Java Web Application

- Servlets
- Beans
- JSPs
- Static resources
  - HTML, CSS, images, ...
- Metadata files
  - web.xml, ...

Putting It All Together – The User Registration Example

- Register a new user
- List all existing users

Using JSP + Bean

- Beans: User and UserManager
- JSPs: Register.jsp and Users.jsp
- Problems??

Model 1 Architecture

- JSP + Bean
  - JSP for presentation
  - Bean for business logic

Problems of Model 1 Architecture

- Using scripting elements mixes presentation and processing
  - Hard to debug, maintain, or reuse code
- Not using scripting elements limits the interaction between presentation and processing to getters and setters
  - Tedious to program
  - Beans are no longer independent of the presentation layer, i.e. special getters/setters are needed
Improve Model 1 Architecture

Model 2 Architecture

About MVC

MVC in a Web Application ...

... MVC in a Web Application

User Registration Example Using MVC
About the MVC Example

- Servlets do NOT generate HTML directly
  - No `out.println()`
  - Redirect and Forward
- JSPs are only used for display
- Use of scopes
  - Application and session scopes are shared by all servlets and JSPs
  - Request scope is used for passing data from a servlet to a JSP

Model 1 vs. MVC

- Model 1
  - Requires less code
  - Good for simple applications
    - E.g. labs and exams
- MVC
  - Requires more code
  - Java is verbose
  - Good for complex applications
    - E.g. homeworks