Lab Session 9: PHP and MySQL

In the previous lab, 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 lab 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).

Part I: Listing the accounts

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.

```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();
        }

        $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>
```

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

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

3. 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)

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

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

6. 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.

7. 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

8. 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: 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>
```

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

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

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

11. 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.

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

13. 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.

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.

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

16. 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.

17. 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:

```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'];
       $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>
```

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

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

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

21. 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.

22. 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.)

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

24. 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.

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

Part III: 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>
```

26. Save the code above in a file called **checkbalance.php** on your local machine.

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

28. 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.

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

Check balance

Account no.: [   ]

[Submit]

30. 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.

31. 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:

```
<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>
```

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

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

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

35. 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.

36. 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

37. 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.

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

39. 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 IV: 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>
```

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

41. 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**)

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

43. 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.

44. 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

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

46. 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.

47. 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>
```

48. 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**

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

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

51. 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.

52. 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]

53. 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.

54. 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.

55. 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>
```

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

57. 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**)

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

59. 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.

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

61. 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.)

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

63. 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.

64. 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

65. 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.

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