

Chapter 1

An introduction to web programming with Java

Contact information of Lecturer

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Course syllabus

- Introduction to Web programming
- HTML/CSS/Javascript
- MVC Model
- Java Servlets
- Java Server Pages (JSP)
- Session and Cookies
- Java Beans/JSP Expression Language
- JSP Standard Tag Library
- JDBC
- Spring Framework
- Spring Data JPA/Hibernate
- Java Web Services/Spring Rest API

Objectives

Knowledge

1. Name the software component that runs on the client of a typical web application.
2. Name the two software components that run on the server of a typical web application.
3. Distinguish between HTML and HTTP.
4. Distinguish between static web pages and dynamic web pages.
5. Name three approaches for developing Java web applications.
6. Describe the software components that are required for developing servlet and JSP applications.
7. List and describe the three layers of a typical Java web application.
8. In general terms, describe the use of these directories as defined by the J2EE specification: webapps, document root, WEB-INF, and WEB-INF\classes.

Objectives (continued)

9. Name two IDEs that can be used for developing Java web applications.
10. Name two web servers that can be used for developing Java web applications.
11. Name a popular database server that can be used for developing Java web applications.

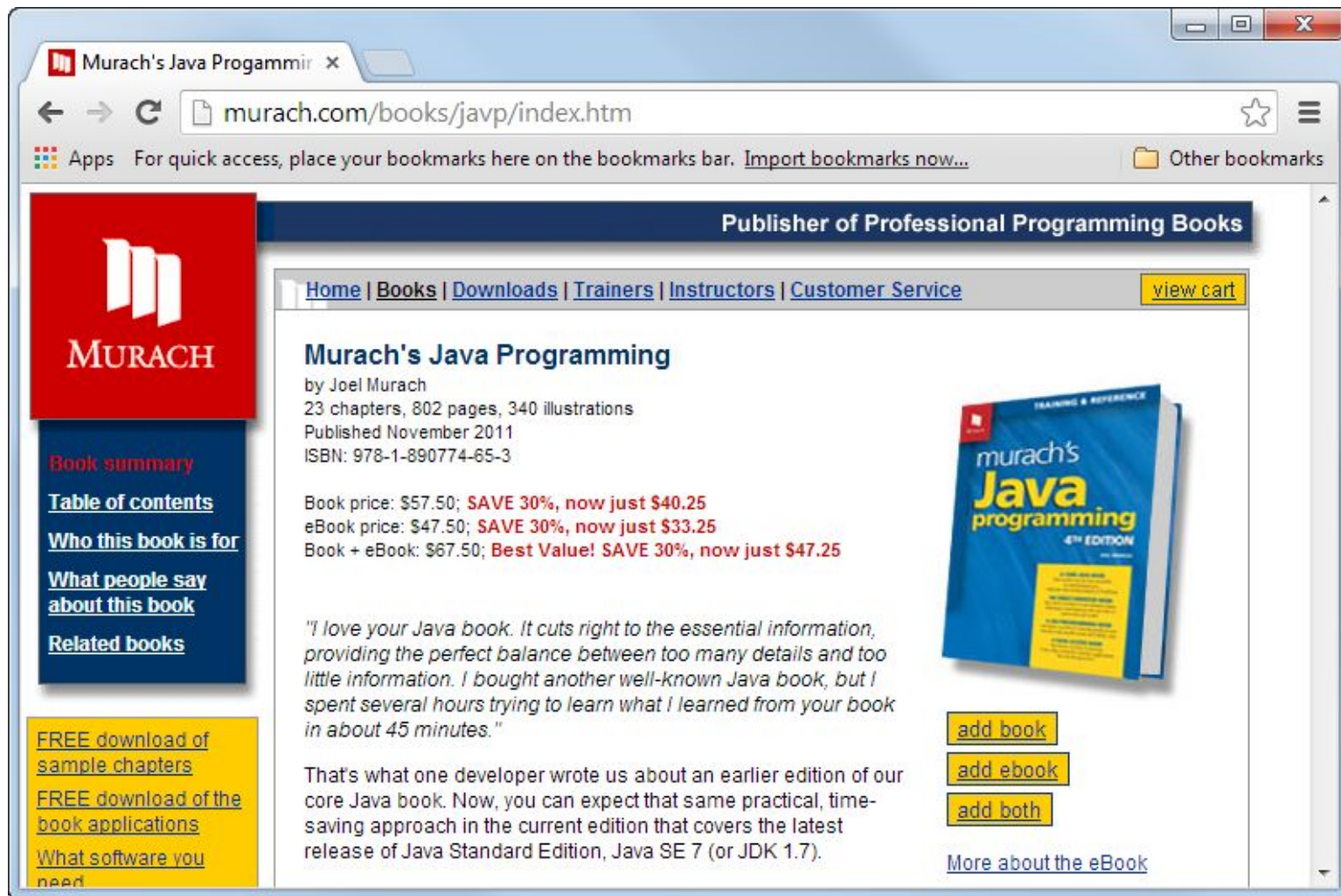
Course materials

- J. Murach, M. Urban. Murach's Java Servlet and JSP. 3rd Edition", 2014.
- Spring in Action, 5th Edition
- Bài giảng Lập trình Web, Học viện Công nghệ Bưu chính Viễn thông.
- Slides
- Google Classroom

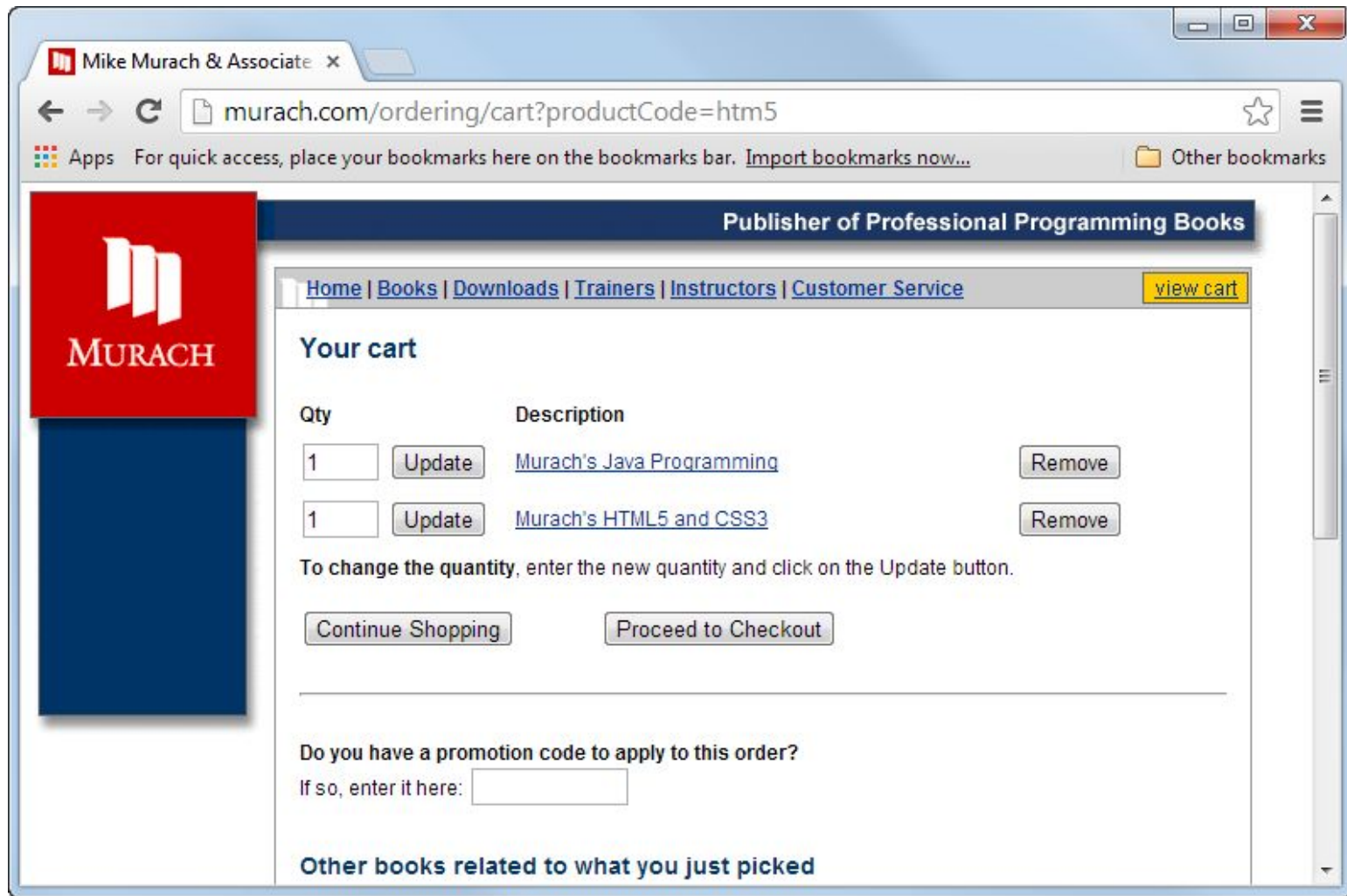
How to grade?

Chuyên cần	10%	Slink
Lab	20%	6 buổi
Project	20%	Nhóm
Final exam	50%	Thi phòng máy

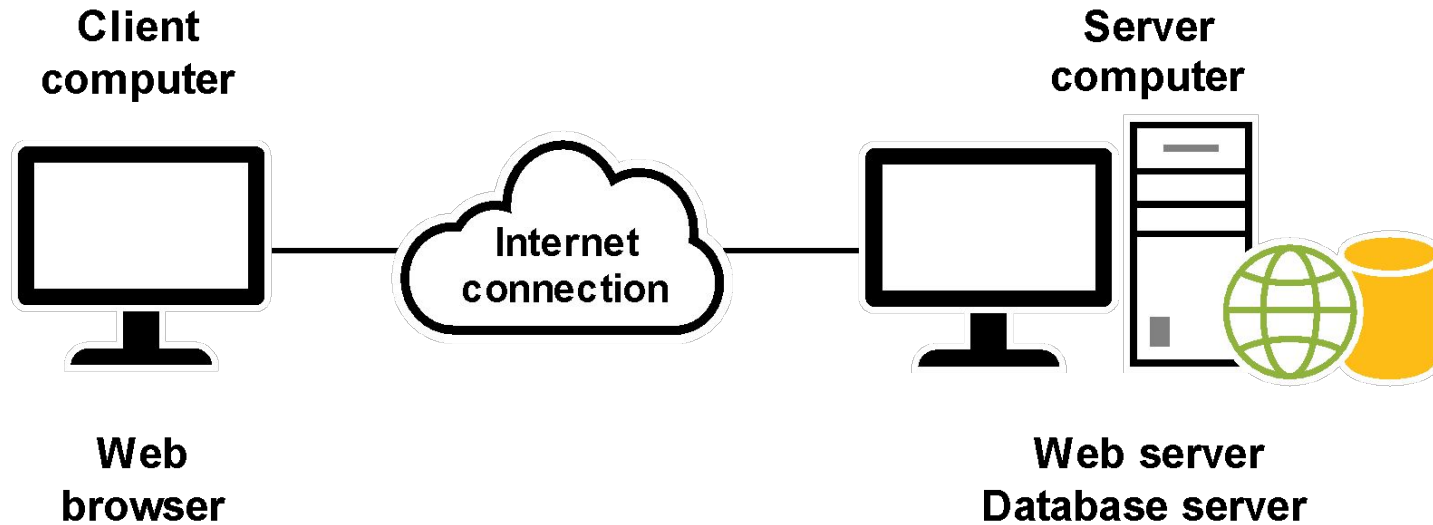
The first page of a shopping cart application



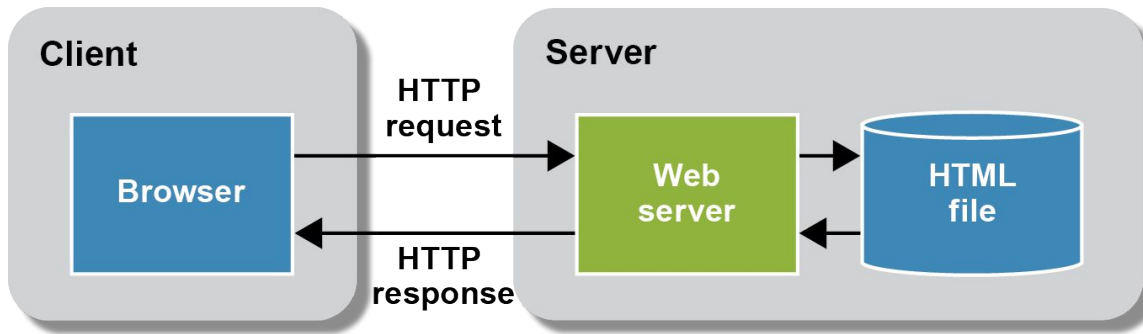
The second page of a shopping cart application



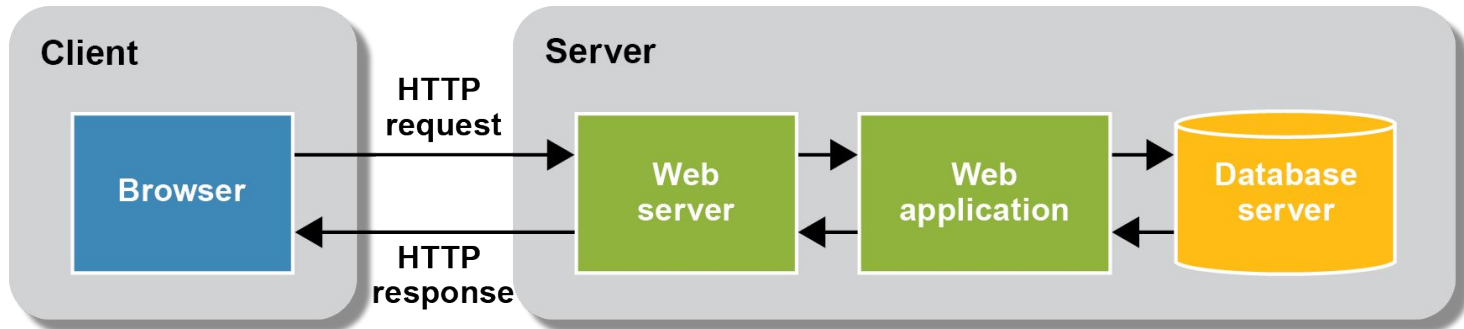
Components of a web application



How a web server processes static web pages



How a web server processes dynamic web pages



Three approaches for developing Java web apps

Servlet/JSP

- Is a lower-level API that does less work for the programmer.
- Provides a high degree of control over the HTML/CSS/JavaScript that's returned to the browser.

JSF

- Is a higher-level API that does more work for the programmer.
- Makes it more difficult to control the HTML/CSS/JavaScript that's returned to the browser.

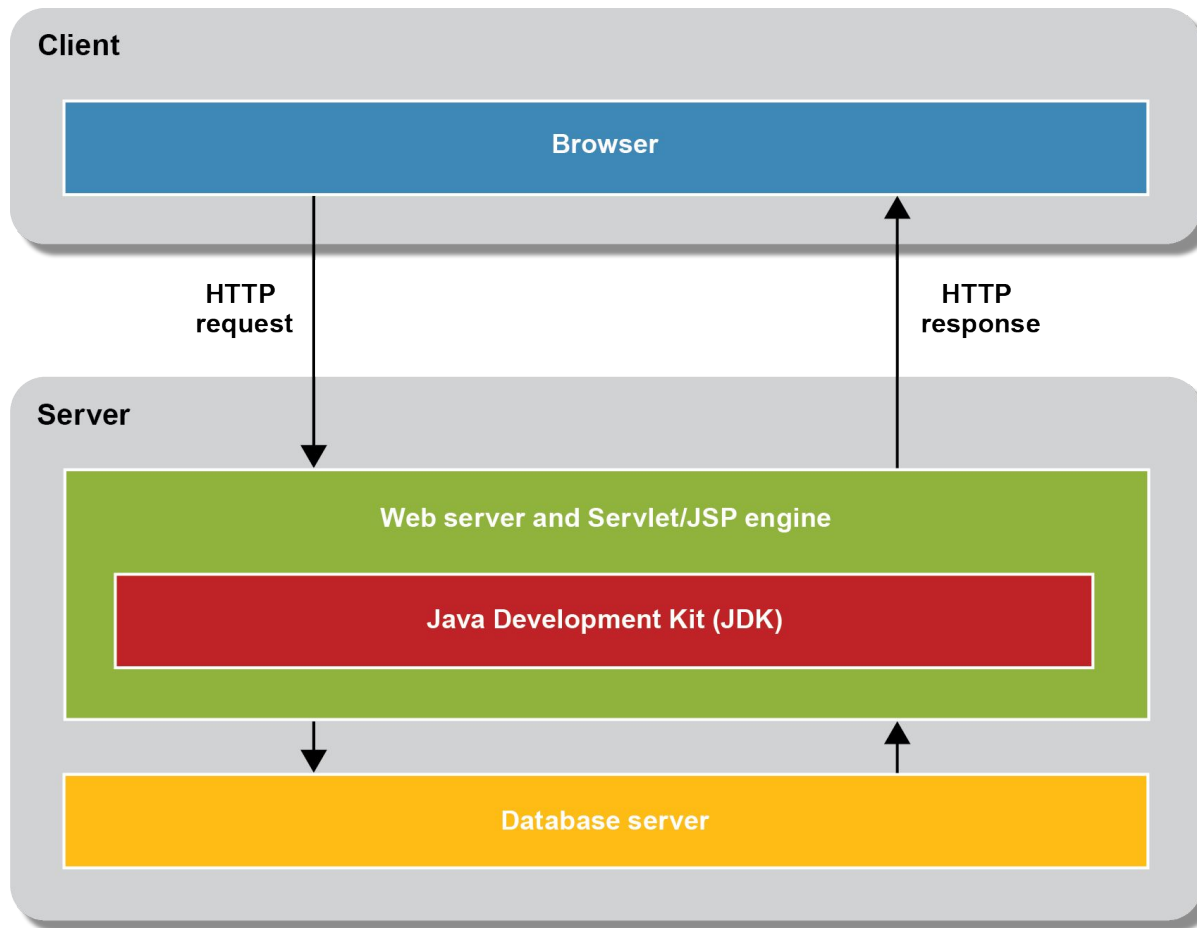
Spring Framework

- Is a higher-level API that does more work for the programmer.
- Provides a high degree of control over the HTML/CSS/JavaScript that's returned to the browser.

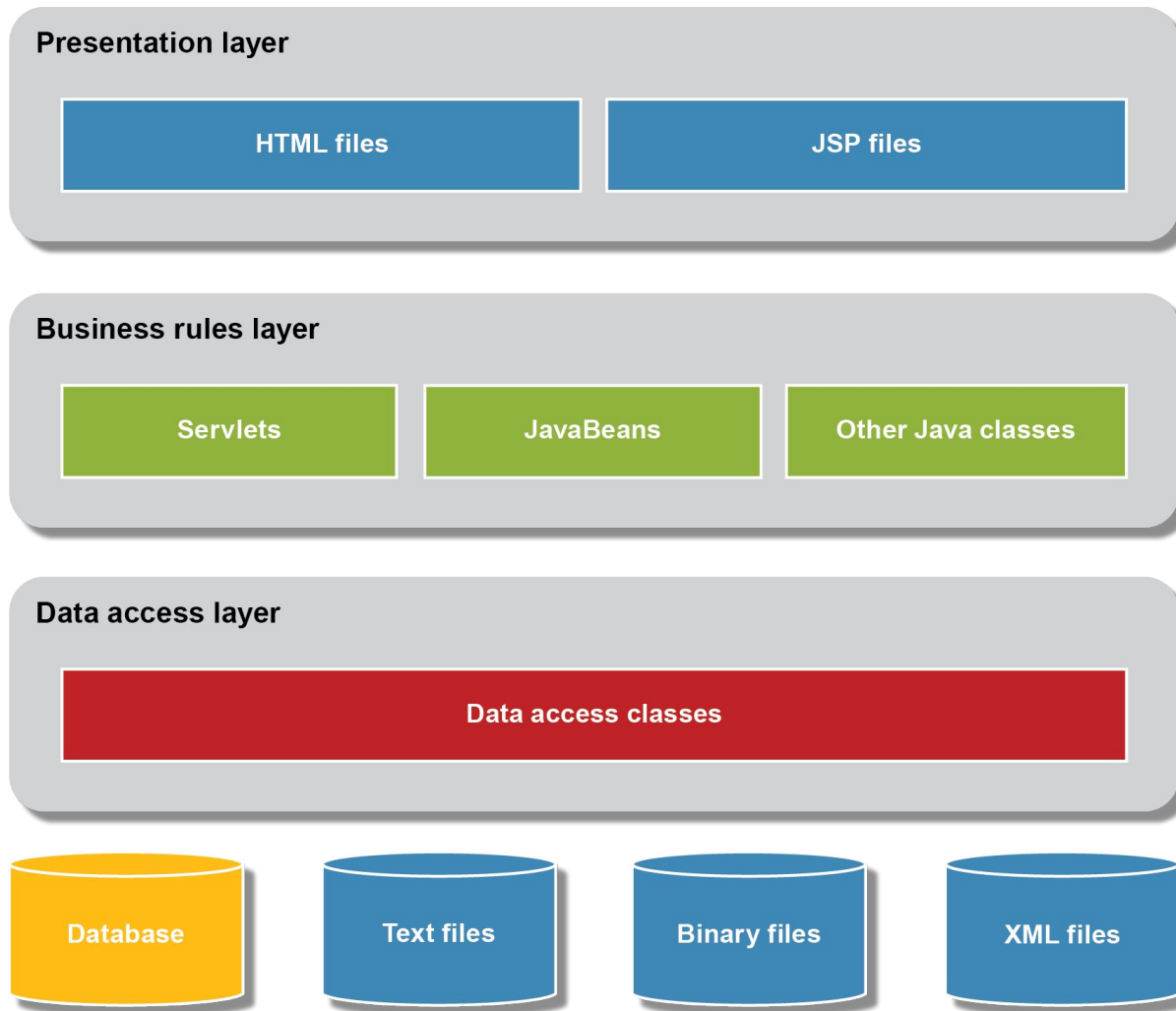
Terminology

- The *Java Standard Edition (Java SE)* includes the *Java Development Kit (JDK)* and the *Java Runtime Environment (JRE)*.
- The *Java Enterprise Edition (Java EE)* specification describes how web servers can interact with all Java web technologies.
- *Servlets* store the Java code that does the server-side processing.
- *JavaServer Pages (JSPs)* store the HTML that defines the user interface.
- *JavaServer Faces (JSF)* provides a higher-level API that replaces both servlets and JSPs.
- *Java Persistence API (JPA)* is an API for working with databases.

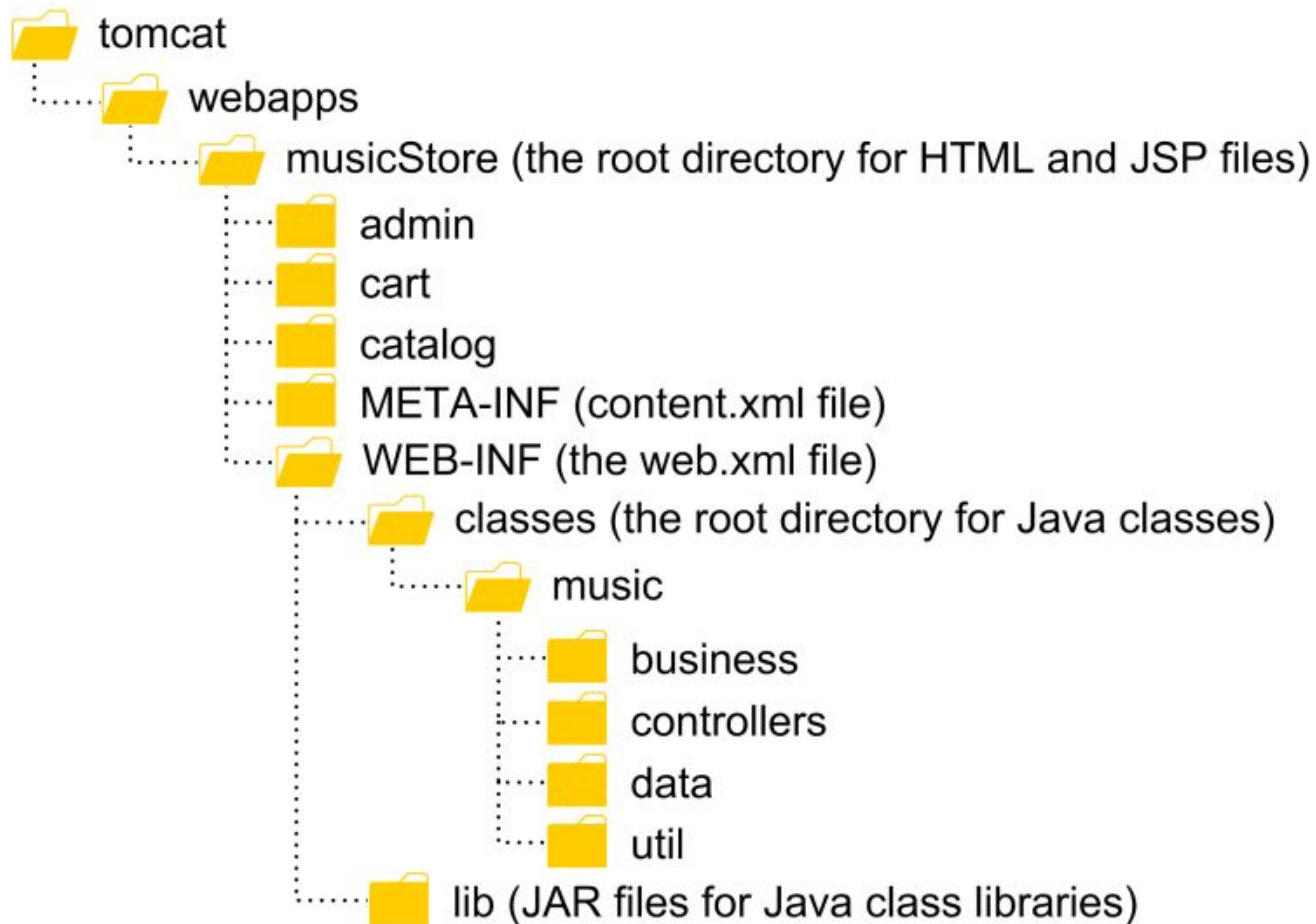
The components of a servlet/JSP application



The architecture for a servlet/JSP application



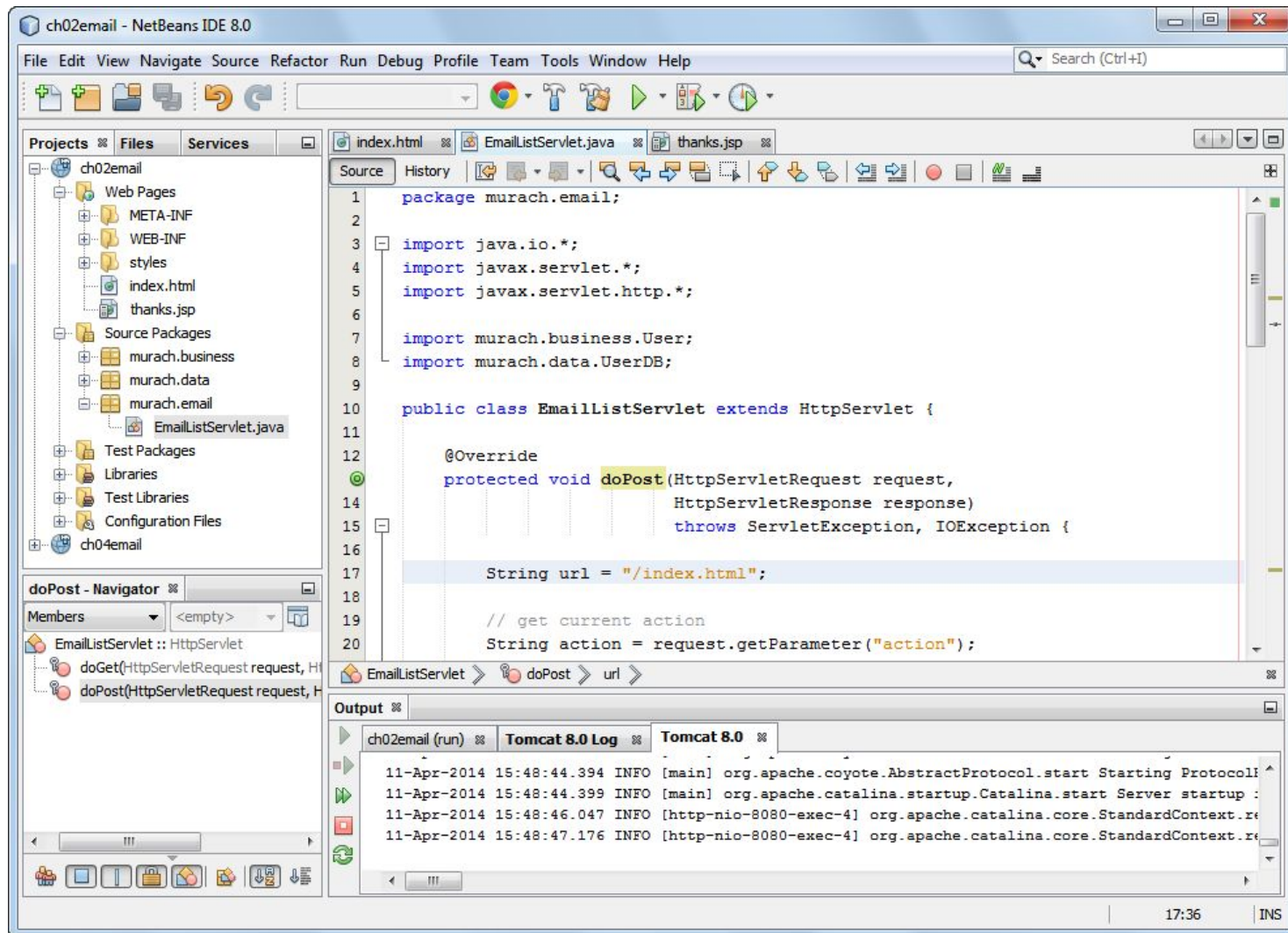
The directory structure for a web application



The directories and files for a web application

Directory	Description
(root)	Contains the HTML and JSP files.
\WEB-INF	Contains the web.xml file and is not directly accessible from the web.
\WEB-INF\classes	Contains the servlets and other Java classes for your application. Each subdirectory corresponds with the package for the Java class.
\WEB-INF\lib	Contains any JAR files that contain Java class libraries that are used by the web application.
\META-INF	Contains the context.xml file that configures the web application context.

The NetBeans IDE



Popular IDEs for Java web development

- NetBeans
- Eclipse
- IntelliJ IDEA

Two popular web servers

Tomcat

- Is a servlet/JSP engine that includes a web server.
- Is free, open-source, and runs on all modern operating systems.
- Is a popular web server for Java web applications.

GlassFish

- Is a complete Java EE application server.
- Is free, open-source, and runs on all modern operating systems.
- Provides more features than Tomcat.
- Requires more system resources than Tomcat.

Other popular web servers

- WildFly (formerly JBoss)
- Jetty
- Oracle WebLogic
- IBM WebSphere

A popular database server

MySQL

- Is a relational database server that implements most of the SQL standard.
- Is free, open-source, and runs on all modern operating systems.
- Is the most popular database server for Java web applications.

Other popular database servers

- PostgreSQL
- Oracle

An ISP that provides servlet/JSP web hosting

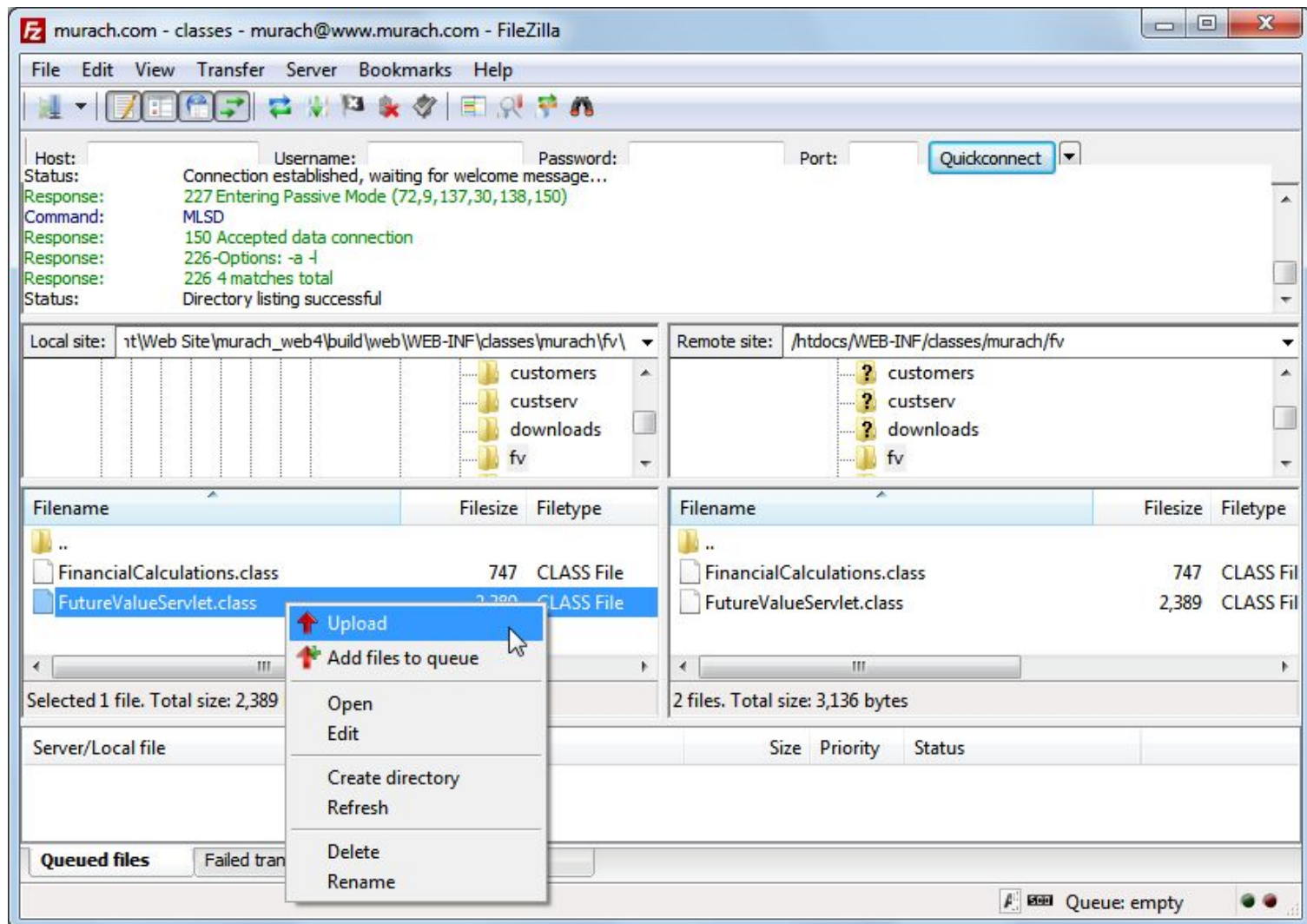


The screenshot shows a web browser window with the address bar displaying www.mmaweb.net. The website has a blue and white color scheme. At the top, the MMA logo is followed by the text "web hosting sales" and the phone number "(716) 689-1593". There are links for "FAQs" and "Account Login". A navigation bar contains links for "HOME", "HOSTING", "SERVICES", "SUPPORT", "ORDER", "ABOUT US", and "SOFTWARE".

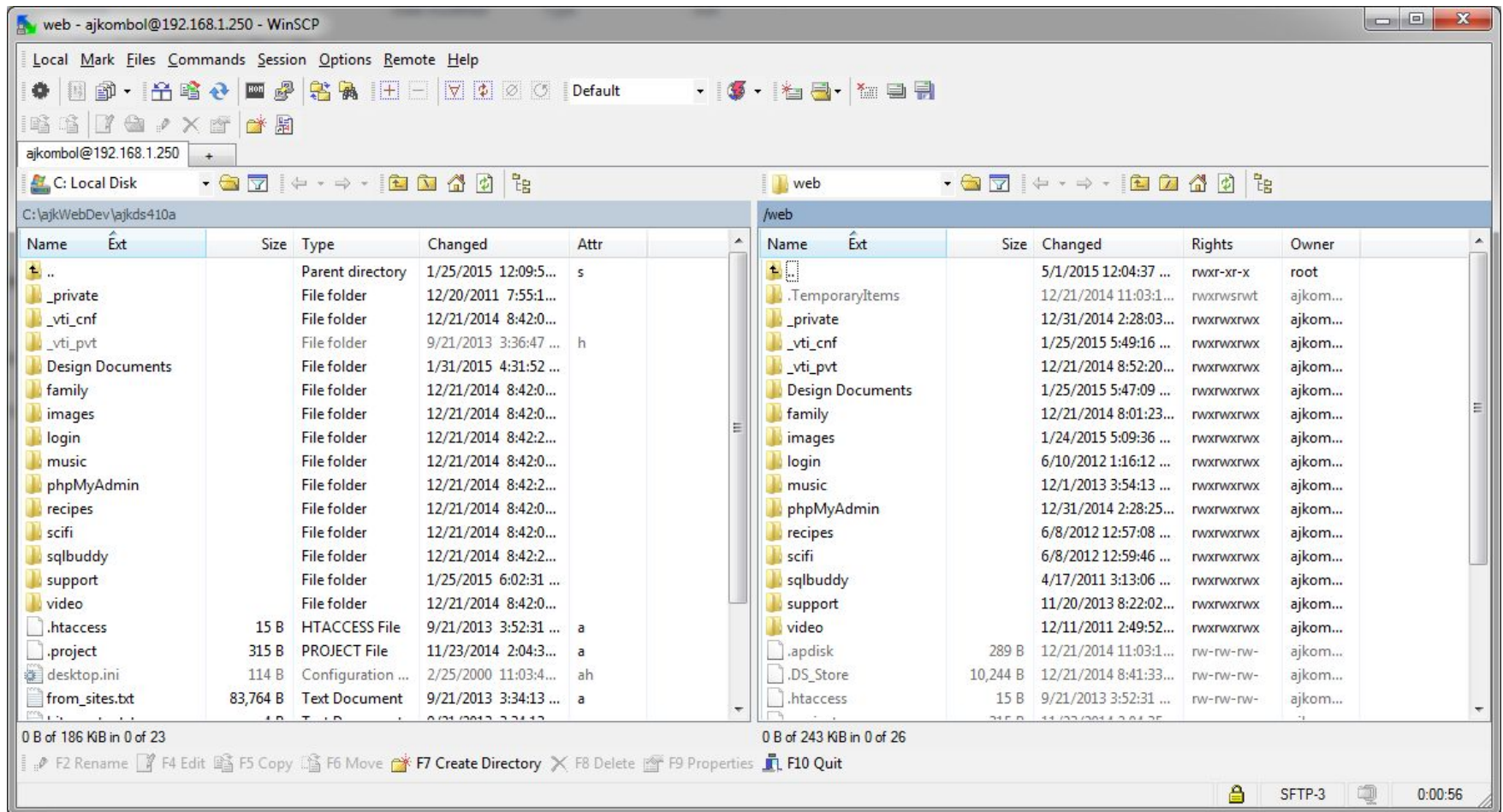
The main content area is divided into three columns:

- Left Column:** A section titled "DOMAIN REGISTRATION" with the text "Don't have a domain yet? See if yours is available by checking our whois gateway:". Below this is a form with a text input field labeled "Domain (.com, .net, .org)" and a "Check" button.
- Middle Column:** A large green "web hosting" logo. Below it, text describes "JSP hosting and servlet hosting accounts with advanced, scalable server technologies like Servlets, Java Server Pages (JSP), Enterprise JavaBeans (EJB) and XML are what MMA specializes in." Below this is a paragraph: "The result is a continuous upgrade path that lets small businesses launch websites built on proven technology that can grow as you achieve success without the need to rebuild and redeploy your core" followed by a cartoon illustration of a yellow cat.
- Right Column:** A section titled "Private JVM with Every Account!". It lists three account types with their monthly prices:
 - STARTER ACCOUNT: \$24.99 per month*
 - COMMERCE ACCOUNT: \$49.99 per month*
 - ENTERPRISE ACCOUNT: \$99.99 per month*A footnote at the bottom states: "* Plus one-month setup fee at start of first month."

The FileZilla program



WinSCP



WinSCP – Synchronize

Synchronization checklist

Name	Local directory	Size	Changed	Remote directory	Size	Changed
.apdisk				/	289	12/21/2014 11:03:1
.DS_Store				/	10,244	12/21/2014 8:41:30
.TemporaryItems\				/		12/21/2014 11:03:1
siteMap.vsd	.\Design Documents\	106,496	1/31/2015 3:18:35 PM	./Design Documents/		
.DS_Store				./family/	6,148	12/21/2014 8:01:20
htaccess				./family/Kathy/	15	5/24/2013 7:08:55
Thumbs.db				./family/Kathy/	20,480	9/21/2013 3:55:52
Thumbs.db				./family/Kathy/_vti_cnf/	203	9/21/2013 3:55:52
.DS_Store				./family/NewHouse/	10,244	12/22/2014 11:28:4
Drawings\	.\family\NewHouse\		2/11/2015 7:43:12 PM	./family/NewHouse/		
Final Punch list April\family\NewHouse\	2,548	4/19/2015 8:16:17 PM	./family/NewHouse/		
HomeDesignCover.p...				./family/NewHouse/	122,880	10/5/2013 3:34:46
lot 379-1.doc	.\family\NewHouse\	95,744	3/12/2015 10:26:19 PM	./family/NewHouse/		
NewHousePayments...	.\family\NewHouse\	10,056	3/29/2015 5:43:27 PM	./family/NewHouse/	10,467	11/17/2014 8:32:3
Thumbs.db				./family/NewHouse/	36,352	12/21/2014 8:48:20
HomeDesignCover.p...				./family/NewHouse/_vti_cnf/	204	10/5/2013 3:34:46
Thumbs.db				./family/NewHouse/_vti_cnf/	245	4/3/2014 11:37:27
.DS_Store				./family/NewHouse/Construction Pictures/	14,340	12/22/2014 11:26:5
Apr27-2015-1.JPG	.\family\NewHouse\Constructi...	3,138,905	4/28/2015 7:21:03 PM	./family/NewHouse/Construction Pictures/		
Apr27-2015-2.JPG	.\family\NewHouse\Constructi...	2,554,114	4/28/2015 7:21:19 PM	./family/NewHouse/Construction Pictures/		
Apr27-2015-3.JPG	.\family\NewHouse\Constructi...	3,031,236	4/28/2015 7:21:37 PM	./family/NewHouse/Construction Pictures/		
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Feb 11-1.JPG	.\family\NewHouse\Constructi...	1,980,224	2/11/2015 7:53:45 PM	./family/NewHouse/Construction Pictures/		
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Jan31-3.JPG	.\family\NewHouse\Constructi...	1,897,480	2/1/2015 3:50:04 PM	./family/NewHouse/Construction Pictures/		
Jan31-4.JPG	.\family\NewHouse\Constructi...	2,052,162	2/1/2015 3:49:48 PM	./family/NewHouse/Construction Pictures/		
Jan31-5.JPG	.\family\NewHouse\Constructi...	2,335,550	2/1/2015 3:49:55 PM	./family/NewHouse/Construction Pictures/		
March26-2015-1.JPG	.\family\NewHouse\Constructi...	2,624,339	3/26/2015 9:38:45 PM	./family/NewHouse/Construction Pictures/		

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