What is EL?

- Expression Language (EL)
  - Since the JSP 2.0 Specification
  - A more concise way to access bean properties and write JSP expressions
    - vs. `<jsp:getProperty>`
    - vs. `<%= expression %>`
  - Java's answer to scripting languages
- Syntax: `${ expression }`

Example: BGColor.jsp Revisited

- Use EL to access the bean properties
  - `${ bean_name.property_name }`

More Property Access Examples

- Bean BeanA
  - int property id
  - String property name
  - String[] property weekdays
  - List<Integer> property numbers
- Bean BeanB
  - BeanA property bean0
  - List<BeanA> property beans

Expression

- Literals
- Operators
- Variables

EL Literals

- `true`, `false`
- `23`, `0x10`, ...
- `7.5`, `1.1e13`, ...
- "double-quoted", 'single-quoted'
- `null`
- No char type
EL Operators

- Arithmetic
  +, -, *, /, %
  div, mod
- Logical
  &&, ||, !
  and, or, not
- Relational
  =, !=, <, >, <=, >=
  eq, ne, lt, gt, le, ge

- Conditional
  ?:
  empty
  check whether a value is null or empty

- Other
  [ ], \{

EL Evaluation and Auto Type Conversion

<table>
<thead>
<tr>
<th>Expression</th>
<th>Evaluation</th>
</tr>
</thead>
<tbody>
<tr>
<td>${2+4/2}</td>
<td>$(empty &quot;&quot;)</td>
</tr>
<tr>
<td>${2+3/2}</td>
<td>$(empty null)</td>
</tr>
<tr>
<td>${&quot;2*3/2}</td>
<td>$(empty &quot;null&quot;)</td>
</tr>
<tr>
<td>${&quot;a&quot; + 3 div 2}</td>
<td>$(&quot;abc&quot; lt &quot;b&quot;)</td>
</tr>
<tr>
<td>${null == 'test'}</td>
<td>$(&quot;cs320&quot; &gt; &quot;cs203&quot;)</td>
</tr>
<tr>
<td>${null eq 'null'}</td>
<td></td>
</tr>
</tbody>
</table>

EL Variables

- You cannot declare new variables using EL (after all, it’s called “expression” language).
- However, you can access beans, implicit objects, and previously defined scoped variables (i.e. the objects saved in application/session/request/page scopes by `setAttribute()`) y

Implicit Objects in EL

- `pageContext`
  - `setAttribute`
  - `getAttribute`
- `requestScope`
- `sessionScope`
- `applicationScope`
- `param`, `paramValues`
- `header`, `headerValues`
- `cookie`
- `initParam`

Example: RequestInfo.jsp

- Display some information about the request
  - Client address ...
  - Cookies and parameters
- Use of implicit objects
  - Find the Java class type for the object
    - Look for `getters` in the API
      - E.g. `pageContext.request.remoteAddr`
    - Access elements in a collection
      - `cookie` and `param`?

Limitation of EL

- Only expressions, no statements,
  especially no control-flow statements