

Introduction MySQL

Open Source SQL Database

Outline

- Database Introduction
- MySQL Introduction
- Basic MySQL Cmds:
- PHPMyAdmin
- Sql Script File
- cim.saddleback.edu/submit
- MySQL Intrinsic Functions
- MySQL Interface JConnector
- Sample Java JDBC Program
- Sample JSP/JDBC Program
- JSP Recursive Form

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Databases

- Database is a Collection of Tables
- Table
 - Data Set Organized into Rows & Columns
 - In a specific table all rows share the same columns
 - Table is a Single Row/Column Spreadsheet
 - Relational Database Management System (RDMS) manages Tables
 - Tables Have Relationships Within themselves & between others
- Row is a record: collection of fields
- Column is a field: single data item/entity

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Database Introduction

Database Objectives

- Seek to Organize Large Amounts of Information
- Retrieve Data By Asking Questions "Query"
- Concerns are:
 - Detailed Privileges, Synchronized Access & Sharing
- Bring OS File Privileges to More Detailed Level
- Synchronized Access
 - Lock Databases, Tables, Records, &/or Fields
 - Privileges on Tables, Databases, Edit/View

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PHPMyAdmin Privilege Page

The screenshot shows the 'Edit Privileges' page in PHPMyAdmin. It displays global privileges for the user 'jstudent0@localhost'. The 'Data' section includes SELECT, INSERT, UPDATE, DELETE, and FILE. The 'Structure' section includes CREATE, ALTER, INDEX, DROP, CREATE TEMPORARY TABLES, SHOW VIEW, CREATE ROUTINE, ALTER ROUTINE, and PROCEDURE. The 'Administration' section includes GRANT, SUPER, PROCESS, RELOAD, SHUTDOWN, SHOW DATABASES, LOCK TABLES, REFERENCES, REPLICATION CLIENT, REPLICATION SLAVE, and CREATE USER. The 'Resource limits' section includes MAX_QUERIES_PER_HOUR, MAX_UPDATES_PER_HOUR, MAX_CONNECTIONS_PER_HOUR, and MAX_USER_CONNECTIONS. At the bottom, there is a table for 'Database-specific privileges' with columns for Database, Privileges, Grant, Table-specific privileges, and Action.

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Database Structures

- Hierarchy
 - Directory Structure
 - LDAP/Active Directory Services
- Flat : NIS/AWK, Outlook, /etc/passwd
- Relational Databases
 - Minimize Repeat Information By...
 - Relating Tables – Usually with a Key
 - Each Row Has a Key(s) For Identifying & Indexing

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Fruit: Relational Database

storeFact Table				genericFact Table			
ID	Shelf Life		Avg Price	ID	Name	Description	Color
	G → Ripe	R → Rotten		1	Apple	Jonathon	Red
1	10	5	.50	2	Pear	Asian	Yellow
2	5	5	1.0				
3	20	5	75				

inventoryLine: Table				
ID	Quantity	Date Arrived	Condition	Order #
1	1000	2005-11-20	Ripe	200
2	5000	2005-10-15	Green	300
1	500	2005-11-14	Ripe	100

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Simplified Fruit Database

fruit			inventory	
fruitID	Name	Price	InventoryLine	
1	Apple	2.50	fruitID	Quantity
2	Pear	3.00	1	100
4	Grpe	.75	3	500
5	Peach	1.25	2	100
8	Pluot	4.50	5	10
6	Plum	1.25	1	250
3	Banana	1.00	2	200

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Database Quiz Questions

- 1 A Database is a Collection of _____.
- 2 A Table is a collection of _____ or _____.
- 3 A Row contains _____ or _____.
- 4 RDBMS Stands for?
- 5 RDBMS
 - Seek to Form _____ among/between Tables
 - Minimize _____ Information.
- 6 When You Ask a DB a Question You are?

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SQL: Structured Query Language

- Session Layer Protocol for Network RDMS Access
- Developed Sequel 1970 By IBM
 - 1980 SQL (Called Sequel or "ESS CUE EL")
- Language Developed for RDMS
- Made Popular By IBM/Oracle/PeopleSoft
- Has Become a De facto DB Standard
- Full Featured "Bloated" Language
 - PL/SQL (Procedure Language)
 - Best to Use the Right Tool PHP/MySQL

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MySQL.com Key Points

- Open Source RDMS With Full SQL Implementation
- Web Hosting Sites Usually Provide 1 MySQL DB
- LAMP De facto Small/Med. Business standard
- MySQL Works Closely with Zend/PHP
- Interfaces to Perl, C++, Python, Java;
- Currently Own my Sun Microsystems
- Support PLSQL (Programming Language)
 - Use the Right Tool (Java + J)
- Has Become a coveted Certificate
 - Any good Salary Charts?

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- Support PLSQL (Procedural Language)
 - Use the Right Tool (Java + JDBC)
- Has Become a coveted Certificate
 - Any good Salary Charts?

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Certificates.com Hot Certificates

	2006	2005	2004	2003	2002
1	RHCE	CCIE Internetwork Expert	MCSE: Security	CCIE	MCSA
2	MS SQL .net	MCSE: Security	Tie Security+, CCIE	Security+	Oracle: DBA
3	MS Certified Architect	RHCE – Redhat Certified Eng.		RHCE	CCNA Cisco
4	CCSP & PMP	Cisco Certified Security Pro.	CCNP	CCNP	CCNP
5		CCNP Cisco C Net Pro.	RHCE	Certified Info. Sys. Security Pro. CISSP	MCDBA
6	Cisco Inter-network Expert	Linux Pro. Institute	MCDST MS Desktop Support	Checkpoint Certified Security Admin	RHCE
7	CCNP	Novell Linux	CISSP, MCSE, MS Exchange	Linux+ CompTIA	Network+
8	MSCE: Sec	MySQL		MCSA Microsoft Cert Sy Ad.	Citrix Cert. Ad.
9	SSCP System Security	Security+	MCDBA MS DB Admin.	Sun Solaris SA	Java Pro
10	Linux Pro	PMP	PMP	MCDMA, Citrix Enterprise	CISSP

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MySQL Evolving

- MySQL 5.0, PHP 5.0 & PHP Collaboration
 - Push into Mission/Business Critical System
 - DB2 & Oracle De Facto Standards Large Systems
 - 3/2009 Releases MySQL 6.0
- PHP3,4 Most Used Server-Side Scripting Language
 - Fun to Use – Rock n Roll is only 3 Notes
- Looks to Be the Up & Coming RDMS
 - Strong Amazon Book Momentum
- Sun Paid \$1B for MySQL
- IBM may Buy Sun for \$6B (Datacenter)

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Amazon Book Momentum

Search	Total Book	After 03*	Momentum
Oracle	2441	553,640	22%
SAS	1803	274,333	15%
SAP	830	168,221	20%
SQL Server	828	109,177	13%
DB2	380	56,68	15%
MySQL	232	102,120	49%

PL/SQL 18/149=12%; ABAP 5/29=17%; Microsoft SQL Server 49/722 (advance)
 * First Number After 03 to 1/2006; Second Number is After 03 to 8/2006

- Momentum Key:
 - >20% Hot Sun Rising
 - 15% Mid Day
 - <10% "Cooling Off Sun Setting"

Cyclic Fade or is DB Hot? – MySQL is Catching Fire

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Database is Hot MySQL is Catching Fire

- More and More Data –
 - NewsFinder Oracle 18% SW Sales Increase
- Data is Worthless Unless Organized
 - Better Search Engines
 - Desktop Search
 - Beagle (Bleeding Edge Search Tool)
 - Implement SQL on Desktop
 - Original LongHorn/Vista Objective
 - Key Database Add Organization
 - Data → Information

Meaning
 Organization
 ↓
 Data
 Information
 Knowledge
 Wisdom

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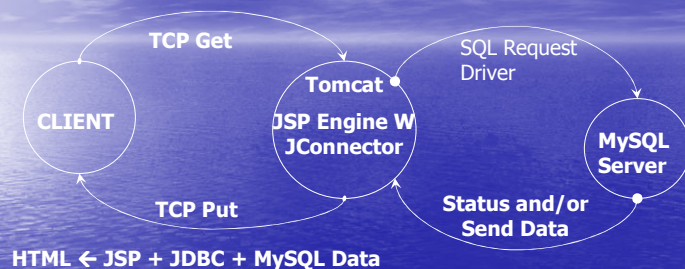
Key Occupations...

- Information Processor/Data Entry
 - Enter Data Into Database
- Data Analyst
 - Specialist in Organizing Data
 - Data Generally Organized by a Key Field
 - Key : Simple Key
 - Unique Key: can be null but all are distinct
 - Primary Key: each row distinct no Nulls
- Database Administrator – System Admin

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CS4B



JConnector Java Interface (aka Driver) to MySQL

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MySQL Quiz Summary

- 1 SQL Stands For?
- 2 MySQL supplies both a _____ and SQL Language Interface
- 3 PL SQL is?
 - Should you use PL SQL?
- 3 MySQL 5.0 is a Nice Toy RDMS used for Learning?
- 4 If You Learn MySQL commands you also know DB2, Oracle and SQL Server?

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MySQL CS4B Assignments

SQL Script versus Java Source Code
PHPMyAdmin Highlights
Review Select Query
CS4B Assignment
cim.saddleback.edu/submit

Script versus Source Code

SQL Script		Java File
;	Line Terminator	;
Ignored	Extra White Space	Ignored
#	Comment to	//
--	End of Line	
/* Multi-line Comment Not Supported by Submit		
On the Fly Execution		Compile to a Class File
Batch Process		Execute the App

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Select Syntax

- Select [expression] from table
[where where_conditional]
[order by fieldName [ASC | DESC]]
[limit [offset,] rowCount] ;
- Display expression
 - * For All Fields, or a Field Name
 - Or an Expression Stand alone or Field Based

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Sample Script: fruitCS4.sql First Attempt

#1 Display fruit Table contents price increasing

```
Select name, price from fruit  
Order by price ASC;
```

#2 Display name, price of most expensive fruit

```
Select "Not Know";
```

#3 Display all inventory Records

Will Test this on Submit Later on, Enter it w PHPMyAdmin

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cim.saddleback.edu/phpMyAdmin

- Web-Based PHP Interface to MySQL
- Initial Assignment Create DB
- Ideal For Data Manipulation & Creating Tables
- SQL Window – to test and execute Queries
 - Basic Browse Queries w order, limit just a click

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SQL Select Assignments

- <http://cim.saddleback.edu/~premiere>
- fruitCS4B.sql
 - Has Set of Comments
 - You need to Write Query
- Use PHPMyAdmin create Queries
- Save Query to Script File

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<http://cim.saddleback.edu/submit>

- Automatically Creates Script
- Saves Script to your Home Folder
- On Submit Tests Script Against Known Solution
 - Most Recent Attempt is Recorded
- **Comments either # or - - at Start of Line**
- **Comments and Blanks Lines Removed**
- **First Query is Query 1;**
 - Skip Unknown Query w select "not";
 - End Query with a Semicolon ;

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MySQL Intrinsic Functions

Help
Date
Aggregate
Examples

dev.mysql.com/doc

- PHPMyAdmin
 - Left Most Left NavBar Button
- dev.mysql.com/doc
 - Can Download chm or pdf Files
 - Can Search Forums, Blogs, Documentation
 - Left NavBar Select Reference Manuals
- Reference Left NavBar Search Manual:
- Search : Aggregate
 - Aggregate : Form by Collection



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Aggregate Functions

- Avg(field) → Average of Field
- Count(field) → Number of Fields
- Sum(field) → Sum of Fields
- Sum(expression_here)
 - Select sum(inventory.quantity*price) from fruit right join inventory on inventory.fruitID = fruit.fruitID; (every item in inventory is matched to fruit)
- Max(price) → Maximum Price
- Min(field) → Minimum field value

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Search Date – Time

- select now();
 - returns Current Date;
- dayofyear(now()); → returns day of year
- dayofmonth(now()); → returns day of month
- Date_add(now(), interval value type)
 - Date_add(now(), interval 21 day)
 - Date_sub(date, interval value type)
- Dayofweek(now()); 1 for Sunday
- Weekday(now()); 0 Monday

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Using Aggregate Functions

- # What is the average Fruit Price?
- # How Many Types of Fruit do we Have?
- # How many Days to Christmas

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Using Aggregate Functions

What is the average Fruit Price?

```
Select ave( price ) from fruit;
```

How Many Types of Fruit do we Have?

```
Select count( * ) from fruit;
```

How many Days to Christmas

```
Select dayofyear( "2009-12-25" ) – dayofyear( now() );
```

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JAVA Database Access

Package java.sql

Setting up JDBC

Fruit Database Example

FruitSelect.java

Java SQL Interface

- Java.sql (Package)
 - JDBC Connection or
 - JDBC – ODBC Bridge
- JDBC
 - Developed by Sun to Allow Access to Virtually any DB
- Connector/J JDBC connector for MySQL
- ODBC
 - Open Database Connectivity
 - Developed by Microsoft access to Windows DB & Some Unix

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CS4B Nota Bene

- Get JConnector.tar.gz or zip
- Extract Files
- Copy *.jar to Most Recent JAVA_HOME/jre/lib/ext
- This Automatically Adds Driver to CLASSPATH
- Caveat You Can Connect to CIM/MySQL Only at SB
 - Host is cim
 - Cim.saddleback.edu:3306 Blocked by ITC

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Java SQL Sequence

- Load JDBC Driver
- Define URL Connection
- Establish Connection
 - Work only on Campus, ITC Blocking Port 3306
 - Later On Will use JSP w localhost
- Create Statement Object
- Execute Query or Data Manipulation
- Process Results
- Close Connection

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Interfaces in java.sql.

- Driver
 - `Class.forName("Driver Location");`
- Connection
 - Connect to a Specific Database
 - `DriverManager.getConnection(DatabaseURL, Username, Password)`
- Statement
 - Only one open statement at a time
 - `executeBatch() – addBatch(String dataManipulation)`
 - `executeQuery(String selectQuery) - output`

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Load JDBC Driver

Using Package Path for Driver

`"org.mysql.Driver"`

`"sun.jdbc.odbc.JdbcOdbcDriver"`

`"com.mysql.jdbc.Driver"`

On CIM JConnector MySQL Driver...

`Class.forName("com.mysql.jdbc.Driver");`

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Define URL Connection

- JDBC:ODBC Bridge Connection
 - `Jdbc:odbc:data_source_name`
- For MySQL DATABASE_URL String...
 - `jdbc:mysql://hostname:port/dbname`
 - JSP or Java Execute on CIM
 - `"jdbc:mysql://localhost/database"`
 - CIM/MySQL sets all Privileges to localhost
 - In Both Cases database is DBsusername
- `connect = DriverManager.getConnection(DATABASE_URL, "SBusername", "yourPassword")`

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Sending/Process Query Result

```
// Interface java.sql.Connect (Create a Statement)
statement = connect.createStatement();

// Interface java.sql.Statement Execute Query

result = statement.executeQuery( "select * from fruit" );
int columns = (result.getMetaData()).getColumnCount();

while( result.next() ) {
    for( int i = 1; i <= columns; ++i )
        System.out.print( result.getObject(i) + "\t" );
    System.out.println( );
}
```

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Interface Java.sql.Statement

- executeQuery(String)
 - PHPMyAdmin Generates String (PHP Code)
 - May Return Multiple Results
- Data Manipulation – Batch File
 - addBatch(str); executeBatch();
 - executeUpdate(str);

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Simplified Fruit Database

fruit		
fruitID	Name	Price
1	Apple	2.50
2	Pear	3.00
4	Grpe	.75
5	Peach	1.25
8	Pluot	4.50
6	Plum	1.25
3	Banana	1.00

inventory	
fruitID	Quantity
1	100
3	500
2	100
5	10
1	250
2	200

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```
import java.sql.*;
public class FruitSelect
{
    static final String DRIVER = "com.mysql.jdbc.Driver";
    static final String DATABASE_URL = "jdbc:mysql://localhost/fruit";

    public static void main( String args[] ) {
        Connection connect = null; Statement statement = null; ResultSet result = null;
        try {
            Class.forName( DRIVER );
            connect = DriverManager.getConnection( DATABASE_URL, "userJoe", "cs4b" );
            statement = connect.createStatement();
            result = statement.executeQuery( "select * from fruit" );
            int columns = (result.getMetaData()).getColumnCount();

            while( result.next() ) {
                for( int i = 1; i <= columns; ++i )
                    System.out.print( result.getObject(i) + "\t" );
                System.out.println( );
            } catch( Exception e )
            { System.out.println( "Something Wrong->" + e.getMessage(); e.printStackTrace( ); }
        finally {
            try { result.close(); statement.close(); connect.close(); }
            catch( Exception e )
            { System.out.println( "Unable to close " + e.getMessage(); e.printStackTrace( ); }
        }
    }
}
```

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Java/JDBC Quiz

- The Java – MySQL Driver has the name?
- Which Package do you use for SQL?
- What is the class/interface name to Process results of a Query?
- CIM-MySQL Usernames and ITC support which system Access to MySQL on CIM?
- When you connect to MySQL in JSP the default system has to be?

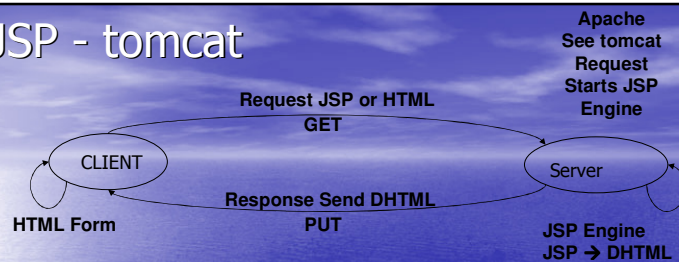
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JSP - JDBC Interface

JSP/Tomcat Background
Set Netbeans to PHP Project
Use JSP Files
Input Form (Text Box) – Select

JSP - tomcat



- Tomcat – JSP Compiler/servlet container
 - JSP Engine: JSP Page → Java Servlet
 - Servlet: Server Java Executable Thread
 - Java Compiler: Java Servlet → Servlet .class File
 - Servlet Container
 - Manages Compiled Servlet Threads
 - On Second JSP Access Output is Fast
- Apache Sends Servlet Output To Client

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Slide 47



FruitSelect.jsp

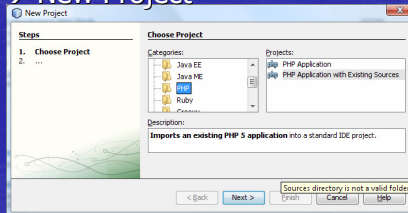
- Rewrite Previous Java File to JSP
 - JSP File Servlet is executed on localhost
- Use Netbeans as the IDE

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NetBeans IDE JSP/Hack

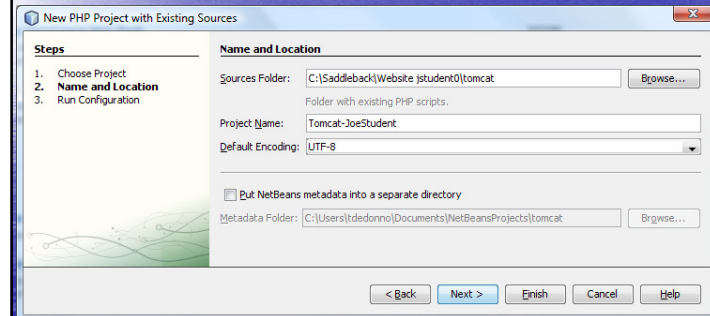
- Setup a PHP Project or use FileZilla/Browser
 - Filezilla is the Most Reliable and Best FTP Client
 - Recommend FileZilla w Web Browser Refresh
 - Unable to Find FTP Netbeans Client on JSP/Java
 - Seems Emphasis on Local Testing
- Start up Netbeans File → New Project
 - Categories: PHP
 - PHP Application



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Project Name and Location

- Select Your Local Source Folder

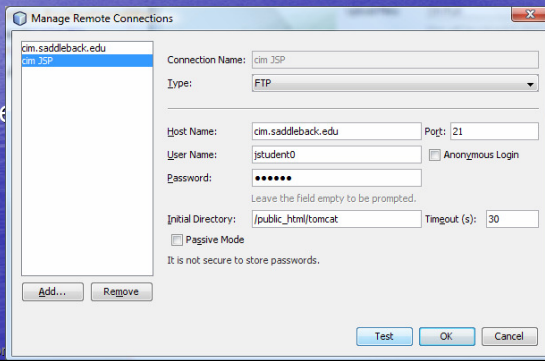


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Run Configuration

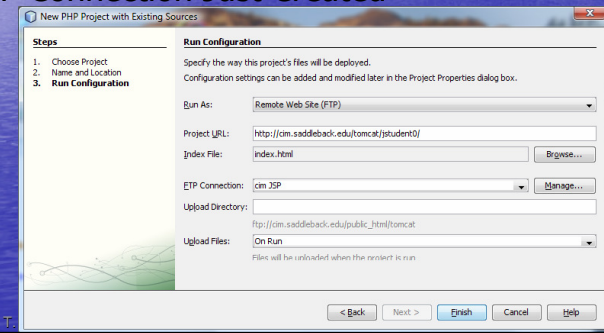
- Manage FTP Connection
 - Can Have One CIM Connection (Separate Folders)
- Use Your Username SB Username and Password StudentID
- Test



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Complete Run Configuration

- Enter your Tomcat URL
 - <http://cim.saddleback.edu/tomcat/SBUsername>
- Use FTP Connection Just Created



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NetBeans Create fruitSelect.jsp

- New → File
 - Categories: Other
 - File Type : Empty File
 - File Name: recursive.jsp
- <%@ page import="java.sql.*" %>
 - NetBeans Pause on <%
 - First Line in File

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Modify fruitSelect.jsp

- Follow fruitSelect.java
 - Load JDBC Driver
 - Define URL Connection
 - Establish Connection
 - Create Statement/Send Query/Process Results
 - Close Connection
- System.out.println → out.println(...)
- Also Your Output is DHTML not Text
 - Can Always Use <pre> Preformatted Tags

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```
<%@page import="java.sql.*" %>
<%
String driver = "com.mysql.jdbc.Driver";
String url = "jdbc:mysql://localhost/fruit";
Connection connect = (Connection)null;

try {
    Class.forName( driver ); //Also MySQL Class Path
    connect = DriverManager.getConnection( url, "userJoe", "cs4b" );
}
catch( Exception e )
{ out.println( "unable to make connection " + e.getMessage() ); out.close( ); }

Statement statement = (Statement)null;    ResultSet result = (ResultSet)null;

try {
    statement = connect.createStatement( );
    out.print( "Sending Query select * from fruit <hr />" );
    result = statement.executeQuery( "select * from fruit" );
    int columns = (result.getMetaData()).getColumnCount();

    out.print( "<pre>" );
    while( result.next() ) {
        for( int i = 1; i <= columns; ++i )
            out.print( result.getObject(i) + "\t" );
        out.println( );
    }
    out.print( "</pre>" );
}
catch( Exception e ) { out.println( "Error in query " + e.getMessage() ); }
finally { result.close(); statement.close(); connect.close(); }
```

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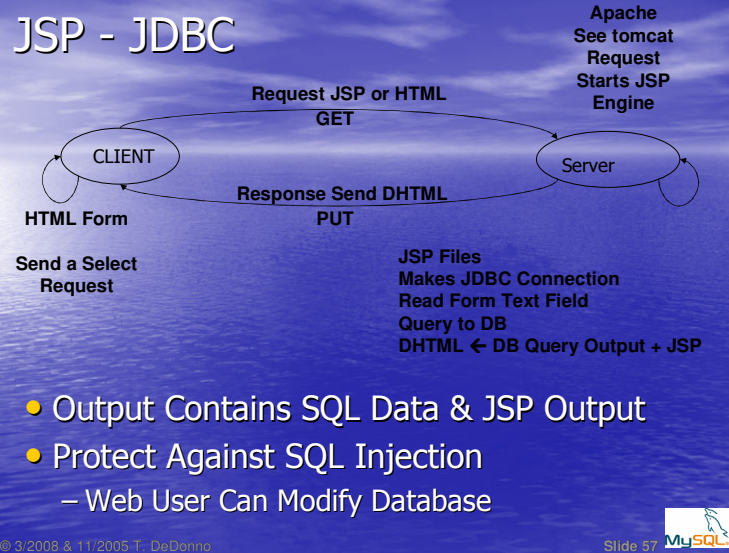


fruitSelect.jsp

Create recursive.jsp

Recursive Web Page – Page That Calls Itself
Form Block with Text Field
<form action="" method="get">
input type="text" name="query">

JSP - JDBC



Edit recursive.jsp

- Drag and Drop HTML Form
 - `<form action="" method="get">`
 - Action is the URL to Load on Submit
 - Method=get Get Form Data with URL Action Query
 - Drag and Drop Text Input
 - `<input type="text" name="query" />`
 - With one Text Fields
 - Submit Button is Optional
 - Enter will Submit the File
 - Test File Check for URL on Enter
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```
<form action="" method="get"> recursive.jsp
  Enter Your Select Query:
  <input type="text" name="query" value="" />
</form>
<hr />

<%

String query = request.getQueryString( );
if( query == (String)null || query.indexOf("query") == -1 ) {
    out.print( "No query " );
    out.close( );
}

//Don't Call request.getParameter w/out above check
query = request.getParameter( "query" );

out.println( "Query enter was: " + query );

%>
```

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JSP Script Read Request

- Use Implicit JSP Object request
 - Client has Made a request
 - `request.getParameter("FormName");`
 - Return Contents of Form Data
 - If request is missing This is Crashing Tomcat
 - But 1st Check for `request.getQueryString()`
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fruitInterface.jsp

- Modify recursive.jsp
 - Send Form Value for input Field query
- Load JDBC Driver
- Define URL Connection
- Establish Connection
- Create Statement/Send Query/Process Results
- Close Connection

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fruitInterface.jsp

```
<%@page import="java.util.Enumeration" %>
<%
String btns[][] = { {"Fruit Contents", "Select * from Fruit" },
                  {"Describe Fruit", "describe fruit" } }; %>

<form action="" method="get">
Enter Your Select Query: <input type="text" name="query" value="" />
<input type="submit" value="Submit" />
<%
for( int i = 0; i < btns.length; ++i )
    out.println( "<input type='submit' name='queryBTN' value='\"
+ btns[i][0] + \"' />" );
%>
</form><hr />

<%
if( request.getQueryString() == (String)null )
    { out.print( "No Form Data Present " ); out.close( ); }

Enumeration e = request.getParameterNames( );

while( e.hasMoreElements() ) {
String key = (String)e.nextElement( );
out.println( key + " Has Value " + request.getParameter( key ) + "<br />" );
}
%>
```

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Adding Advance Features

- 2-D Array String
 - Button Label, Query
- Submit Button
 - Label/Value is Advance Query
- Hidden Field – Form – Submit
 - Value is Advance Query

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JavaBeans – JSP Classes

- Previous Code Should be A Class
- Init Database
 - Load drive, Connect, Create Statement
- PrintQuery Method
 - Send and Process Query
- Will Do this Later on, [PHP Examples](#)

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JavaBeans

JavaBean

- Reusable Software Component
 - All GUI Elements are Beans
 - JSP has XML Tag `<jsp:usebean ... />`
 - Creates Class Object w Scope
- JavaBean Requirements...
 - Class is Public
 - Has a null Constructor
 - implement Serializable
- JavaBean can have...
 - Mutator/Accessors get & set Prefix, is for Boolean
 - Register & De-Register – Listener, Bean is a Listener

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JavaBean Access Locations JSP & CIM Specifically

- Must Specify Package (default Location)
 - First Line in Java Program
 - `package SBUserName;`
 - Default Location is `WEB-INF/classes/SBUserName`
- Default Folder `WEB-INF/classes/JavaBeanClasses`
- For CIM
- JSP Home Folder...
 - `WEB-INF/classes/SBUsername`
- First Line in all JavaBeans is...
 - `package SBusername;`

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```
package jstudent0;

/* Compile to
   javac -d WEB-INF/classes SimpleBean.java
   Output is WEB-INF/classes/jstudent0/SimpleBean.class
*/
import java.io.Serializable;
public class SimpleBean implements Serializable {
```

```
    private String msg;
```

SimpleBean.java

```
    public SimpleBean( )
    {
        msg = "Hello CS4B";
    }
```

```
    public String getmsg( ) { return msg; }
    public void setmsg( String s ) { msg = s; }
}
```

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<jsp:useBean id="objectName"...

- <tagPrefix:tagName Attributes
- <jsp:useBean id="simple" class="jstudent0.SimpleBean" ... />
 - (aka) jstudent0.SimpleBean simple = new jstudent0.SimpleBean();
 - But a Bean has a Scope in a Servlet + JSP Tags for Properties
- <jsp:useBean id="s..." class="j..." scope=" [page|session|application]"
- Scope of the Bean in the Specific Servlet, JSP → Java Servlet
 - Page – On a Specific Web Page Only
 - Session – Specific Web Browser
 - Start up Firefox (Session Begins) Exit Firefox Session Ends
 - Create a Session Cookie
 - Each Browser has its Own Cookies
 - Application – Tomcat Application Level
 - Will Look at These Scopes Later on

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```
<html>
<head> cim/tomcat/jstudent0/SimpleBean.jsp
<title>Simple Bean Test</title>

<jsp:useBean id="simple" class="jstudent0.SimpleBean"
             scope="page" />
// useBean is a class with a scope,
// and uses java.Beans.Bean instantiation
// jstudent0.SimpleBean simple = new jstudent0.SimpleBean( );
<body>

<% out.print( "Mesg is " + simple.getmsg( ) ); %>
<hr />
<jsp:setProperty name="simple" property="msg"
                 value="Summer is Near, But Casino is Real" />
<jsp:getProperty name="simple" property="msg" />

<hr /></body></html>
```

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Compiling & Using JavaBean

- Standard java Compile
 - But with Class Path Identifier
 - Javac -d WEB-INF/classes
 - -d Directory to Place Class Files
 - NetBeans Does This Automatically
- <jsp:usebean id="object" class="path" />
- Easier to do this with NetBeans

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NetBeans

Java Web Application
JSP Page & JavaBean Components

NetBeans Web Application Configure

- File → New Project
- Java Web → Web Application
- Name and Location Up to You
- Server and Settings GlassFish V3
 - Context Path: <http://localhost:8080/contextPath/>
 - Could Entered /tomcat/jstudent0 So It Matches CIM
 - Can Also Leave it Blank
- Frameworks - None

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Testing Local Web Applications

- Geared For Local Testing
- GlassFish Comes w Netbeans
 - Tomcat is Part of Glass Fish
 - To Test Database Locally You need To Implement Java DB Derby part of Glassfish 2.0
 - Assignment Has a [Derby Netbeans Tutorial](#)
 - NetBeans Restarts GlassFish on Each Run
- Once GlassFish Starts Locally
 - Use Browser to Reload Local File

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FTP

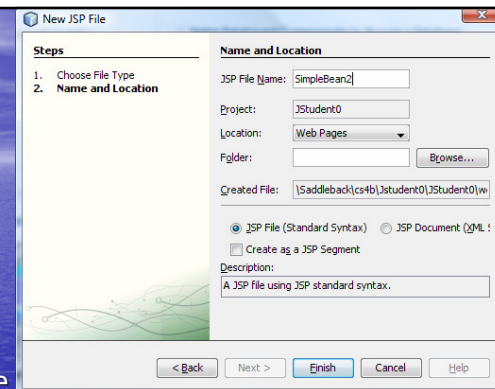
- Use FileZilla to FTP to cim
- FTP build Files to CIM-Tomcat Home Folder
 - build Folder: *.jsp & WEB-INF/classes/SBusername
 - build is a SubFolder inside your NetBeans Project
 - Folder is Not Visible in NetBeans
- Remote URL, Folder
<http://cim.saddleback.edu/tomcat/SBUsername>
Folder public_html/tomcat (for JSP)
public_html/tomcat/WEB-INF/classes/SBusername

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Create JSP File

- Right^Click Folder Web Pages
 - New → JSP
 - Enter JSP File Name Extension is Added
- Click Finish, JSP File is Created



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Default Created File


```

<%--
  Document   : SimpleBean2
  Created on : Apr 15, 2009, 9:37:31 PM
  Author    : tdedonno
--%>

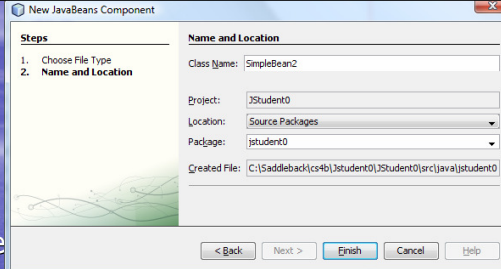
<%@page contentType="text/html" pageEncoding="UTF-8"%>
<!DOCTYPE HTML PUBLIC "-//W3C//DTD HTML 4.01 Transitional//EN"
"http://www.w3.org/TR/html4/loose.dtd">

<html>
<head>
  <meta http-equiv="Content-Type"
    content="text/html; charset=UTF-8">
  <title>JSP Page</title>
</head>
<body>
  <h1>Hello World!</h1>
</body>
</html>


```

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Create JavaBean



- Right^Click Source Package
 - New → JavaBean Component
 - Enter JavaBean Class Name : SimpleBean2
 - Also Enter Package: SBUserName
- NetBeans Automatically Creates Correct Folder
 - On Build Project or Run-File
 - *.class is Created in build/web/WEB-INF/classes
 - NetBeans Doesn't Display this Folder

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SimpleBean2.java

After Replace sampleProperty → msg

```

package jstudent0;

import java.beans.*;
import java.io.Serializable;

/**
 * @author tdedonno
 */
public class SimpleBean2 implements Serializable {

  public static final String PROP_SAMPLE_PROPERTY = "Hello CS4B";

  private String msg;


  private PropertyChangeSupport propertySupport;

  public SimpleBean2() {
    propertySupport = new PropertyChangeSupport(this);
  }

  public String getmsg() {
    return msg;
  }

  public void setmsg(String value) {

```

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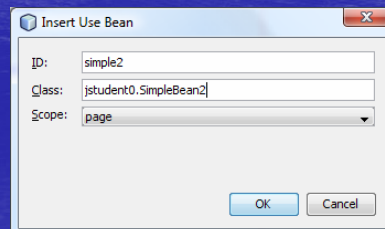
Compiling/Building

- Right^Click Compile File
 - Automatically Added to build class Folder
- Run → Build Etc
 - It also Automatically Creates Class File
- On Build Netbeans Also Creates *.jar and *.war Files
 - But for CIM is will be Just Class Files

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Create Object in JSP

- Make Sure Palette is Open
 - Window → Palette if Not Available
- In HTML Head Block, Drag & Drop UseBean
 - Make Sure SimpleBean2 has Been Compiled
 - May Need to Build First
- Need to Type Full Class Name



Insert Use Bean

ID: simple2

Class: jstudent0.SimpleBean2

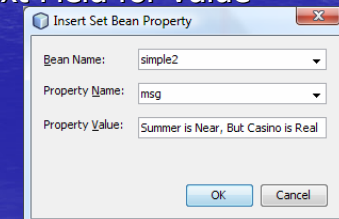
Scope: page

OK Cancel

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Get, Set and Get Property

- Drop and Drop Get Bean Property
 - Your Bean Name is at End of Implicit Objects
 - Select, simple2 and Then Property Name
 - For simple2 we Only one Property
- Set Bean Property – Text Field for Value
- Remember simple2 is Your Object Name



Insert Set Bean Property

Bean Name: simple2

Property Name: msg

Property Value: Summer is Near, But Casino is Real

OK Cancel

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Testing JSP Files

- Project Panel (Right^Click Run-File)
 - Re-starts/Starts up GlassFish,
 - Executes JSP
- Run → Run Main Project
 - Execute index.jsp File
 - Can Add Links to Other Files
- Once GlassFish is Started its Best to
 - Save Files in Netbeans
 - Reload in Browser

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Fruit Interface Assignment


- Create JavaBean, Connect to Database
- Have Method with Argument String Query
 - Output a String From Query Result
 - Or use J2EE class javax.servlet.jsp.JspContext
 - Or Pass implicit Object out
 - You don't have implicit Objects in Beans
- Goal Fairly Sophisticated
 - Consult PHP Examples Under Assignment

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java.util.regex


Checking Input Using Regular Expressions


- ## Checking Input Query
- `java.lang.String.matches(String regex)`
 - True on Regular Expression Match
 - `java.util.regex.[Matcher | Pattern]`
 - Static Method `java.util.regex.Pattern.matches("^a.*", "abc");`
 - All Major Programming Languages RegEx
 - JavaScript, Java2 Version 1.4, Perl, PHP
 - Standard C.S. RegEx Definition
 - Derived from Unix-Awk-Grep
 - Regular Expression Help Part of Java API
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RegExp Meta Character

.	Any Character	\d	Digit
+	One or more ab+ Ab or abb	\D	Not Digit
*	Zero or more ab+ a ab abb	\s	Single White Space
	Or abc xyz	\S	Non white Space
{n}	Repeat A{2} need AA	\w	Letter, number or Underscore, Var Identifier
^	Beginning of Line	[a-z]	Set a to z
\$	End of Line	[^a-z]	Not in Set a to z

Match a Name `“^[A-Z][a-z]*$”`
 Would Match: T, Tom, Saddleback,
 But Would Not Match: tom, ToM, Tom1

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- ## RegExp Examples
- `“^t”` matches string only with starting t
 - `“^t.*”` matches string start with t
 - `“^[A-Z]”` match lines with only a Capital Letter
 - `“^[A-Z][a-z]+”`
 - Match Lines initial Capital Letter & Second lower case Letter
 - Azzz is okay
 - `“^[A-Z][a-z]$”`
 - initial Capital Letter then only one lower case
 - Az is okay; but Azz is not okay
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What is the Output...

Assume its Correctly Inside JSP Page

```
out.print( "<pre>" );
out.println( "REG EX ^a a :"
    + Pattern.matches( "^a", "a" ) );
out.println( "REG EX ^a. abc :"
    + Pattern.matches( "^a.*", "abc" ) );
out.println( "REG EX ^Aa Aaaa :"
    + Pattern.matches( "^Aa", "Aaaa" ) );
out.println( "REG EX ^[A-Z][a-z]* Tom :"
    + "Tom".matches( "[A-Z][a-z]*" ) );
out.println( "REG EX ^[A-Z][a-z]+ ToM :"
    + "ToM".matches( "[A-Z][a-z]*" ) );
out.print( "</pre>" );
```

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RE Quiz...

- What would this match? `^20\d{2}$`;
- `Str.match("^t");` returns True When?
- `^1[1-9]$` Tests for?
- `^[Ss][eE]` Test for

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