Lab Session 8: HTML, PHP and MySQL

The content of a Web page can be either statically or dynamically generated. In this lab we will look at both ways of generating HTML. We will start with static HTML code, and then we will develop some PHP scripts to generate HTML dynamically.

We are going to connect to the database system, so that we obtain the actual contents of tables, insert new records into a table and make changes to existing records.

Part I: Listing the accounts

1. The following code is for a static HTML page that shows the contents of table *account*.

```html
<html>
    <body>
        <h3>Table <em>account</em> (version 1)</h3>
        <table border="1">
            <tr>
                <td><em>account_number</em></td>
                <td><em>branch_name</em></td>
                <td><em>balance</em></td>
            </tr>
            <tr><td>A-101</td><td>Downtown</td><td>500</td></tr>
            <tr><td>A-102</td><td>Perryridge</td><td>400</td></tr>
            <tr><td>A-201</td><td>Brighton</td><td>900</td></tr>
            <tr><td>A-215</td><td>Mianus</td><td>700</td></tr>
            <tr><td>A-217</td><td>Brighton</td><td>750</td></tr>
            <tr><td>A-222</td><td>Redwood</td><td>700</td></tr>
            <tr><td>A-305</td><td>Round Hill</td><td>350</td></tr>
        </table>
    </body>
</html>
```

1. Save this code in a file called **accounts1.php** on your local machine.

2. Use an SFTP client (such as **WinSCP** or **FileZilla**) to open your home directory on sigma.ist.utl.pt. Use the following login info:
    *   Host: sigma.ist.utl.pt | Port: 22
    *   Username: (your username of Fénix)
    *   Password: (your password of Fénix)

3. Locate the folder "web" inside your home directory. This is where you should put your HTML pages and/or PHP scripts.

4. Move or copy the file **accounts1.php** into your "web" folder.

5. Open the Web browser on your local machine and navigate to:
    http://web.ist.utl.pt/istxxxxxx/accounts1.php
    where **istxxxxxx** is to be replaced by your username.

6. You should see the following content appearing in your Web browser:

    Table *account* (version 1)

account_number	branch_name	balance
A-101	Downtown	500
A-102	Perryridge	400
A-201	Brighton	900
A-215	Mianus	700
A-217	Brighton	750
A-222	Redwood	700
A-305	Round Hill	350

7. Right-click somewhere on the Web page and select "View Page Source". Confirm that the HTML code that was sent to the Web browser is the same as what you have written in **accounts1.php**.

8. We are going to change this page so that the same content is generated dynamically from a PHP array. For that purpose, we will use the following PHP script:

```
<html>
    <body>
        <h3>Table <em>account</em> (version 2)</h3>
        <table border="1">
            <tr>
                <td><em>account_number</em></td>
                <td><em>branch_name</em></td>
                <td><em>balance</em></td>
            </tr>
<?php

    $accounts[0] = array('A-101', 'Downtown', 500);
    $accounts[1] = array('A-102', 'Perryridge', 400);
    $accounts[2] = array('A-201', 'Brighton', 900);
    $accounts[3] = array('A-215', 'Mianus', 700);
    $accounts[4] = array('A-217', 'Brighton', 750);
    $accounts[5] = array('A-222', 'Redwood', 700);
    $accounts[6] = array('A-305', 'Round Hill', 350);

    for ($i = 0; $i < count($accounts); $i++)
    {
        echo("<tr>");
        for ($j = 0; $j < count($accounts[$i]); $j++)
        {
            echo("<td>{$accounts[$i][$j]}</td>");
        }
        echo("</tr>\n");
    }

?>
        </table>
    </body>
</html>
```

9. Note the following things about the script above:
   - This code is a mix of static and dynamic content. The dynamic content is being generated inside the PHP tags **<?php** and **?>**. Everything else outside those tags is static content.
   - The accounts are being placed in an array called **$accounts**. There are 7 accounts and these are being placed in consecutive positions of the array, starting at position 0.
   - Each account is also an array, and each of these arrays has 3 elements: an account number, a branch name, and a balance. Therefore, **$accounts** is actually an array of arrays. In PHP, this is called a *multidimensional array*.
   - In the first **for** loop, we are using **count($accounts)** to get the number of accounts in the array. The variable **$i** will go from 0 to 6. Each account can be accessed as **$accounts[$i]**.
   - In the second **for** loop, we are using **count($accounts[$i])** to get the number of data elements inside each account. The variable **$j** will go from 0 to 2. Each data element can be accessed as **$accounts[$i][$j]**.
   - Inside the second **for** loop, there is the instruction **echo("<td>{$accounts[$i][$j]}</td>")**. Note the use of curly braces inside the string. This is necessary for PHP to know that we want to print **$accounts[$i][$j]** and not **$account[$i]** followed by **$j** in square brackets.
   - Some **echo()** calls have a newline (**\n**) at the end of the string. This has not effect on what the Web browser will show. However, if you select "View Page Source" you will see that the HTML code has those line breaks.

10. Save the code above in a file called **accounts2.php** on your local machine.

11. Using an SFTP client as you did before, move or copy the file **accounts2.php** to your "web" folder on sigma.ist.utl.pt.

12. Open the Web browser on your local machine and navigate to:
    http://web.ist.utl.pt/istxxxxxx/accounts2.php
    where **istxxxxxx** is to be replaced by your username.

13. You should see the following table appearing in your browser:

Table *account* (version 2)

account_number	branch_name	balance
A-101	Downtown	500
A-102	Perryridge	400
A-201	Brighton	900
A-215	Mianus	700
A-217	Brighton	750
A-222	Redwood	700
A-305	Round Hill	350

14. Right-click somewhere on the Web page and select "View Page Source" to view the HTML code that was sent to the Web browser. This HTML code has been dynamically generated by the PHP script.

15. In the previous example we have used an array **$accounts** indexed by position **$i**. Now we will change that to an *associative array*, meaning that the array will be indexed by a key. In this case, the key is the account number.

```
<html>
    <body>
        <h3>Table <em>account</em> (version 3)</h3>
        <table border="1">
            <tr>
                <td><em>account_number</em></td>
                <td><em>branch_name</em></td>
                <td><em>balance</em></td>
            </tr>
<?php

    $accounts['A-101'] = array('Downtown', 500);
    $accounts['A-102'] = array('Perryridge', 400);
    $accounts['A-201'] = array('Brighton', 900);
    $accounts['A-215'] = array('Mianus', 700);
    $accounts['A-217'] = array('Brighton', 750);
    $accounts['A-222'] = array('Redwood', 700);
    $accounts['A-305'] = array('Round Hill', 350);

    foreach ($accounts as $account_number => $account)
    {
        echo("<tr>");
        echo("<td>$account_number</td>");
        for ($j = 0; $j < count($account); $j++)
        {
            echo("<td>{$account[$j]}</td>");
        }
        echo("</tr>\n");
    }

?>
        </table>
    </body>
</html>
```

16. In the code above, note the following:
    - **$accounts** is an associative array indexed by account numbers.
    - The first loop is now a **foreach** loop which goes through all key-value pairs. For each pair, key is stored in the variable **$account_number** and the value is stored in the variable **$account**. Note that the value associated with the key is an array.
    - The second loop is still a **for** loop that goes through all the data elements in each account. However, now there are only two data elements: branch name and balance.

17. Save the code above in a file called **accounts3.php** on your local machine.

18. Using an SFTP client, move or copy the file **accounts3.php** to your "web" folder on sigma.ist.utl.pt

19. Open the Web browser on your local machine and navigate to:
    http://web.ist.utl.pt/istxxxxxx/accounts3.php
    where **istxxxxxx** is to be replaced by your username.

20. You should see the following table appearing in your browser:

Table *account* (version 3)

account_number	branch_name	balance
A-101	Downtown	500
A-102	Perryridge	400
A-201	Brighton	900
A-215	Mianus	700
A-217	Brighton	750
A-222	Redwood	700
A-305	Round Hill	350

21. Right-click somewhere on the Web page and select "View Page Source" to view the HTML code that was sent to the Web browser. This HTML code has been dynamically produced by the PHP script.

22. Now we will turn each account also into an associative array. For this purpose, we will use the following PHP script:

```
<html>
    <body>
        <h3>Table <em>account</em> (version 4)</h3>
        <table border="1">
            <tr>
                <td><em>account_number</em></td>
                <td><em>branch_name</em></td>
                <td><em>balance</em></td>
            </tr>
<?php

    $accounts['A-101'] = array('branch_name' => 'Downtown', 'balance' => 500);
    $accounts['A-102'] = array('branch_name' => 'Perryridge', 'balance' => 400);
    $accounts['A-201'] = array('branch_name' => 'Brighton', 'balance' => 900);
    $accounts['A-215'] = array('branch_name' => 'Mianus', 'balance' => 700);
    $accounts['A-217'] = array('branch_name' => 'Brighton', 'balance' => 750);
    $accounts['A-222'] = array('branch_name' => 'Redwood', 'balance' => 700);
    $accounts['A-305'] = array('branch_name' => 'Round Hill', 'balance' => 350);

    foreach ($accounts as $account_number => $account)
    {
        echo("<tr>");
        echo("<td>$account_number</td>");
        echo("<td>{$account['branch_name']}</td>");
        echo("<td>{$account['balance']}</td>");
        echo("</tr>\n");
    }

?>
        </table>
    </body>
</html>
```

23. In the code above, note the following:
   - Each element in the associative array **$accounts** is itself an associative array with two keys: branch name and balance.
   - The second loop has disappeared and instead we just print the values associated with those two keys. Note the use of curly braces in the **echo()** instructions.

24. Save the code above in a file called **accounts4.php** on your local machine.

25. Using an SFTP client, move or copy the file **accounts4.php** to your "web" folder on sigma.ist.utl.pt.

26. Open the Web browser on your local machine and navigate to:
http://web.ist.utl.pt/istxxxxxx/accounts4.php
where **istxxxxxx** is to be replaced by your username.

27. You should see the following table appearing in your browser:

Table *account* (version 4)

account_number	branch_name	balance
A-101	Downtown	500
A-102	Perryridge	400
A-201	Brighton	900
A-215	Mianus	700
A-217	Brighton	750
A-222	Redwood	700
A-305	Round Hill	350

28. Right-click somewhere on the Web page and select "View Page Source" to view the HTML code that was sent to the Web browser. This HTML code has been dynamically produced by the PHP script.

29. In the previous examples, we have used a **for** or a **foreach** loop to iterate through the array **$accounts**. In this example, we will use an iterator and the special functions **reset()**, **current()**, and **next()**. Have a look at the following PHP script:

```html
<html>
    <body>
        <h3>Table <em>account</em> (version 5)</h3>
        <table border="1">
            <tr>
                <td><em>account_number</em></td>
                <td><em>branch_name</em></td>
                <td><em>balance</em></td>
            </tr>
<?php

    $accounts = array(
        array('account_number' => 'A-101', 'branch_name' => 'Downtown', 'balance' => 500),
        array('account_number' => 'A-102', 'branch_name' => 'Perryridge', 'balance' => 400),
        array('account_number' => 'A-201', 'branch_name' => 'Brighton', 'balance' => 900),
        array('account_number' => 'A-215', 'branch_name' => 'Mianus', 'balance' => 700),
        array('account_number' => 'A-217', 'branch_name' => 'Brighton', 'balance' => 750),
        array('account_number' => 'A-222', 'branch_name' => 'Redwood', 'balance' => 700),
        array('account_number' => 'A-305', 'branch_name' => 'Round Hill', 'balance' => 350)
    );

    reset($accounts);
    $account = current($accounts);
    while ($account)
    {
        echo("<tr>");
        echo("<td>{$account['account_number']}</td>");
        echo("<td>{$account['branch_name']}</td>");
        echo("<td>{$account['balance']}</td>");
        echo("</tr>\n");
        $account = next($accounts);
    }

?>
        </table>
    </body>
</html>
```

30. In the code above, note the following:
   - The array **$accounts** is being initialized with the function **array()**. However, this is an array of arrays, so each element in the array **$accounts** is itself an array that is also initialized with the function **array()**.
   - The function **reset()** sets the internal pointer of the array to its first element.
   - The function **current()** returns the current element in the array. Since this is being called after **reset()**, the current element in the array is the first element.
   - If the array happened to be empty, then there would be no current element. In that case, **current()** would return **FALSE**, and therefore the **while** loop would not execute.
   - Inside the **while** loop, we print a table row (**<tr>...</tr>**) and then we use the function **next()** to get the next element from the array. If there are no more elements in the array, **next()** returns **FALSE**.
   - At the end of the **while** loop, the pointer is past the end of the array. If you need to iterate through the array again, you will need to call **reset()** to go back to the first element.

31. Save the code above in a file called **accounts5.php** on your local machine.

32. Using an SFTP client, move or copy the file **accounts5.php** to your "web" folder on sigma.ist.utl.pt.

33. Open the Web browser on your local machine and navigate to:
http://web.ist.utl.pt/istxxxxxx/accounts5.php
where **istxxxxxx** is to be replaced by your username.

34. You should see the following table appearing in your browser:

Table *account* (version 5)

account_number	branch_name	balance
A-101	Downtown	500
A-102	Perryridge	400
A-201	Brighton	900
A-215	Mianus	700
A-217	Brighton	750
A-222	Redwood	700
A-305	Round Hill	350

35. Right-click somewhere on the Web page and select "View Page Source" to view the HTML code that was sent to the Web browser. This HTML code has been dynamically produced by the PHP script.

Part II: Showing the current date and time

36. In this step, we will create a different Web page to show us the current date and time. For this purpose, we will use the following PHP script:

```
<html>
    <body>
<?php
        $date = date("Y-m-d");
        echo("<p>The current date is: $date</p>\n");
        $time = date("H:i:s");
        echo("<p>The current time (on the server) is: $time</p>\n");
?>
    </body>
</html>
```

37. Save the code above in a file called **datetime1.php** on your local machine.

38. Using an SFTP client, move or copy the file **datetime1.php** to your "web" folder on sigma.ist.utl.pt.

---

39. Open the Web browser on your local machine and navigate to:
http://web.ist.utl.pt/istxxxxxx/datetime1.php
where **istxxxxxx** is to be replaced by your username.

40. You should see the date and time being displayed on the browser.

41. On your keyboard, hit F5 (refresh) repeatedly to reload the Web page, so that you see the time being updated.

42. Right-click somewhere on the Web page and select "View Page Source" to view the HTML that was sent to the Web browser.

43. Most content in the previous page is static. In fact, only the date and time are dynamic elements. In this case, it is possible to rewrite the PHP script in a simpler way:

```
<html>
    <body>
        <p>The current date is: <?= date("Y-m-d") ?></p>
        <p>The current time (on the server) is: <?= date("H:i:s") ?></p>
    </body>
</html>
```

44. In the code above, note the following:
- Almost everything is static HTML code except for the highlighted parts, which contain the PHP instructions.
- The short tag **<?=** allows printing (i.e. "echoing") the value of a PHP function or variable without the need to call **echo()**.

45. Save the code above in the file **datetime2.php**.

46. Using an SFTP client, move or copy the file **datetime2.php** to your "web" folder on sigma.ist.utl.pt.

47. Open the Web browser on your local machine and navigate to:
http://web.ist.utl.pt/istxxxxxx/datetime2.php
where **istxxxxxx** is to be replaced by your username.

48. You should see the date and time being displayed on the browser, as before.

Part III: Listing the accounts

In Part I, we have seen how to present data in the form of a HTML table. Tables were generated both statically (using pure HTML) and dynamically (using PHP).

In this Part we are going to connect to the database system, so that we obtain the actual contents of table account. We will also allow the user to insert a new account, check the balance of a specific account, and change the balance of any existing account.

While doing this, we will perform SELECT, INSERT, and UPDATE operations on the database. As an exercise, you will be asked to provide the possibility of deleting an existing account (DELETE operation).

The following code is for a PHP script that connects to the database, retrieves all entries in table account, and displays them in a HTML table.

```
<html>
    <body>
<?php
        $host = "db.tecnico.ulisboa.pt";
        $user = "istxxxxxx";
        $pass = "xxxxxxxx";
        $dsn = "mysql:host=$host;dbname=$user";
        try
        {
                $connection = new PDO($dsn, $user, $pass);
        }
        catch(PDOException $exception)
        {
                echo("<p>Error: ");
                echo($exception->getMessage());
                echo("</p>");
                exit();
        }

        $sql = "SELECT * FROM account";
        $result = $connection->query($sql);
        if ($result == FALSE)
        {
                $info = $connection->errorInfo();
                echo("<p>Error: {$info[2]}</p>");
                exit();
        }

        echo("<table border=\"1\">");
        echo("<tr><td>account_number</td><td>branch_name</td><td>balance</td></tr>");
        foreach($result as $row)
        {
                echo("<tr><td>");
                echo($row['account_number']);
                echo("</td><td>");
                echo($row['branch_name']);
                echo("</td><td>");
                echo($row['balance']);
                echo("</td></tr>");
        }
        echo("</table>");

    $connection = null;
?>
    </body>
</html>
```

49. Save this code in a file called **accounts.php** on your local machine.

50. Replace the values of **$user** and **$password** with your login information for MySQL (your username from Fénix, and the password from **mysql_reset**)

51. Use an SFTP client (such as **WinSCP** or **FileZilla**) to open you home directory on sigma.ist.utl.pt. Use the following login info:
    - Host: sigma.tecnico.ulisboa.pt | Port: 22
    - Username: (your username from Fénix)
    - Password: (your password from Fénix)

52. Locate the folder "web" inside your home directory. This is where you should put your PHP scripts.

53. Move or copy the file **accounts.php** into your "web" folder.

54. Open the Web browser on your local machine and navigate to:
    http://web.tecnico.ulisboa.pt/istxxxxxx/accounts.php
    where **istxxxxxx** is to be replaced by your username.

55. You should see the following table appearing in your browser.

account_number	branch_name	balance
A-101	Downtown	500.00
A-102	Perryridge	400.00
A-201	Brighton	900.00
A-215	Mianus	700.00
A-217	Brighton	750.00
A-222	Redwood	700.00
A-305	Round Hill	350.00

56. Right-click somewhere on the Web page and select "View Page Source" to view the HTML code that was sent to the Web browser. This HTML code has been dynamically produced by the PHP script.

Part IV: Inserting a new account

We will now create a form to insert a new account into the database. For that purpose, we will use the following PHP script:

```
<html>
  <body>
    <form action="insert.php" method="post">
      <h3>Insert a new account</h3>
      <p>Account no.: <input type="text" name="account_number"/></p>
      <p>Branch:
        <select name="branch_name">
<?php
      $host = "db.ist.utl.pt";
      $user = "istxxxxxx";
      $pass = "xxxxxxxx";
      $dsn = "mysql:host=$host;dbname=$user";
      try
      {
            $connection = new PDO($dsn, $user, $pass);
      }
      catch(PDOException $exception)
      {
            echo("<p>Error: ");
            echo($exception->getMessage());
            echo("</p>");
            exit();
      }

      $sql = "SELECT branch_name FROM branch ORDER BY branch_name";
      $result = $connection->query($sql);
      if ($result == FALSE)
      {
            $info = $connection->errorInfo();
            echo("<p>Error: {$info[2]}</p>");
            exit();
      }

      foreach($result as $row)
      {
            $branch_name = $row['branch_name'];
            echo("<option value=\"$branch_name\">$branch_name</option>");
      }

    $connection = null;
?>
        </select>
      </p>
      <p>Balance: <input type="text" name="balance"/></p>
      <p><input type="submit" value="Submit"/></p>
    </form>
  </body>
</html>
```
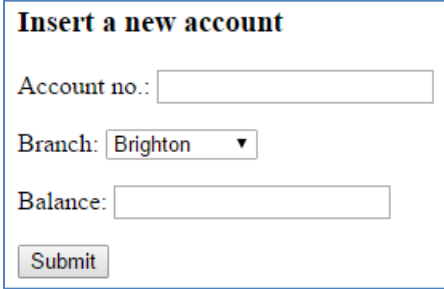
57. Save the code above in a file called **newaccount.php** on your local machine.

58. Replace the values of **$user** and **$password** with your login information for MySQL (your username from Fénix, and the password from **mysql_reset**)

59. Using an SFTP client as you did before, move or copy the file **newaccount.php** to your "web" folder on sigma.ist.utl.pt.

60. Open the Web browser on your local machine and navigate to:
    http://web.tecnico.ulisboa.pt/istxxxxxx/newaccount.php
    where **istxxxxxx** is to be replaced by your username.

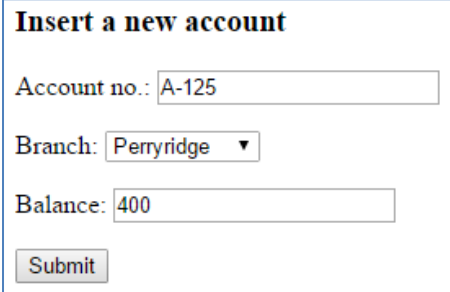61. You should see the following form appearing in your browser:

62. Click the drop-down list next to "Branch:" and note that it has been populated with the branch names that exist in the database. This has been done in the PHP script.

63. Right-click somewhere on the Web page and select "View Page Source" to view the HTML code that was sent to the Web browser.

64. Try filling out the form (for example with account no. **A-125**, branch **Perryridge**, and balance **400**).

65. Press the submit button. You will see that the browser jumps to the page **insert.php** but this page is not available yet. We will create it in the next step.

Page Not Found

The page may not exist or have a different address, please verify if the url of the page is written correctly. If you have followed an old or incorrect internal link you should report the situation to the e-mail dsi@tecnico.ulisboa.pt.

66. We will now create a PHP script to receive the data from the form and insert a new account in the database. For this purpose, we will use the following script:

```
<html>
  <body>
<?php
      $host = "db.tecnico.ulisboa.pt";
      $user = "istxxxxxx";
      $pass = "xxxxxxxx";
      $dsn = "mysql:host=$host;dbname=$user";
      try
      {
            $connection = new PDO($dsn, $user, $pass);
      }
      catch(PDOException $exception)
      {
            echo("<p>Error: ");
            echo($exception->getMessage());
            echo("</p>");
            exit();
      }

      $account_number = $_REQUEST['account_number'];
      $branch_name = $_REQUEST['branch_name'];
      $balance = $_REQUEST['balance'];

      $sql = "INSERT INTO account VALUES ('$account_number', '$branch_name', $balance)";

      echo("<p>$sql</p>");

      $nrows = $connection->exec($sql);

      echo("<p>Rows inserted: $nrows</p>");

    $connection = null;
?>
  </body>
</html>
```

67. Save the code above in a file called **insert.php** on your local machine.

68. Replace the values of **$user** and **$password** with your login information for MySQL (your username from Fénix, and the password from **mysql_reset**)

69. Using an SFTP client as you did before, move or copy the file **insert.php** to your "web" folder on sigma.tecnico.ulisboa.pt.

70. Now go back to the form you had earlier in your browser:
http://web.tecnico.ulisboa.pt/istxxxxxx/newaccount.php
where **istxxxxxx** is to be replaced by your username.

71. Fill out the form (for example, account no. **A-125**, branch **Perryridge**, and balance **400**) and press the submit button. This time you will see the following in your browser:

> INSERT INTO account VALUES ('A-125', 'Brighton', 400)
>
> Rows inserted: 1

(The actual data depends on the values that you have inserted in the form.)

72. Right-click somewhere on the Web page and select "View Page Source" to view the HTML code that was sent to the Web browser.

73. A new account has been inserted in the database. Navigate to:
http://web.tecnico.ulisboa.pt/istxxxxxx/accounts.php
where **istxxxxxx** is to be replaced by your username.

74. You should see the new account A-125 in the results.

Part V: Checking the balance of an account

We will now create a Web page to provide the possibility of checking the balance of a specific account. For this purpose, we will use the following HTML form:

```
<html>
  <body>
    <form action="select.php" method="post">
      <h3>Check balance</h3>
      <p>Account no.: <input type="text" name="account_number"/></p>
      <p><input type="submit"/></p>
    </form>
  </body>
</html>
```
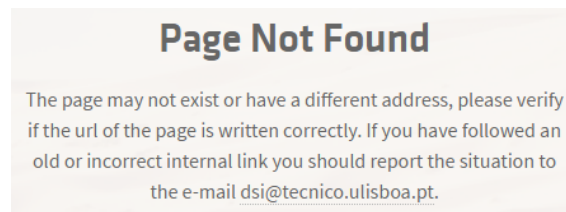
75. Save the code above in a file called **checkbalance.php** on your local machine.

76. Using an SFTP client as you did before, move or copy the file **checkbalance.php** to your "web" folder on sigma.ist.utl.pt.

77. Open the Web browser on your local machine and navigate to:
http://web.tecnico.ulisboa.pt/istxxxxxx/checkbalance.php
where **istxxxxxx** is to be replaced by your username.

78. You should see the following form appearing in your browser:

Check balance

Account no.: [   ]

[Submit]

79. Fill out the form (for example with account no. **A-125**) and press the submit button. You will see that the browser jumps to the page **select.php** but this page is not available yet. We will create it in the next step.

Page Not Found

The page may not exist or have a different address, please verify if the url of the page is written correctly. If you have followed an old or incorrect internal link you should report the situation to the e-mail dsi@tecnico.ulisboa.pt.

80. We will now create a PHP script to receive the account number from the form and select the balance of that account from the database:

```php
<html>
  <body>
<?php
      $host = "db.tecnico.ulisboa.pt";
      $user = "istxxxxxx";
      $pass = "xxxxxxxx";
      $dsn = "mysql:host=$host;dbname=$user";
      try
      {
            $connection = new PDO($dsn, $user, $pass);
      }
      catch(PDOException $exception)
      {
            echo("<p>Error: ");
            echo($exception->getMessage());
            echo("</p>");
            exit();
      }

      $account_number = $_REQUEST['account_number'];

      $sql = "SELECT balance FROM account WHERE account_number='$account_number'";
      echo("<p>$sql</p>");
      $result = $connection->query($sql);

      $nrows = $result->rowCount();
      if ($nrows == 0)
      {
            echo("<p>There is no account with such number.</p>");
      }
      else
      {
            $row = $result->fetch();
            $balance = $row['balance'];
            echo("<p>The balance of $account_number is: $balance</p>");
      }

    $connection = null;
?>
  </body>
</html>
```

81. Save the code above in a file called **select.php** on your local machine.

82. Replace the values of **$user** and **$password** with your login information for MySQL (your username from Fénix, and the password from **mysql_reset**)

83. Using an SFTP client as you did before, move or copy the file **select.php** to your "web" folder on sigma.tecnico.ulisboa.pt.

84. Now go back to the form you had earlier in your browser:
    http://web.tecnico.ulisboa.pt/istxxxxxx/checkbalance.php
    where **istxxxxxx** is to be replaced by your username.

85. Fill out the form (for example with account no. **A-125**) and press the submit button. This time you will see the following in your browser:

SELECT balance FROM account WHERE account_number='A-125'

The balance of A-125 is: 400.00

86. Press the "Back" button on your browser, and fill in the form with an account number that does not exist (e.g. **A-900**). You should see the following in your browser:

SELECT balance FROM account WHERE account_number='A-900'

There is no account with such number.

87. Have a look at the code in **select.php** and find out how the script is checking if the account actually exists.

88. Have another look at the code in **select.php** and find out how the script is retrieving the balance from the database.
    Note: Since we are retrieving a single result, it is enough to fetch the first row.

Part VI: Changing the balance of an account

We will now create a Web page to provide the possibility of changing the balance of any given account. For this purpose, we will use the following PHP script:

```
<html>
    <body>
    <h3>Balances</h3>
<?php
        $host = "db.tecnico.ulisboa.pt";
        $user = "istxxxxxx";
        $pass = "xxxxxxxx";
        $dsn = "mysql:host=$host;dbname=$user";
        try
        {
                $connection = new PDO($dsn, $user, $pass);
        }
        catch(PDOException $exception)
        {
                echo("<p>Error: ");
                echo($exception->getMessage());
                echo("</p>");
                exit();
        }

        $sql = "SELECT * FROM account";
        $result = $connection->query($sql);
        if ($result == FALSE)
        {
                $info = $connection->errorInfo();
                echo("<p>Error: {$info[2]}</p>");
                exit();
        }

        echo("<table border=\"0\" cellspacing=\"5\">\n");
        foreach($result as $row)
        {
                echo("<tr>\n");
                echo("<td>{$row['account_number']}</td>\n");
                echo("<td>{$row['balance']}</td>\n");
                echo("<td><a href=\"newbalance.php?account_number=");
                echo($row['account_number']);
                echo("\">Change balance</a></td>\n");
                echo("</tr>\n");
        }
        echo("</table>\n");

    $connection = null;
?>
    </body>
</html>
```

89. Save the code above in a file called **balances.php** on your local machine.

90. Replace the values of the **$user** and **$password** variables with your login information for MySQL (your username from Fénix, and the password from **mysql_reset**)

91. Using an SFTP client as you did before, move or copy the file **balances.php** to your "web" folder on sigma.ist.utl.pt.

92. Open the Web browser on your local machine and navigate to:
http://web.tecnico.ulisboa.pt/istxxxxxx/balances.php
where **istxxxxxx** is to be replaced by your username.

93. You should see the following table appearing in your browser:

Accounts

A-101	500.00	Change balance
A-102	400.00	Change balance
A-125	400.00	Change balance
A-201	900.00	Change balance
A-215	700.00	Change balance
A-217	750.00	Change balance
A-222	700.00	Change balance
A-305	350.00	Change balance

94. Right-click somewhere on the Web page and select "View Page Source" to view the HTML code that was sent to the Web browser.

95. Click on the link "Change balance" to the right of A-125. You will see that the browser jumps to the page:
http://web.tecnico.ulisboa.pt/istxxxxxx/newbalance.php?account_number=A-125
but this page is not available yet. We will create it in the next step.

96. Using the following PHP script, we create a form to submit the new balance for the specified account:

```
<html>
    <body>
        <h3>Change balance for account <?=$_REQUEST['account_number']?></h3>
        <form action="update.php" method="post">
            <p><input type="hidden" name="account_number"
value="<?=$_REQUEST['account_number']?>"/></p>
            <p>New balance: <input type="text" name="balance"/></p>
            <p><input type="submit" value="Submit"/></p>
        </form>
    </body>
</html>
```

97. Note that the code `<?=$_REQUEST['account_number']?>` is being used to fill in the account number dynamically. This account number comes in the URL itself: **http://web.tecnico.ulisboa.pt/istxxxxxx/newbalance.php?account_number=A-125**

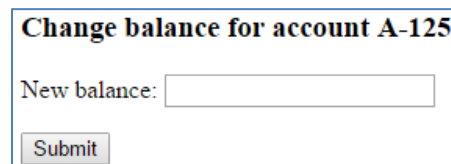98. Save the code above in a file called **newbalance.php** on your local machine.

99. Using an SFTP client as you did before, move or copy the file **newbalance.php** to your "web" folder on sigma.ist.utl.pt.

100. Now go back to the page you had earlier in your browser:
http://web.tecnico.ulisboa.pt/istxxxxxx/balances.php
where **istxxxxxx** is to be replaced by your username.

101. Click on the link "Change balance" to the right of A-125. Now you should see the following form appearing in your browser:

Change balance for account A-125

New balance: [   ]

Submit

102. Right-click somewhere on the Web page and select "View Page Source" to view the HTML code that was sent to the Web browser.
Note: the account number is being included as a hidden input in the form.

103. Fill in a new balance for account A-125. For example, use the value **550** and press submit. You will see that the browser jumps to the page **update.php** but this page is not available yet. We will create it in the next step.

104. We will now create a PHP script that connects to the database and updates the balance of a given account. For this purpose, we will use the following code:

```
<html>
    <body>
<?php
      $host = "db.ist.utl.pt";
      $user = "istxxxxxx";
      $pass = "xxxxxxxx";
      $dsn = "mysql:host=$host;dbname=$user";
      try
      {
             $connection = new PDO($dsn, $user, $pass);
      }
      catch(PDOException $exception)
      {
             echo("<p>Error: ");
             echo($exception->getMessage());
             echo("</p>");
             exit();
      }

      $account_number = $_REQUEST['account_number'];
      $balance = $_REQUEST['balance'];

      $sql = "UPDATE account SET balance = $balance WHERE account_number =
'$account_number'";

      echo("<p>$sql</p>");

      $nrows = $connection->exec($sql);

      echo("<p>Rows updated: $nrows</p>");

    $connection = null;
?>
    </body>
</html>
```

105. Save the code above in a file called **update.php** on your local machine.

106. Replace the values of the **$user** and **$password** variables with your login information for MySQL (your username from Fénix, and the password from **mysql_reset**)

107. Using an SFTP client as you did before, move or copy the file **update.php** to your "web" folder on sigma.tecnico.ulisboa.pt.

108. Now go back to the page you had earlier in your browser:
http://web.tecnico.ulisboa.pt/istxxxxxx/balances.php
where **istxxxxxx** is to be replaced by your username.

109. Click on the link "Change balance" to the right of A-125. You should see the "Change balance" form appearing in your browser.

110. Specify a new balance (use, for example, **550**) and press the submit button. You should see the following appearing in your browser:

UPDATE account SET balance = 550 WHERE account_number = 'A-125'

Rows updated: 1

(The actual balance depends on the value that you have inserted in the form.)

111. Right-click somewhere on the Web page and select "View Page Source" to view the HTML code that was sent to the Web browser.

112. The balance of account A-125 has been changed. Navigate to:
http://web.tecnico.ulisboa.pt/istxxxxxx/accounts.php
where **istxxxxxx** is to be replaced by your username.

113. You should see the new balance for the account A-125.

account_number	branch_name	balance
A-101	Downtown	500.00
A-102	Perryridge	400.00
A-125	Brighton	550.00
A-201	Brighton	900.00
A-215	Mianus	700.00
A-217	Brighton	750.00
A-222	Redwood	700.00
A-305	Round Hill	350.00

Exercise

114.   Create a Web page to delete an existing account. For this purpose, you will need:
   - A form that lets the user choose the account to be deleted. This form should retrieve the list of existing accounts from the database.
   - A script that deletes the account by executing the following query:

        `$sql = "DELETE FROM account WHERE account_number = '$account_number'"`

        where **$account_number** is the PHP variable that holds the account number of the account to be deleted.

115.   Use the form to delete the account A-125 that has been inserted in this lab.