

Expert Q&A

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Question

Web Security
Prepare a web application with the following features:
A login page that is vulnerable to SQL Injection (SQLi)
A secure login page to solve the issues faced in #1 and prevent SQLi
Authentication (OTP & Email)
Authorization
Accounting (Prepare user log, Block user based on activity)
Submission Instructions

Submit the project as a .zip file
Submit a video explaining the project (upload the video on youtube/drive and paste the URL only)

Expert Answer



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This solution was written by a subject matter expert. It's designed to help students like you learn core concepts.

```
1. Login page that is vulnerable to SQL Injection (SQLi)
<html>
<head>
<title>Login Page</title>
</head>
<body>
<form action="login.php" method="post">
<label>Username:</label>
<input type="text" name="username" /><br><br>
<label>Password:</label>
<input type="password" name="password" /><br><br>
<input type="submit" value="Login" />
</form>
</body>
</html>
<?php
if(isset($_POST['username']) && isset($_POST['password'])){
$username = $_POST['username'];
$password = $_POST['password'];
$query = "SELECT * FROM users WHERE username='$username' AND password='$password'";
$result = mysqli_query($connection, $query);
if(mysqli_num_rows($result) == 1){
echo "Welcome, $username";
} else{
echo "Invalid login";
}
}
?>

2. Secure login page to solve the issues faced in #1 and prevent SQLi
<html>
<head>
<title>Login Page</title>
</head>
<body>
<form action="login.php" method="post">
<label>Username:</label>
<input type="text" name="username" /><br><br>
<label>Password:</label>
<input type="password" name="password" /><br><br>
<input type="submit" value="Login" />
</form>
</body>
</html>
<?php
if(isset($_POST['username']) && isset($_POST['password'])){
$username = mysqli_real_escape_string($connection, $_POST['username']);
$password = mysqli_real_escape_string($connection, $_POST['password']);
$query = "SELECT * FROM users WHERE username='$username' AND password='$password'";
$result = mysqli_query($connection, $query);
if(mysqli_num_rows($result) == 1){
echo "Welcome, $username";
} else{
echo "Invalid login";
}
}
?>

3. Authentication (OTP & Email)
<?php
//include the OTP generator library
require 'vendor/autoload.php';
use RandomLib\Factory as RandomLib;
//include the PHPMailer library
use PHPMailer\PHPMailer\PHPMailer;
use PHPMailer\PHPMailer\Exception;
//include the config file
require 'config.php';
//check if the form is submitted
if(isset($_POST['submit'])){
//get the form data
$email = $_POST['email'];
$password = $_POST['password'];
//validate the data
if(empty($email) && empty($password)){
//check if the email is valid
if(filter_var($email, FILTER_VALIDATE_EMAIL) === false){
$error .= "Please enter a valid email";
}

//if there is no error, continue
if($error == ""){
//generate OTP
$factory = new RandomLib();
$generator = $factory->getMediumStrengthGenerator();
$otp = $generator->generateString(6, '0123456789');
//send email
$email = new PHPMailer();
$email->isSMTP();
$email->Host = 'smtp.gmail.com';
$email->SMTPAuth = true;
$email->Username = EMAIL;
$email->Password = PASSWORD;
$email->SMTPSecure = 'ssl';
$email->Port = 465;
$email->setFrom(EMAIL, "Your Name");
$email->addAddress($email);
$email->addReplyTo(EMAIL);
$email->isHTML(true);
$email->Subject = "OTP for login";
$email->Body = "Your OTP for login is: " . $otp;
if($email->send()){
$error .= "Email not sent";
} else{
//if the email is sent, store the OTP in the session
$_SESSION['otp'] = $otp;
//redirect to the OTP page
header("location: otp.php");
exit;
}
}
} else{
$error .= "All fields are required";
}
}
?>
<html>
<head>
<title>Login</title>
</head>
<body>
<form action="" method="post">
<p><label>Email:</label><input type="text" name="email" /></p>
<p><label>Password:</label><input type="password" name="password" /></p>
<p><input type="submit" name="submit" value="Login" /></p>
</form>
</body>
</html>
```



```
4. Authorization
<?php
//start the session
session_start();
//If the user is not logged in, redirect to the login page
if(!isset($_SESSION['logged_in'])){
    header('Location: index.php');
    exit;
}
?>

<html>
<head>
<title>Protected Page</title>
</head>
<body>
<ht>This is a protected page</ht>
<p>You are logged in as <?php echo $_SESSION['username']; ?></p>
</body>
</html>
```

```
5. Accounting (Prepare user log, Block user based on activity)
<?php
//include the config file
require 'config.php';
//get the IP address of the user
$ip = $_SERVER['REMOTE_ADDR'];
//get the time the user accessed the page
$time = time();
//get the URL the user accessed
$url = $_SERVER['REQUEST_URI'];
//get the user agent of the user
$user_agent = $_SERVER['HTTP_USER_AGENT'];
//insert the data into the database
$query = "INSERT INTO user_log (ip_address, time, url, user_agent) VALUES ('$ip', '$time', '$url', '$user_agent')";
mysql_query($connection, $query);
?>
```

```
Full code

<?php
//include the config file
require 'config.php';
//start the session
session_start();
//If the user is not logged in, redirect to the login page
if(!isset($_SESSION['logged_in'])){
    header('Location: index.php');
    exit;
}

//get the IP address of the user
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<html>
<head>
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Was this answer helpful?

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- Q:

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