COSC 4343: Computer Security and Privacy

Homework # 4: due on Thurs. 11/12/2020 at 11:59 pm

Remaining late days may be used in this assignment if needed.
Check "Late Days" policy in syllabus for more details.

userID	username	password	clearance
1	alice	@l!c3	T
2	bob	B0b	S
3	charlie	Ch@r1!3	C
4	dave	D@v3	U

Table UserAccounts

Part 1: Database Creation

Using your assigned Digital Ocean virtual machine, create a MySQL database with only one table called *UserAccounts*. *UserAccounts* should mimic the table above with the one exception that the password values are stored after being hashed. Choose any hash algorithm of your choice (md5, sha1, etc.).

Part 2: Authentication

Create a webpage that uses the *UserAccounts* table to allow users to log-in after solving a *CAPTCHA* challenge. Your webpage should connect to your MySQL database and use the data in *UserAccounts* to verify the user credentials. Your webpage should contain two text fields (one for username and another for password), a *CAPTCHA*, and a "Sign In" button. The *CAPTCHA* challenge is used to differentiate between human users and machines (e.g. bots). Once the user enters a username, password, and successfully solves the CAPTCHA challenge, your webpage should call a php script to hash the entered password and check both the entered username and hashed password for matches in *UserAccounts*.

Part 3: Authorization

Upon a successful log-in, display a webpage that shows a set of images as described below. The number of images displayed after a successful log-in depends on the clearance level of the logged user. There is a total of 4 images under "Files", named TopSecret.png, Secret.png, Confidential.png, and Unclassified.png. The number of images to display must follow the following criteria:

- Display all 4 images if the logged user has clearance = T (TOP SECRET).
- Display only 3 images (Secret.png, Confidential.png, and Unclassified.png) if the logged user has clearance = S (SECRET).
- Display only 2 images (Confidential.png and Unclassified.png) if the logged user has clearance = C (CONFIDENTIAL).
- Display only 1 image (Unclassified.png) if the logged-in user has clearance = U (UNCLASSIFED).

Finally, add a log out button to this page that takes you back to the log-in page.

Useful links: You may find the following links helpful in solving this assignment

PHP md5 hash: http://php.net/manual/en/function.md5.php
PHP SHA1 hash: http://php.net/manual/en/function.sha1-file.php
PHP CAPTCHA: https://www.phpcaptcha.org/

What to submit:

1. All your website files (php and others) in one zipped file.
2. One Video Recording file (.mov or .mp4) with your audio demonstrating your homework solution. See Video instructions below.

Video Recording Instructions:

The purpose of video recording your solution is to demonstrate your solution to each of the above homework parts. Make sure the length of your video does not exceed 5 minutes, and includes the following:

1. Introduction: your name, course, semester, homework #
2. A quick view of your database data.
3. A demonstration of your website showing a total of 5 log-in attempts: four successful attempts for each user listed in table *UserAccounts,* and a fifth attempt by Trudy (using an incorrect password).
4. Lessons learned in this homework, and a simple thank you for watching.

Final note, please be professional in the recording to a certain extent. All things recorded (picture and audio) in the video must be academically appropriate.

Submission instructions:

1. Your solution should be submitted through Canvas. Email or paper submissions will not be accepted.
2. Make sure your final submission filenames are of the format "HW04-*FirstnameLastname*.zip" and "HW04- *FirstnameLastname*.mp4" or "HW04-*FirstnameLastname*.mov".
3. Double check your submission by redownloading it and make sure it reads well as intended.

Always let me know if you have any questions or need more clarification on the assignment or submission instructions.

Good Luck ☺