

This PHP implementation provides a secure login system with reCAPTCHA and password hashing, suitable for use with XAMPP on localhost.

Here's a breakdown of the components:

config.php: Contains database connection details and reCAPTCHA keys.

functions.php: Includes the verifyRecaptcha function.

register.php: Handles user registration with reCAPTCHA verification and password hashing.

login.php: Manages user login with reCAPTCHA verification and password checking.

welcome.php: A simple welcome page for logged-in users.

logout.php: Handles user logout.

To set up this system:

Create a new database named 'login_system' in your MySQL server.

Create a 'users' table with the following SQL command:

```
CREATE TABLE users (  
    id INT NOT NULL PRIMARY KEY AUTO_INCREMENT,  
    username VARCHAR(50) NOT NULL UNIQUE,  
    password VARCHAR(255) NOT NULL,  
    created_at DATETIME DEFAULT CURRENT_TIMESTAMP  
);
```

Replace 'your_recaptcha_site_key' and 'your_recaptcha_secret_key' with your actual reCAPTCHA keys from Google.

Place these PHP files in your XAMPP htdocs directory.

Access the registration page through your browser (e.g., <http://localhost/register.php>).

This implementation includes:

- Password hashing using PHP's built-in password_hash() function.
- reCAPTCHA v2 integration for both registration and login.
- Basic SQL injection prevention using prepared statements.
- Session management for logged-in users.

For a production environment, consider implementing additional security measures such as:

- Using HTTPS (you'll need to configure SSL in XAMPP)
- Implementing rate limiting to prevent brute-force attacks
- Adding email verification for new registrations
- Using stronger session management techniques
- Implementing two-factor authentication

```
<?php
// config.php

define('DB_SERVER', 'localhost');
define('DB_USERNAME', 'root');
define('DB_PASSWORD', '');
define('DB_NAME', 'login_system');

$conn = mysqli_connect(DB_SERVER, DB_USERNAME, DB_PASSWORD, DB_NAME);

if($conn === false){
    die("ERROR: Could not connect. " . mysqli_connect_error());
}

$recaptcha_site_key = 'your_recaptcha_site_key';
$recaptcha_secret_key = 'your_recaptcha_secret_key';

// functions.php

function verifyRecaptcha($recaptcha_response) {
    global $recaptcha_secret_key;
    $verify_response =
file_get_contents('https://www.google.com/recaptcha/api/siteverify?secret='.$recaptcha_secret_
key.'&response='.$recaptcha_response);
    $response_data = json_decode($verify_response);
    return $response_data->success;
}

// register.php

session_start();
```

```

if($_SERVER["REQUEST_METHOD"] == "POST"){
    $username = mysqli_real_escape_string($conn, $_POST['username']);
    $password = $_POST['password'];
    $recaptcha_response = $_POST['g-recaptcha-response'];

    if(!verifyRecaptcha($recaptcha_response)){
        $_SESSION['message'] = "Invalid reCAPTCHA. Please try again.";
        header("location: register.php");
        exit();
    }

    $sql = "SELECT id FROM users WHERE username = ?";

    if($stmt = mysqli_prepare($conn, $sql)){
        mysqli_stmt_bind_param($stmt, "s", $param_username);
        $param_username = $username;

        if(mysqli_stmt_execute($stmt)){
            mysqli_stmt_store_result($stmt);

            if(mysqli_stmt_num_rows($stmt) == 1){
                $_SESSION['message'] = "This username is already taken.";
            } else{
                $sql = "INSERT INTO users (username, password) VALUES (?, ?)";

                if($stmt = mysqli_prepare($conn, $sql)){
                    mysqli_stmt_bind_param($stmt, "ss", $param_username, $param_password);
                    $param_username = $username;
                    $param_password = password_hash($password, PASSWORD_DEFAULT);

                    if(mysqli_stmt_execute($stmt)){
                        $_SESSION['message'] = "Registration successful. You can now log in.";
                        header("location: login.php");
                        exit();
                    } else{
                        $_SESSION['message'] = "Something went wrong. Please try again later.";
                    }
                }
            }
        } else{
            $_SESSION['message'] = "Oops! Something went wrong. Please try again later.";
        }
        mysqli_stmt_close($stmt);
    }
}

```

```
}  
?>
```

```
<!DOCTYPE html>  
<html lang="en">  
<head>  
  <meta charset="UTF-8">  
  <title>Sign Up</title>  
  <script src="https://www.google.com/recaptcha/api.js" async defer></script>  
</head>  
<body>  
  <h2>Sign Up</h2>  
  <p><?php echo isset($_SESSION['message']) ? $_SESSION['message'] : ";  
unset($_SESSION['message']); ?></p>  
  <form action="<?php echo htmlspecialchars($_SERVER["PHP_SELF"]); ?>" method="post">  
    <div>  
      <label>Username</label>  
      <input type="text" name="username" required>  
    </div>  
    <div>  
      <label>Password</label>  
      <input type="password" name="password" required>  
    </div>  
    <div class="g-recaptcha" data-sitekey="<?php echo $recaptcha_site_key; ?>"></div>  
    <div>  
      <input type="submit" value="Submit">  
    </div>  
    <p>Already have an account? <a href="login.php">Login here</a>.</p>  
  </form>  
</body>  
</html>
```

```
<?php
```

```
// login.php
```

```
session_start();
```

```
if($_SERVER["REQUEST_METHOD"] == "POST"){  
  $username = mysqli_real_escape_string($conn, $_POST['username']);  
  $password = $_POST['password'];  
  $recaptcha_response = $_POST['g-recaptcha-response'];
```

```

if(!verifyRecaptcha($recaptcha_response)){
    $_SESSION['message'] = "Invalid reCAPTCHA. Please try again.";
    header("location: login.php");
    exit();
}

$sql = "SELECT id, username, password FROM users WHERE username = ?";

if($stmt = mysqli_prepare($conn, $sql)){
    mysqli_stmt_bind_param($stmt, "s", $param_username);
    $param_username = $username;

    if(mysqli_stmt_execute($stmt)){
        mysqli_stmt_store_result($stmt);

        if(mysqli_stmt_num_rows($stmt) == 1){
            mysqli_stmt_bind_result($stmt, $id, $username, $hashed_password);
            if(mysqli_stmt_fetch($stmt)){
                if(password_verify($password, $hashed_password)){
                    session_start();
                    $_SESSION["loggedin"] = true;
                    $_SESSION["id"] = $id;
                    $_SESSION["username"] = $username;
                    header("location: welcome.php");
                } else{
                    $_SESSION['message'] = "Invalid username or password.";
                }
            }
        } else{
            $_SESSION['message'] = "Invalid username or password.";
        }
    } else{
        $_SESSION['message'] = "Oops! Something went wrong. Please try again later.";
    }
    mysqli_stmt_close($stmt);
}
}
?>

```

```

<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Login</title>

```

```

    <script src="https://www.google.com/recaptcha/api.js" async defer></script>
</head>
<body>
    <h2>Login</h2>
    <p><?php echo isset($_SESSION['message']) ? $_SESSION['message'] : "";
unset($_SESSION['message']); ?></p>
    <form action="<?php echo htmlspecialchars($_SERVER["PHP_SELF"]); ?>" method="post">
        <div>
            <label>Username</label>
            <input type="text" name="username" required>
        </div>
        <div>
            <label>Password</label>
            <input type="password" name="password" required>
        </div>
        <div class="g-recaptcha" data-sitekey="<?php echo $recaptcha_site_key; ?>"></div>
        <div>
            <input type="submit" value="Login">
        </div>
        <p>Don't have an account? <a href="register.php">Sign up now</a>.</p>
    </form>
</body>
</html>

```

```

<?php
// welcome.php
session_start();

if(!isset($_SESSION["loggedin"]) || $_SESSION["loggedin"] !== true){
    header("location: login.php");
    exit;
}
?>

<!DOCTYPE html>
<html lang="en">
<head>
    <meta charset="UTF-8">
    <title>Welcome</title>
</head>
<body>
    <h1>Hi, <b><?php echo htmlspecialchars($_SESSION["username"]); ?></b>. Welcome to
our site.</h1>
    <p>

```

```
        <a href="logout.php">Sign Out of Your Account</a>
    </p>
</body>
</html>
```

```
<?php
// logout.php
session_start();
$_SESSION = array();
session_destroy();
header("location: login.php");
exit;
?>
```