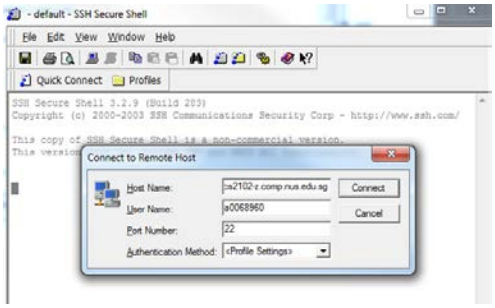
CS2102 Database Systems
AY 2014/2015 Semester I

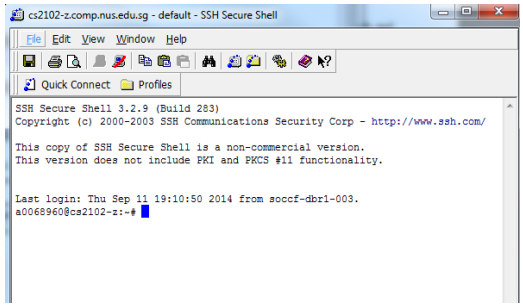
PHP Lab Handout

Relational DBMS supports an interactive SQL interface where users can directly enter SQL commands. In practice, we often encounter situations where we need the flexibility of a general purpose programming language in addition to the data manipulation facilities provided by SQL. For example, we may want to integrate a database application with a nice graphical user interface, or other existing applications.

PHP is a server-side, HTML embedded scripting language. It is used to program active Web pages. An HTML page contains PHP code inside the <?php> tags. This code is executed by the server before the page is delivered to the client. You can use PHP to access your database. This lab handout provides the basic steps to create a PHP file that interacts with the Oracle database in your zone account. You can learn more about HTML and PHP at http://www.w3schools.com/html/ and http://www.w3schools.com/php/

1. **Login to zone account**
   - Launch (double click) the application "SshClient.exe" in the lab desktop[1].
   - Click on the button "Quick Connect" on the toolbar of the application.
   - Input the below information in the pop-up dialog, and press button "Connect"
     - ❖ Hostname: cs2102-z.comp.nus.edu.sg
     - ❖ Username: your nusnet id
     - ❖ Password: crse1410 (by default)
   - You are now logged in the command shell of the zone account.



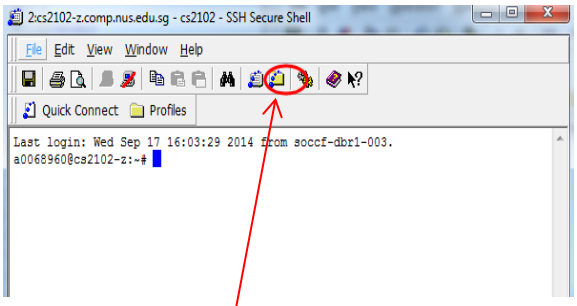


2. **Create a PHP file called Book.php** that contains the following HTML code to design the user interface and widgets (buttons, drop-down menu etc.) of the web application.

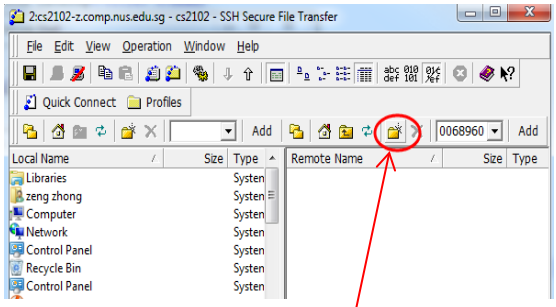
[1] If you want to use your own machine, please install the software SSH Secure Shell (SSHClient) and connect to the SoC network first.

```
<html>
<head> <title>Demo Online Book Catalog</title> </head>

<body>
<table>
<tr> <td colspan="2" style="background-color:#FFA500;">
<h1> Demo Book Catalog</h1>
</td> </tr>

<tr>
<td style="background-color:#eeeeee;">
<form>
      Title: <input type="text" name="Title" id="Title">

      <select name="Language"> <option value="">Select Language</option> </select>

      <input type="radio" name="Format" id="Format1" value="hardcover">hardcover
      <input type="radio" name="Format" id="Format2" value="paperback">paperback

      <input type="submit" name="formSubmit" value="Search" >
</form>
</td> </tr>

<tr>
<td colspan="2" style="background-color:#FFA500; text-align:center;"> Copyright &#169; CS2102
</td> </tr>
</table>

</body>
</html>
```

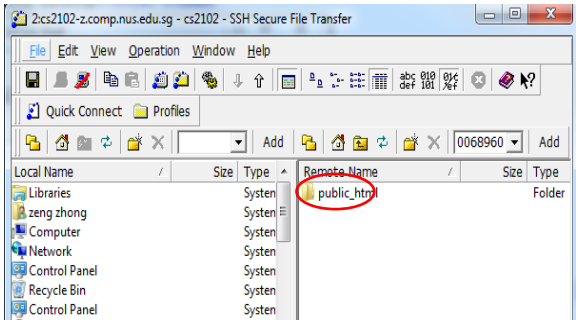
- You can use Notepad in the desktop PC to create the file, and upload it to your zone account via the SSH Secure Shell File Transfer Window. Put the file Book.php in the directory public_html in your zone account. Create the directory if it does not exist.

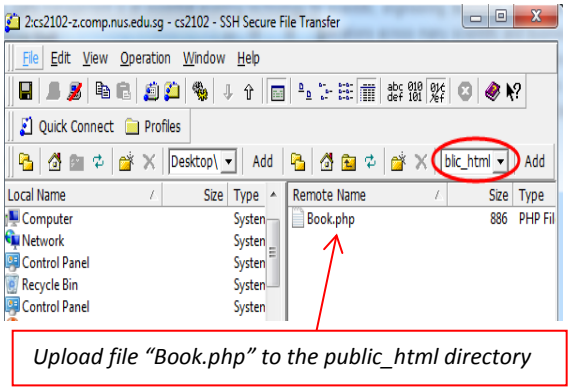


Click to launch File Transfer Window



Click to create "public_html" directory in your zone account





- Now you can run the code in your web browser by typing

  http://cs2102-z.comp.nus.edu.sg/~your nusnet id/Book.php

3. The above pure HTML code in Book.php does not access the Oracle database to retrieve book information. PHP scripts are needed to interact with the database. **Now add PHP codes to connect to your Oracle database, execute an SQL statement and display the results**. The following code highlights the embedded PHP scripts.

```
<html>
<head> <title>Demo Online Book Catalog</title> </head>
<body>
<table>
<tr> <td colspan="2" style="background-color:#FFA500;">
<h1> Demo Book Catalog</h1>
</td> </tr>

<?php
putenv('ORACLE_HOME=/oraclient');
$dbh = ocilogon('your nusnetid', 'crse1410(by default)', sid3);
?>

<tr> <td style="background-color:#eeeeee;">
<form>
    Title: <input type="text" name="Title" id="Title">
    <select name="Language"> <option value="">Select Language</option> </select>
    <input type="radio" name="Format" id="Format1" value="hardcover">hardcover
    <input type="radio" name="Format" id="Format2" value="paperback">paperback

    <input type="submit" name="formSubmit" value="Search" >
</form>
```

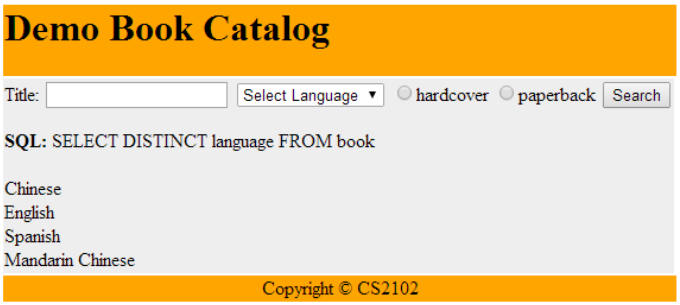
These PHP codes open a connection to the database

```
<?php if (isset ($_GET['formSubmit']))
{
        $sql = "SELECT DISTINCT language FROM book";
        $stid = oci_parse($dbh, $sql);
        oci_execute ($stid, OCI_DEFAULT);

        echo "<b>SQL: </b>".$sql."<br><br>";

        while ($row = oci_fetch_array($stid))  {
          echo  "$row[0]"."<br>";
        }

        oci_free_statement($stid);
}
?>
</td> </tr>

<?php
oci_close($dbh);
?>
<tr>
<td colspan="2" style="background-color:#FFA500; text-align:center;"> Copyright &#169; CS2102
</td> </tr>
</table>

</body>
</html>
```

These PHP codes execute an SQL query to retrieve the languages from the Book table when you click on the Search button.

These PHP codes close the connection to the database.

Below is the screenshot if you run the above code in your web browser:



4. We can **use the results from your query to create a drop-down menu in html**. The following code demonstrates how this is done.

```
<html>
<head> <title>Demo Online Book Catalog</title> </head>
<body>
<table>
<tr> <td colspan="2" style="background-color:#FFA500;">
<h1> Demo Book Catalog</h1>
</td> </tr>
```

```
<?php
putenv('ORACLE_HOME=/oraclient');
$dbh = ocilogon('your nusnetid', 'crse1410(by default)', sid3);
?>

<tr> <td style="background-color:#eeeeee;">
<form>
      Title: <input type="text" name="Title" id="Title">
      <select name="Language"> <option value="">Select Language</option>
      <?php
            $sql = "SELECT DISTINCT language FROM book";
            $stid = oci_parse($dbh, $sql);
            oci_execute($stid, OCI_DEFAULT);

            while($row = oci_fetch_array($stid)){
                  echo "<option value=\"".$row["LANGUAGE"]."\">".$row["LANGUAGE"]."</option><br>";
            }
            oci_free_statement($stid);
       ?>
       </select>
      <input type="radio" name="Format" id="Format1" value="hardcover">hardcover
      <input type="radio" name="Format" id="Format2" value="paperback">paperback

      <input type="submit" name="formSubmit" value="Search" >
</form>

</td> </tr>
<?php
oci_close($dbh);
?>
<tr> <td colspan="2" style="background-color:#FFA500; text-align:center;"> Copyright &#169; CS2102
</td> </tr>
</table>
</body>
</html>
```

These PHP codes create options for the dropdown menu based on the result of the query.

Screenshot of the above code:

5. Finally, we can also **construct an SQL query from user input in the widgets** (text box, dropdown menu, radio button). The query is executed when the user clicks on the Search button. The following code displays the results of the constructed query in a table.

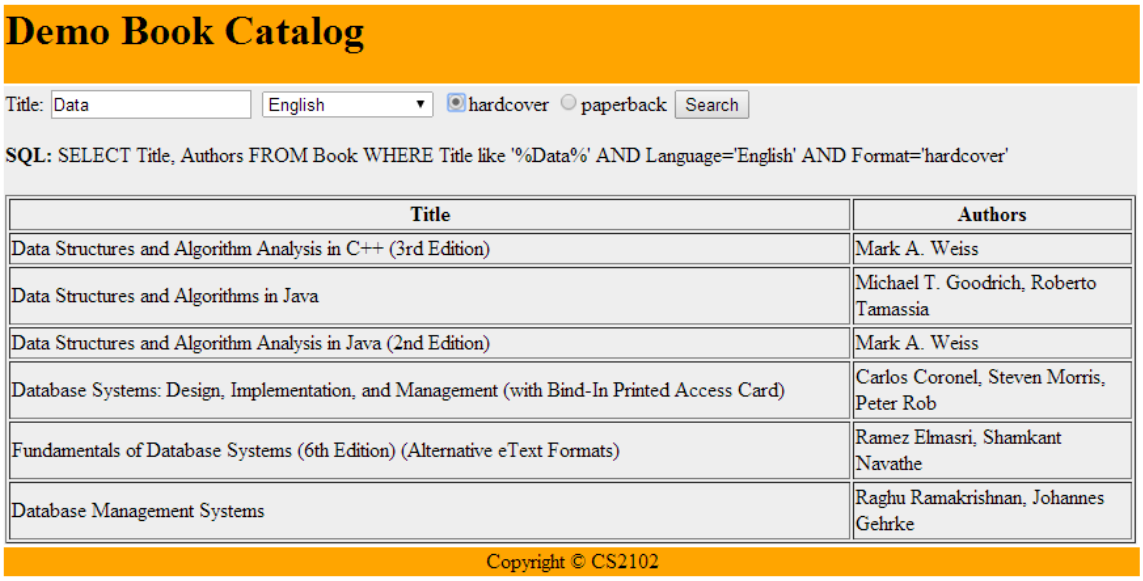
```
<html>
<head> <title>Demo Online Book Catalog</title> </head>
<body>
<table>
<tr> <td colspan="2" style="background-color:#FFA500;">
<h1> Demo Book Catalog</h1>
</td> </tr>

<?php
putenv('ORACLE_HOME=/oraclient');
$dbh = ocilogon('your nusnetid', 'crse1410(by default)', sid3);
?>

<tr> <td style="background-color:#eeeeee;">
<form>
      Title: <input type="text" name="Title" id="Title">
      <select name="Language"> <option value="">Select Language</option>
      <?php
            $sql = "SELECT DISTINCT language FROM book";
            $stid = oci_parse($dbh, $sql);
            oci_execute($stid, OCI_DEFAULT);
            while ($row = oci_fetch_array($stid)) {
                  echo "<option value=\"".$row["LANGUAGE"]."\">".$row["LANGUAGE"]."</option><br>";
            }
            oci_free_statement($stid);
       ?>
       </select>
      <input type="radio" name="Format" id="Format1" value="hardcover">hardcover
      <input type="radio" name="Format" id="Format2" value="paperback">paperback
      <input type="submit" name="formSubmit" value="Search" >
</form>
<?php

If (isset ($_GET['formSubmit']))  {
            $sql = "SELECT Title, Authors FROM Book WHERE Title like '%".$_GET['Title']."%' AND
                        Language='".$_GET['Language']."' AND Format='".$_GET['Format']."'";
            echo "<b>SQL:   </b>".$sql."<br><br>";
            $stid = oci_parse($dbh, $sql);
            oci_execute($stid, OCI_DEFAULT);
            echo "<table border=\"1\" >
            <col width=\"75%\"> <col width=\"25%\">
            <tr>
            <th>Title</th> <th>Authors</th>
            </tr>";

            while ($row = oci_fetch_array($stid))  {
              echo "<tr>";
              echo "<td>" . $row[0] . "</td>";
              echo "<td>" . $row[1] . "</td>";
              echo "</tr>";
            }
            echo "</table>";
            oci_free_statement($stid);
}
?>
```

Obtain user input in widgets

Display the result of query in a table

```
</td> </tr>
<?php
oci_close($dbh);
?>
<tr>
<td colspan="2" style="background-color:#FFA500; text-align:center;"> Copyright &#169; CS2102
</td> </tr>
</table>

</body>
</html>
```

Screenshot of the above code:



Demo Book Catalog

Title: Data English hardcover paperback Search

SQL: SELECT Title, Authors FROM Book WHERE Title like '%Data%' AND Language='English' AND Format='hardcover'

Title	Authors
Data Structures and Algorithm Analysis in C++ (3rd Edition)	Mark A. Weiss
Data Structures and Algorithms in Java	Michael T. Goodrich, Roberto Tamassia
Data Structures and Algorithm Analysis in Java (2nd Edition)	Mark A. Weiss
Database Systems: Design, Implementation, and Management (with Bind-In Printed Access Card)	Carlos Coronel, Steven Morris, Peter Rob
Fundamentals of Database Systems (6th Edition) (Alternative eText Formats)	Ramez Elmasri, Shamkant Navathe
Database Management Systems	Raghu Ramakrishnan, Johannes Gehrke

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