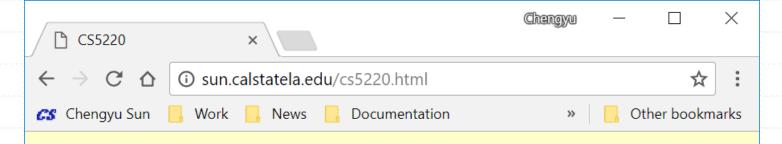
CS5220 Advanced Topics in Web Programming Course Overview

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Static Web Page



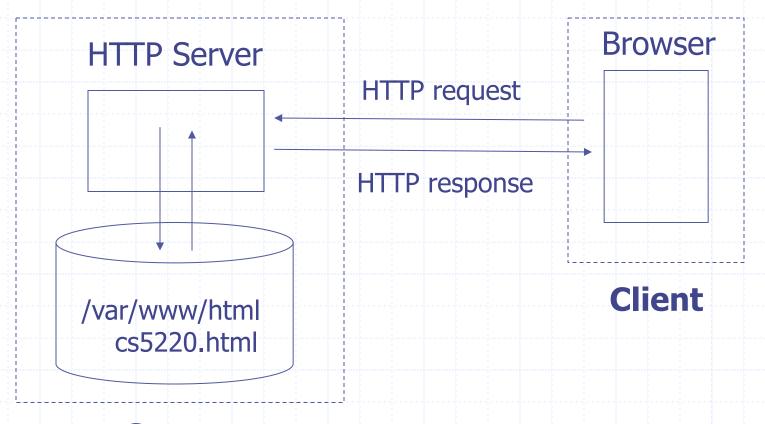
Welcome to CS5220

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How the Web Works

http://sun.calstatela.edu/cs5220.html

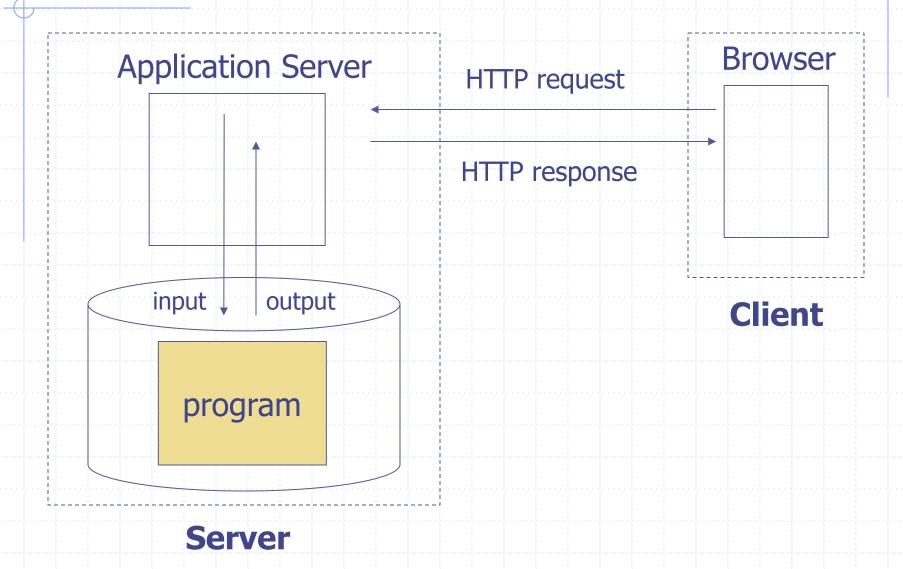


Server

Dynamic Content

- Web search results
- Shopping cart
- **...**
- Anything that need to be generated on the fly based on user request

Produce Dynamic Content



CGI - Perl

```
#!/usr/bin/perl
print "Content-type:text/html\n\n";
print '<html>';
print '<head>';
print '<title>Hello</title>';
print '</head>';
print '<body>';
print '<h2>Hello World in CGI!</h2>';
print '</body>';
print '</html>';
```

Embed Code in HTML - JSP

```
<!DOCTYPE html>
<html>
<body>
  <% if ( Math.random() < 0.5) { %>
    <h1>Have a nice day!</h1>
  <% } else { %>
    <h1>Have a lousy day!</h1>
  <% } %>
</body>
</html>
```

Embed Code in HTML - ASP

```
<!DOCTYPE html>
<html>
<body>
<%
    If hour (time) < 10 Then
        response.write ("Good morning!")
    Else
        response.write("Have a nice day!")
    End If
%>
</body>
</html>
```

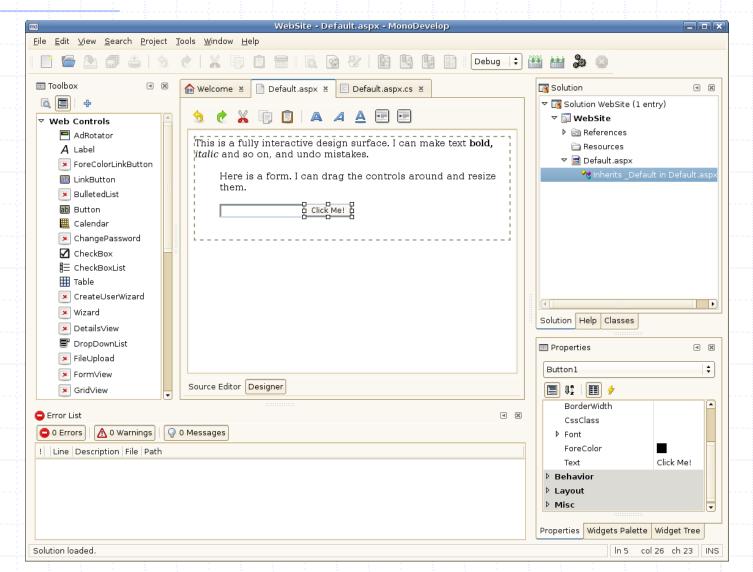
Embed Code in HTML – PHP

```
<!DOCTYPE html>
<html>
<body>
<?php
    if (date("H") < "20") {
        echo "Have a good day!";
    } else {
        echo "Have a good night!";
</body>
</html>
```

The Problem with "Page with Code"

 Mixing presentation with processing – makes the application hard to read, test, reuse, or maintain

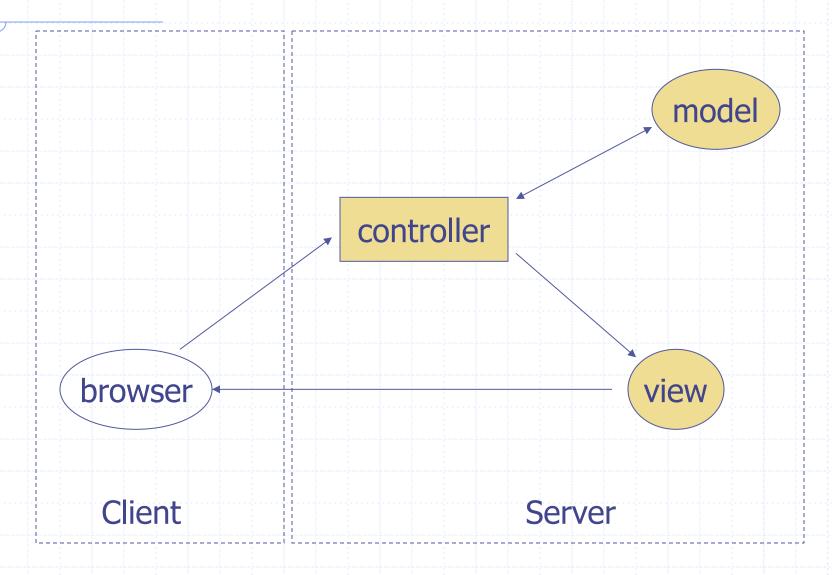
GUI Components + Event Handling Approach ...



... GUI Components + Event Handling Approach

- ASP.NET, GWT, JSF
- Advantages:
 - Pre-built GUI components
 - Visual Designer
 - Similar to developing desktop applications
- Disadvantages: see Advantages

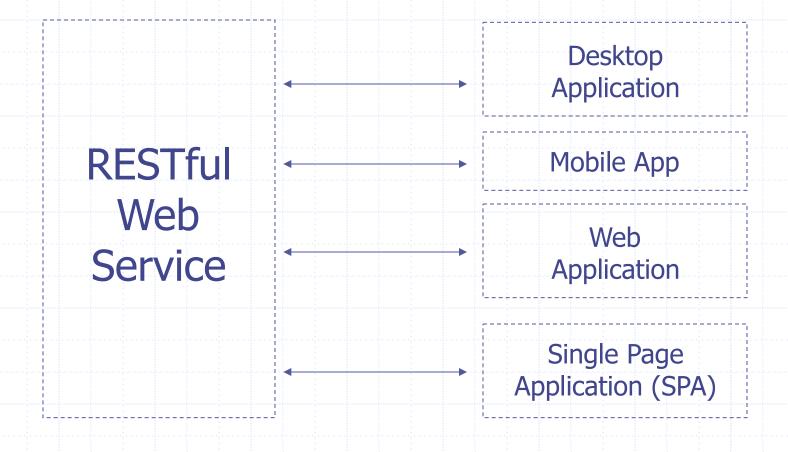
The MVC Architecture



MVC Web Frameworks

- Spring, Struts for Java
- ASP.NET MVC for C# and VB
- Zend for PHP
- Express for JavaScript
- Django for Python
- Rails for Ruby

RESTful Web Service + Client



Benefits of REST + Client

- One backend serves multiple types of frontend
- RESTful web service is more scalable than traditional web applications

Course Overview

Project Management & Collaboration

Frontend

SPA

UI Lib

REST API

Web Framework

Data Modeling & Access

Security

Deployment

Project Management and Collaboration

- Build and build tools
 - Make, Ant, Maven, NPM
- Version control
 - Git and GitHub

Data Modeling and Access ...

- Relational Database
 - PostgreSQL/MySQL
- NoSQL Database
 - MongoDB
- ORM and ODM
 - JPA, Hibernate, Mongoose

... Data Modeling and Access

- Full Text Search (FTS)
 - Database-provided FTS
 - PostgreSQL/MySQL, MongoDB
 - Standalone solutions
 - Lucene, Elasticsearch

Web Services

- Traditional web services
 - SOAP, WSDL, UDDI
- RESTful web services

Web Frameworks

- Frameworks
 - Spring (Java)
 - Express (Node.js)
- Implementing RESTful web services (a.k.a REST API)
- Other common tasks
 - Logging, testing, validation, file upload, email ...

Frontend

- Single Page Application
 - Angular
- UI libraries
 - Bootstrap

Security and Deployment

- Web application security
 - Spring Security (Spring)
 - Passport (Express)
 - JWT
- Deployment
 - Deployment on servers and cloud services