PHP Web-Application Example

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PHP Installation Recommendations

If you're not familiar with PHP development environment and want to try it out, we recommend:

1. Download & Install Oracle Virtual Box – software for installing virtual (guest) operating systems and running them from existing (host) operating system - https://www.virtualbox.org/wiki/Downloads

- User Manual - https://www.virtualbox.org/manual/UserManual.html

2. Download & Install Ubuntu 20.04 LTS as your guest operating system
   - https://ubuntu.com/download/desktop
3. Follow Microsoft's instruction on installing PHP, Apache Web-server & ODBC driver for Azure SQL Database
   - https://docs.microsoft.com/en-us/sql/connect/php/installation-tutorial-linux-mac?view=azuresqldb-current

Useful Links

- PHP Language Reference - https://www.php.net/manual/en/langref.php
- PHP Tutorial - https://www.w3schools.com/php/default.asp
- PHP & Azure SQL - https://docs.microsoft.com/en-us/azure/sql-database/sql-database-connect-query-php

Source Files (also available on Canvas)

Below source files compose a simple PHP web-application which uses Azure SQL database to store and update the data about upcoming movie nights at someone's house.

- SQL file is expected to be executed once in your SQL IDE of choice (Azure Data Studio, for example).
- PHP files are expected to be placed at the root directory of your web-server ("/var/www/html" for Apache HTTP Web-server installed in Ubuntu 20.04 LTS).

- Once the PHP files are copied over to the intended destination, and assuming your web-server is running on localhost you can test them by visiting http://localhost/get_all_movies.php and http://localhost/add_movie_form.php in your browser.

create_table.sql

Executing the queries in the below .sql file (with Azure Data Studio, for example) creates a very simple database for storing information about upcoming movie nights at someone's house.

```
DROP TABLE IF EXISTS movie_night; --Drop the table if it was previously created

--Create the new table for movie_nights schedule



CREATE TABLE movie_night (

    start_time DATETIME PRIMARY KEY,

    movie_name VARCHAR(64),

    duration_min INT,

    guest_1 VARCHAR(64),

    guest_2 VARCHAR(64),

    guest_3 VARCHAR(64),

    guest_4 VARCHAR(64),
```

```
    guest_5 VARCHAR(64),
);

--Insert two records to begin with
INSERT INTO movie_night
 (start_time, movie_name, duration_min, guest_1, guest_2)
VALUES
 ('2019-12-31 20:00:00', 'Home Alone', 150, 'Taras', 'Jared'),
 ('2020-01-03 19:00:00', 'Diehard', 180, 'Taras', 'Aaron');
```

data_handler.php

- Below PHP file contains code used to connect to the Azure SQL Database and execute the example queries. This file should be located at the root folder of your web-server ("/var/www/html" for Apache HTTP Web-server installed in Ubuntu 20.04 LTS).
- *Make sure to substitute your own values into $serverName, "database", "uid" and "pwd".*

```
<?php
   // Displays SQL errors
   function formatErrors($errors) {
      echo "Error information: <br/>";
      foreach ($errors as $error) {
         echo "SQLSTATE: ". $error['SQLSTATE'] . "<br/>";
         echo "Code: ". $error['code'] . "<br/>";
         echo "Message: ". $error['message'] . "<br/>";
```

```
    }
}

// Returns the connection to the Azure SQL database
function getConnection() {
    $serverName = "<Replace Me>.database.windows.net";
    $connectionOptions = array(
        "database" => "<Replace Me>",
        "uid" => "<Replace Me>",
        "pwd" => "<Replace Me>"
    );

    // Establishes the connection
    $conn = sqlsrv_connect($serverName, $connectionOptions);
    if ($conn === false) {
        die(formatErrors(sqlsrv_errors()));
    }

    return $conn;
}

// Returns an array of all movie_night records
function getAllMovies() {
    $conn = getConnection();

    // Select Query
    $tsql = "SELECT * FROM movie_night";

    // Prepare & execute the query
    $stmt = sqlsrv_query($conn, $tsql);

    // Error handling
    if ($stmt === false) {
        die(formatErrors(sqlsrv_errors()));
    }

    // Iterate over returned records and pack them into an array
    $result = array();
```

```
    while ($row = sqlsrv_fetch_array($stmt, SQLSRV_FETCH_ASSOC)) {
        array_push($result, $row);
    }

    // Close the DB connection
    sqlsrv_free_stmt($stmt);
    sqlsrv_close($conn);

    return $result;
}

// Inserts the new movie_night record with the given attribute values
function addMovie($startTime, $movieName, $duration, $g1, $g2, $g3, $g4, $g5) {
    $conn = getConnection();

    // Insert SQL query template
    $tsql = "INSERT INTO movie_night ".
            "(start_time, movie_name, duration_min, guest_1, guest_2, guest_3, guest_4, guest_5) ".
          "VALUES ".
            "(?, ?, ?, ?, ?, ?, ?, ?)";

    // Prepares the SQL query
    $stmt = sqlsrv_prepare($conn, $tsql, array($startTime, $movieName, $duration, $g1, $g2, $g3, $g4, $g5));

    // Error handling
    if ($stmt === false) {
        die(formatErrors(sqlsrv_errors()));
    }

    // Executes the query
    $result = sqlsrv_execute($stmt);

    // Close the database connection
    sqlsrv_free_stmt($stmt);
    sqlsrv_close($conn);

    return $result;
}
```

```
?>
```

get_all_movies.php

Executing below PHP file generates an HTML file with a table containing all the records from the movie_night SQL database table. This file should be located at the root folder of your web-server ("/var/www/html" for Apache HTTP Web-server installed in Ubuntu 20.04 LTS)

```
<!DOCTYPE html>
<html>
  <head>
  <meta charset="UTF-8">
    <title>Movie Nights</title>
  </head>
  <body>
    <!-- The table for displaying all the movie records -->
    <table cellspacing="2" cellpadding="2" border="1">
      <tr> <!-- The table headers row -->
        <td align="center">
          <h4>Time</h4>
        </td>
        <td align="center">
          <h4>Movie Name</h4>
        </td>
        <td align="center">
          <h4>Duration</h4>
        </td>
        <td align="center">
          <h4>Guest 1</h4>
        </td>
        <td align="center">
          <h4>Guest 2</h4>
        </td>
        <td align="center">
          <h4>Guest 3</h4>
        </td>
        <td align="center">
```

```
      <h4>Guest 4</h4>
     </td>
     <td align="center">
      <h4>Guest 5</h4>
     </td>
    </tr>

    <?php
      require 'data_handler.php';

      // Get an array of movie night from the database
      $movies = getAllMovies();

      // For each array entry, print out a table row with its attribute values
      foreach ($movies as $row) {
        echo ("<tr>".
          "<td>".$row['start_time']->format('Y-m-d H:i:s')."</td>".
          "<td>".$row['movie_name']."</td>".
          "<td>".$row['duration_min']."</td>".
          "<td>".$row['guest_1']."</td>".
          "<td>".$row['guest_2']."</td>".
          "<td>".$row['guest_3']."</td>".
          "<td>".$row['guest_4']."</td>".
          "<td>".$row['guest_5']."</td>".
        "</tr>".PHP_EOL);
      }
    ?>

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

add_movie_form.php

Below PHP file (strictly speaking it's just a static HTML file) generates an HTML for collection of user input to insert a new record into a movie_night table. Upon form submission, add_movie.php (see below) file will be invoked to process the user input. This file should be

located at the root folder of your web-server ("/var/www/html" for Apache HTTP Web-server installed in Ubuntu 20.04 LTS)

```
<!DOCTYPE html>
<html>
   <head>
      <meta charset="UTF-8">
      <title>Add Movie Night</title>
   </head>
   <body>
      <h2>Add Movie Night</h2>
      <!--
         Form for collecting user input for the new movie_night record.
         Upon form submission, add_movie.php file will be invoked.
      -->
      <form action="add_movie.php">
         <!-- The form organized in an HTML table for better clarity. -->
         <table border=1>
            <tr>
               <th colspan="2">Enter the Movie Night Data:</th>
            </tr>
            <tr>
               <td>Movie night time:</td>
               <td><div style="text-align: center;">
               <input type=text name=start_time>
               </div></td>
            </tr>
            <tr>
               <td>Movie Name:</td>
               <td><div style="text-align: center;">
               <input type=text name=movie_name>
               </div></td>
            </tr>
            <tr>
               <td>Duration:</td>
               <td><div style="text-align: center;">
               <input type=text name=duration_min>
```

```
    </div></td>
</tr>
<tr>
    <td>Guest 1 Name:</td>
    <td><div style="text-align: center;">
    <input type=text name=guest_1>
    </div></td>
</tr>
<tr>
    <td>Guest 2 Name</td>
    <td><div style="text-align: center;">
    <input type=text name=guest_2>
    </div></td>
</tr>
<tr>
    <td>Guest 3 Name</td>
    <td><div style="text-align: center;">
    <input type=text name=guest_3>
    </div></td>
</tr>
<tr>
    <td>Guest 4 Name</td>
    <td><div style="text-align: center;">
    <input type=text name=guest_4>
    </div></td>
</tr>
<tr>
    <td>Guest 5 Name</td>
    <td><div style="text-align: center;">
    <input type=text name=guest_5>
    </div></td>
</tr>
<tr>
    <td><div style="text-align: center;">
    <input type=reset value=Clear>
    </div></td>
    <td><div style="text-align: center;">
    <input type=submit value=Insert>
```

```
            </div></td>
          </tr>
        </table>
      </form>
    </body>
</html>
```

add_movie.php

Below PHP file processes the user request to insert a new record into movie_night table initiated by the add_movie_form.php file and generates the HTML file response confirming the insertion or notifying of the problem. This file should be located at the root folder of your web-server ("/var/www/html" for Apache HTTP Web-server installed in Ubuntu 20.04 LTS)

```
<!DOCTYPE html>
<html>
  <head>
    <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
    <title>Query Result</title>
  </head>
  <body>
  <?php
    require 'data_handler.php';

    // Get the attribute values passed from the input form.
    $startTime = $_REQUEST['start_time'];
    $movieName = $_REQUEST['movie_name'];
    $durationString = $_REQUEST['duration_min'];
    $g1 = $_REQUEST['guest_1'];
    $g2 = $_REQUEST['guest_2'];
    $g3 = $_REQUEST['guest_3'];
    $g4 = $_REQUEST['guest_4'];
    $g5 = $_REQUEST['guest_5'];

    // Check whether the required attributes were provided
    if (!$startTime || !$movieName || !$durationString) {
```

```
            // If not, redirect back to the form page
            header("Location: add_movie_form.php");
            exit();
        }

        // Insert the new record into the database
        if (addMovie($startTime, $movieName, $durationString, $g1, $g2, $g3, $g4, $g5)) {
            // If the insertion was successful, print out a confirmation message
            ?>
            <h2>The Movie Night:</h2>
            <ul>
                <li>Start Time: <?= $startTime ?></li>
                <li>Movie Name: <?= $movieName ?></li>
                <li>Duration: <?= $durationString ?></li>
                <li>Guest 1: <?= $g1 ?></li>
                <li>Guest 2: <?= $g2 ?></li>
                <li>Guest 3: <?= $g3 ?></li>
                <li>Guest 4: <?= $g4 ?></li>
                <li>Guest 5: <?= $g5 ?></li>
            </ul>
            <h2>Was successfully inserted.</h2>
            <a href="get_all_movies.php">See all movie nights.</a>
            <?php
        } else {
            // If the insertion was unsuccessful, print out SQL errors
            ?>
                <h2>There was a problem inserting the course</h2><br/>
            <?php
                sqlsrv_errors();
        }
    ?>
    </body>
</html>
```