"The Future of Software Bugs"

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The continuing threat of software bugs stems from a variety of factors, including software vendors and in-house development teams that rush testing and sacrifice quality so they can rapidly move products to market; academic computer science programs that place more emphasis on development than testing; and legislation that absolves developers of the blame for damages users suffer as a result of faulty products.
Web Server Example

Connecting:

Server: \((\text{define } l (\text{tcp-listen } 4000))\)
Client: \((\text{tcp-connect "127.0.0.1" 4000})\)
\[\rightarrow \#<\text{input-port}> \#<\text{output-port}>\]

Server: \((\text{tcp-accept } l)\)
\[\rightarrow \#<\text{input-port}> \#<\text{output-port}>\]
Examples in DrScheme...
Web Page Encoding

A web page is more than plain characters:

<table>
<thead>
<tr>
<th>Date</th>
<th>Topic</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nov 3</td>
<td>Java</td>
<td>slides</td>
</tr>
<tr>
<td>Nov 5</td>
<td>Mid Term 2</td>
<td></td>
</tr>
</tbody>
</table>

To encode fonts, color, table layout, links, etc., web servers and clients communicate using **XML** ... roughly

```html
<p align="center"><font size="+2">CS 2010</font></p>
<table>
<tr>
<td>Date</td> <td>Topic</td> <td>Notes</td>
</tr>
<tr>
<td>Nov 3</td> <td>Java</td> <td>slides</td>
</tr>
<tr>
<td>Nov 5</td> <td>Mid Term 2</td> <td></td>
</tr>
</table>
```
Examples in DrScheme...
Generating XML

Since XML has an S-expression like structure, and since we're using Scheme, it makes sense to generate S-expressions and convert them to XML

```scheme
(xexpr->string '(html () "Hello"))
"should be" "<html>Hello</html>"

(xexpr->string '(html () "0 < 1"))
"should be" "<html>0 < 1</html>"

(xexpr->string '(html ()
    (font ((size "+2"))
        "Hello")))
"should be"
"<html><font size=+2>Hello</font><html>"
```

If you're using Java, then you'll generate object trees instead of S-expressions, but it's the same idea
Family tree server in DrScheme...