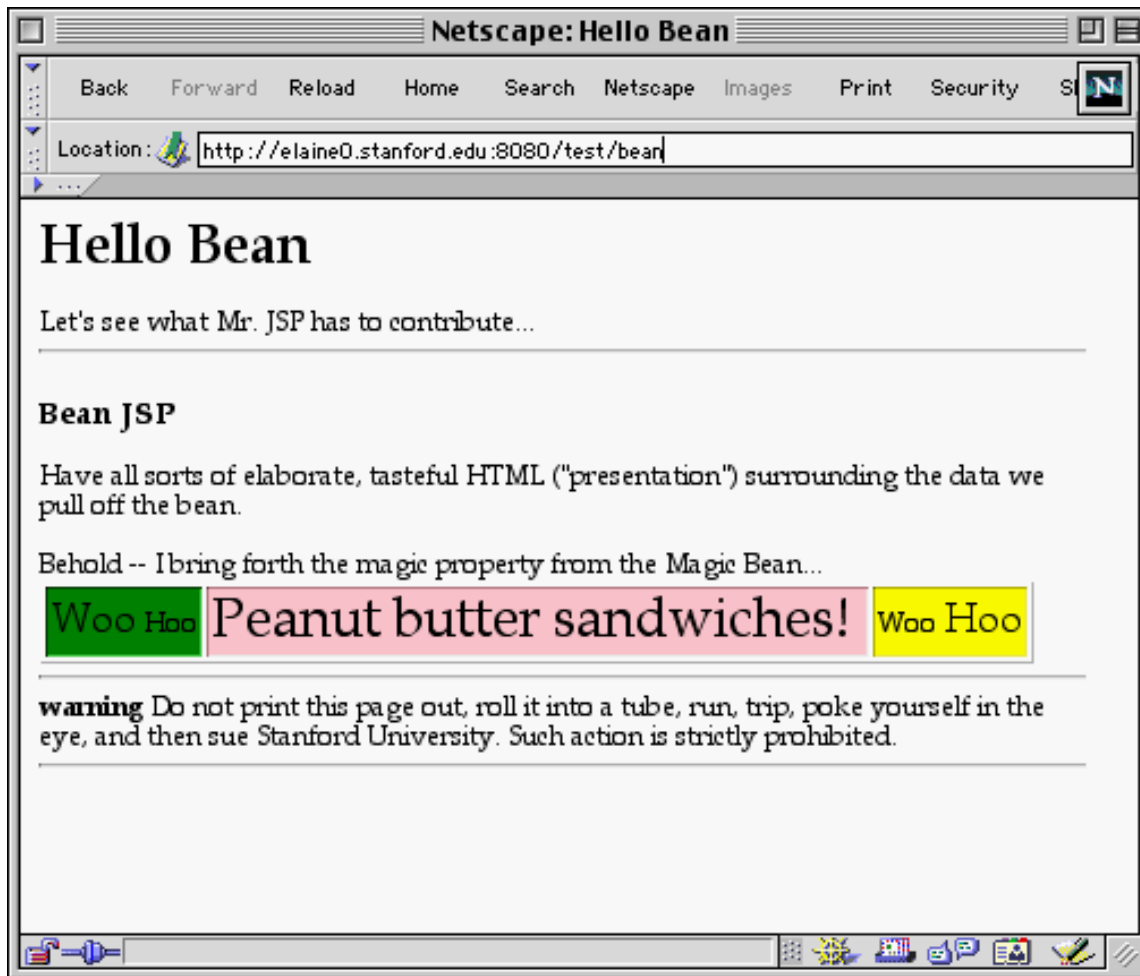
```
<%
    if (request.getRemoteHost().toLowerCase().indexOf("stanford")!=-1)
        out.println("<h3>Beat Cal!</h3>");
%>
```

`<p>`As above, can have arbitrary java code (not just an expression). This is probably bad style -- complex java code should be in the servlet, leaving the JSP just to do presentation. Later, we'll use the "bean" syntax to get the best of both worlds.

```
</body>
</html>
```

HelloBean

1. Put an attribute on the request for the JSP to see – a simple way to communicate to the JSP
`request.setAttribute("foo", "Binky");`
2. Put a bean on the request. The JSP can access the bean properties with the `useBean` tag below
`request.setAttribute("bean", bean);`
3. Use `rd.include` to paste in the output of `"/hello.jsp"`



HelloBean Code

```
// HelloBean.java
import java.io.*;
import java.util.*;
import javax.servlet.*;
import javax.servlet.http.*;

public class HelloBean extends HttpServlet
{
    public void doGet(HttpServletRequest request,
                      HttpServletResponse response)
```

```
    throws IOException, ServletException
    {
        response.setContentType("text/html");

        // Generate the HTML part of the response
        PrintWriter out = response.getWriter();

        out.println("<html>");
        out.println("<head>");

        String title = "Hello Bean";

        out.println("<title>" + title + "</title>");
        out.println("</head>");
        out.println("<body bgcolor=white>");

        out.println("<h1>" + title + "</h1>");

        out.println("<p>Let's see what Mr. JSP has to contribute...");

        // 0. There may already be form bindings on our request --
        // the JSP can access those with request.getParameter("name")

        // 1. Put an arbitrary binding on the request for the JSP
        // to see -- JSP accesses with getAttribute()
        request.setAttribute("foo", "Binky");

        // 2. Put a bean on the request for the JSP to see
        MagicBean bean = new MagicBean("Peanut butter sandwiches!");
        request.setAttribute("bean", bean);

        // 3. Paste in the output of the JSP
        RequestDispatcher rd = getServletContext().getRequestDispatcher("/bean.jsp");
        rd.include(request, response);

        out.println("<hr>");
        out.println("</body>");
        out.println("</html>");
    }

    // Override doPost() -- just have it call doGet()
    public void doPost(HttpServletRequest request,
                       HttpServletResponse response)
        throws IOException, ServletException
    {
        doGet(request, response);
    }
}
```

JavaBean

Simple object that collects some named properties – exposes the properties to client code through get/set messages.

Has a no-argument constructor

The properties are accessible with get/set messages

For a “foo” property, responds to getFoo(), setFoo()

MagicBean

```
// MagicBean.java
/*
 * A simple bean that contains a single "magic" string.
 */
public class MagicBean {
    private String magic;

    public MagicBean(String string) {
        magic = string;
    }

    public MagicBean() {
        magic = "Woo Hoo";// default magic string
    }

    public String getMagic() {
        return(magic);
    }

    public void setMagic(String magic) {
        this.magic = magic;
    }
}
```

Improved: useBean

Set up the bean in servlet Java code

There's a fairly simple syntax for the JSP to read values out of the bean

jsp:usebean

```
<jsp:usebean id="bean" class="MagicBean" />
```

Pull in the bean, prep for getProperty

```
<jsp:getProperty name="bean" property="magic" />
```

Pull the given property out of the given bean

This maps to bean.getMagic()

JSP 2.0 improves the syntax for the "pull value from bean case"

jsp:include

Use to splice in content from another page

bean.jsp

```
<!-- bean.jsp -->
<hr>

<h3>Bean JSP</h3>

<p>Have all sorts of elaborate, tasteful HTML ("presentation")
surrounding the data we pull off the bean.

<p>
Behold -- I bring forth the magic property from the Magic Bean...

<!-- bring in the bean under the name "bean" -->
<jsp:usebean id="bean" class="MagicBean" />

<table border=1>
<tr>
<td bgcolor=green><font size=+2>Woo</font> Hoo</td>

<td bgcolor=pink>
<font size=+3>
  <!-- the following effectively does bean.getMagic() -->
  <jsp:getProperty name="bean" property="magic" />
</font>
</td>

<td bgcolor=yellow>Woo <font size=+2>Hoo</font></td>

</tr>
</table>

<!-- pull in content from another page at request time
with a relative URL ref to another page -->
<jsp:include page="trailer.html" flush="true" />
```