

Hacknet, IRL Hacking, and You

By Logan Grannis
ITC-499 Web Systems

Report Summary

- Attempted to build a website that used a version of the Steam game Hacknet to teach users the importance of cybersecurity
 - Website is completely non-functional
- Tried to use JavaScript to make a pared-down version of the game
- Build a database to record all necessary information for each user (username, password, an integer to track progress through the game, etc)

Project Milestones/Timeline

Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	1	2
3	4	5	6	7	8	9

Adjust table row

Red: Research time

Green: Web Development time (HTML/CSS, PHP, JavaScript)

Blue: SQL Database Coding

Orange: Debugging

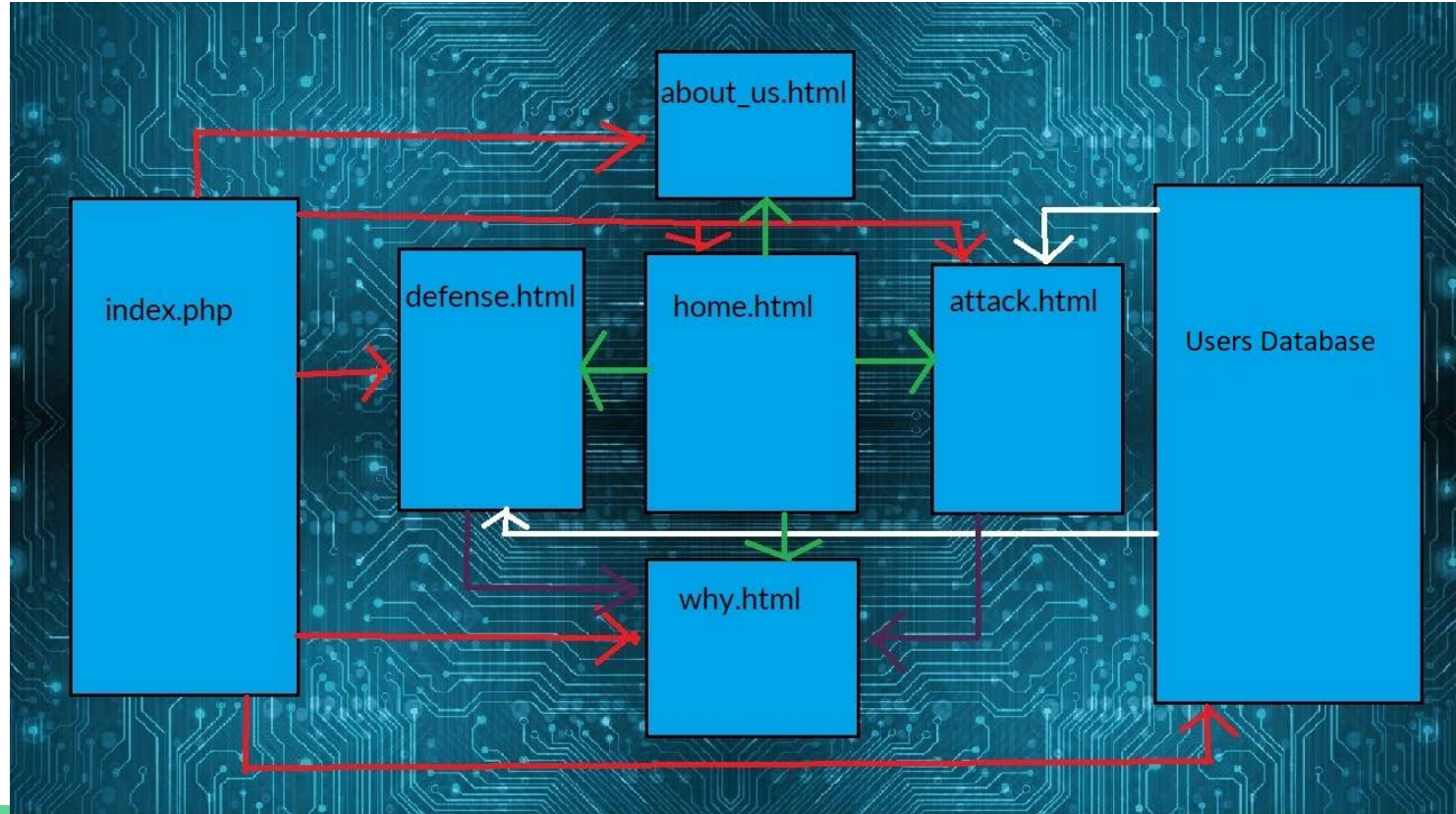
System Requirements

- System must have two functioning games (one for hacking and one for cybersecurity)
- System must have properly formatted webpages
- System must have a SQL database that is referenced properly
- System should allow new users to make new accounts, and for old users to be able to reset their progress and start over if desired
- System should be easy to navigate
- System should be aesthetically appealing

Software Programming Tools

- Notepad++
- XAMPP
- MySQL
- Apache Webserver*

Web System Design



Data Table

✓ MySQL returned an empty result set (i.e. zero rows). (Query took 0.0013 seconds.)

```
SELECT * FROM `users`
```

Id	Username	PASSWORD	Created_At	ProgressInt
----	----------	----------	------------	-------------

“Implementation and Testing”: attack.html

[Home](#)
[About Us](#)
[Attack](#)
[Defense](#)
[Why](#)

Welcome, username. We need you to hack into the CIA and steal some wiretap recordings for us. Any will do.
To do so, navigate to this IP Address: 124.42.38.567. Once there, probe their defenses, get in, download the recordings, wipe the /log directory clean, and get out.
Then, upload the files to our filedump server.
Command out.

--Textbox will appear in the middle of the page. First, the user should type "connect 124.42.38.567". Then, they should type "probe", which will reveal a closed port 80 and closed port 1443.--
--They should then type "HTTPcrack 80" and "SQL_MemCorrupt 1443". These should open the ports. Then, they type "porthack", which will grant the user superuser access.--
--Now they will be presented with a few folders: /home, /log, /sys, /bin, and /wiretap_records. The user should type "mv wiretap_records", and then "scp wiretap_001".--
--Now they type "cd.." to move back to viewing all the folders. Then, "cd log" to move to the log folder, and "rm *" to wipe all traces of their presence. Then, "disconnect" to leave the CIA server.--

Local Terminal | IPv4 Address: 149.105.1.053

Type "connect" followed by the CIA IP address provided to you.

Command:

Following that is a more realistic explanation of how to remotely open closed ports, wipe traces of your presence, etc.

Completing this webpage will turn a boolean variable to "1" in the SQL database.

“Implementation and Testing”: defense & home.html

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Listen up, username! Some hacker is trying to get to hack into one of our wiretap servers! Get a shell running and kick them out!

Command out! --Now the user will be on the CIA's side, and is trying to keep the server from being hacked into.--

--This webpage will make heavy use of timers. The user will need to run a shell in the wiretap server, and type "trap" at the right moment to kick the intruder out before they gain superuser access.--

--Doing so will mark the other boolean variable to '1'. Having both of these set to '1' will allow the user to navigate to webpage "why.html".--

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Welcome to the roughest of rough drafts for "Hacknet, Real-Life Hacking, And You". When this website is complete, visitors will be able to experience a pared-down version of Hacknet.

In other words, they will use a command-line interface to "hack" into a remote server. In truth, they will just be entering strings into a text box, and if they enter the correct strings, they will "succeed."

At this point, they will get to watch some videos and read about real-life hacking, and how it is different from the game's version of hacking. A similar demonstration will occur with cyberdefense.

In Hacknet, you also defend your own terminal, in addition to hacking others. After successfully entering the correct string at the correct moment to "fend off an attack", they will be shown real-life methods.

Once both show as complete (perhaps by updating a boolean value in the MySQL database to "1"), they will be shown the webpage "why.html." If attack.html and defense.html are the body of the essay, then "why.html" is the conclusion. It will summarize the information learned in the previous webpages, lay out why this information matters, and provide links to learn more about cybersecurity.

The SQL database will hold information about each new visitor. Whenever someone opens home.html from a webpage that isn't from http://localhost/HIRLHaY (name pending, and also not a localhost), they are prompted to enter a username. If the username already exists in the database, the user is asked if they would like to start over. If they say yes, they may complete the challenges in "attack.html" and "defense.html" again.

If they say no, then they may navigate the website freely, without needing to complete the challenges first. And if the username doesn't exist in the database, then they will play through the site as intended.

“Implementation and Testing”: About_Us & why.html

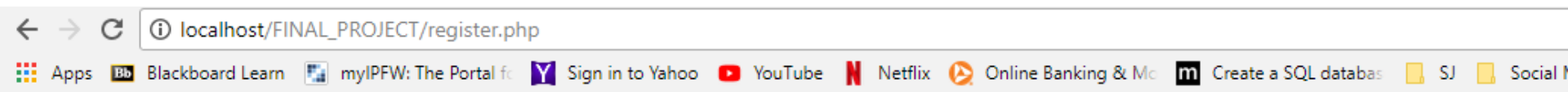
[Home](#)
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[Why](#)

This webpage will be a quick summary of who Logan Grannis is, and how he definitely doesn't own the trademark for the Steam game "Hacknet", and copyright law blah blah blah

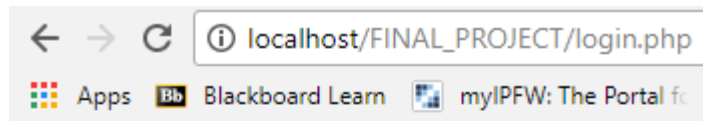
[Home](#)
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Here will be an impassioned case to convince the visitor/user to take up the cause of cybersecurity, or at least take steps to improve their personal security measures. A third SQL boolean variable will be set to '1', which will mark this username as having completed the course, and will allow them full access.

“Implementation and Testing”: register & login.php



“Implementation and Testing”: register & login.php



Login

Please fill in your credentials to login.

Username:*

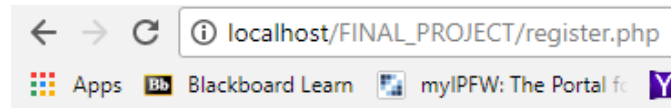
localhost

Password:*

.....

Submit

Don't have an account? [Sign up now.](#)



Sign Up

Please fill this form to create an account.

Username:*

Password:*

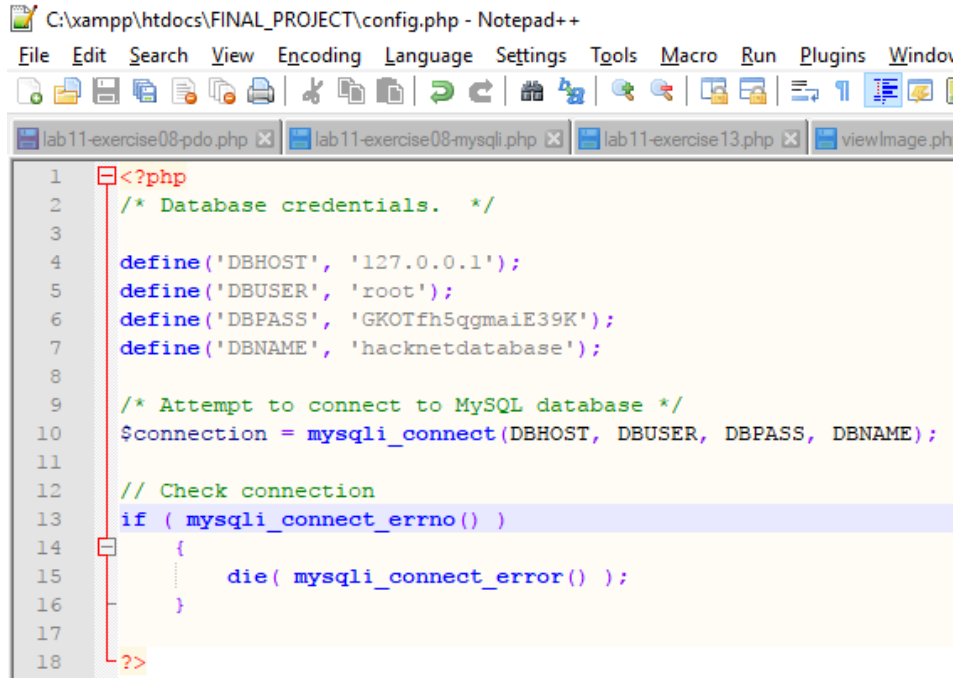
Confirm Password:*

Submit

Reset

Already have an account? [Login here.](#)

“Implementation and Testing”: config.php code



```
1 <?php
2 /* Database credentials. */
3
4 define('DBHOST', '127.0.0.1');
5 define('DBUSER', 'root');
6 define('DBPASS', 'GKOTfh5qgmaiE39K');
7 define('DBNAME', 'hacknetdatabase');
8
9 /* Attempt to connect to MySQL database */
10 $connection = mysqli_connect(DBHOST, DBUSER, DBPASS, DBNAME);
11
12 // Check connection
13 if ( mysqli_connect_errno() )
14 {
15     ..... die( mysqli_connect_error() );
16 }
17
18 ?>
```

“Implementation and Testing”: attack.html code

```
C:\xampp\htdocs\FINAL_PROJECT\attack.html - Notepad++
File Edit Search View Encoding Language Settings Tools Macro Run Plugins Window ?
Nb11-exercise08.php Nb11-exercise09-mysql.php Nb11-exercise13.php viewimage.php home.html attack.html
1 <!DOCTYPE html>
2 <html lang="en">
3 <head>
4 <meta charset="utf-8">
5 <meta name="viewport" content="width=device-width, initial-scale=1.0">
6 <title>Attack</title>
7
8 <!-- Bootstrap core CSS -->
9 <link href="bootstrap3_defaultTheme/dist/css/bootstrap.css" rel="stylesheet">
10
11 <!-- Custom styles for this template -->
12 <link href="chapter08-project02.css" rel="stylesheet">
13
14 <!-- HTML5 shim and Respond.js IE8 support of HTML5 elements and media queries -->
15 <!--[if lt IE 9]>
16 <script src="../../assets/js/html5shiv.js"></script>
17 <script src="../../assets/js/respond.min.js"></script>
18 <![endif]-->
19
20 <style>
21     a:link {
22         text-decoration: underline;
23         color: blue;
24     }
25     a:visited {
26         text-decoration: underline;
27         color: purple;
28     }
29     a:hover {
30         text-decoration: none;
31         font-weight: bold;
32     }
33     a:active {
34         background-color: yellow;
35     }
36
37     body {
38         background-image: url("C:/xampp/htdocs/FINAL_PROJECT/mr16urn0.png");
39     }
40
41     p1
42     {
43         color: aqua;
44         background-color: black;
45         size: 20px;
46     }
47
48     /* The Modal (background) */
49     .modal {
50         display: none; /* Hidden by default */
51         position: fixed; /* Stay in place */
52         z-index: 1; /* Sit on top */
53         padding-top: 100px; /* Location of the box */

```

```

55 top: 0;
56 width: 100%; /* Full width */
57 height: 100%; /* Full height */
58 overflow: auto; /* Enable scroll if needed */
59 background-color: rgb(0,0,0); /* Fallback color */
60 background-color: rgba(0,0,0,0.4); /* Black w/ opacity */
61 }
62
63 /* Modal Content */
64 .modal-content {
65     background-color: #fefefe;
66     margin: auto;
67     padding: 20px;
68     border: 1px solid #888;
69     width: 80%;
70 }
71
72 /* The Close Button */
73 .close {
74     color: #aaaaaa;
75     float: right;
76     font-size: 28px;
77     font-weight: bold;
78 }
79
80 .close:hover,
81 .close:focus {
82     color: #000;
83     text-decoration: none;
84     cursor: pointer;
85 }
86
87 </style>
88
89 </head>
90
91 <body>
92     <nav>
93         <ul>
94             <li><a href="http://localhost/FINAL_PROJECT/home.html">Home</a></li>
95             <li><a href="http://localhost/FINAL_PROJECT/about_us.html">About Us</a></li>
96             <li><a href="http://localhost/FINAL_PROJECT/attack.html">Attack</a></li>
97             <li><a href="http://localhost/FINAL_PROJECT/defense.html">Defense</a></li>
98             <li><a href="http://localhost/FINAL_PROJECT/why.html">Why</a></li>
99         </ul>
100     </nav>
101     <p style="color:red; background-color: black">Welcome, username. We need you to hack into the CIA and steal some wiretap recordings for us. Any will do.<br>
102     To do so, navigate to this IP Address: 124.42.38.567. Once there, probe their defenses, get in, download the recordings, wipe the /log directory clean, and get out.<br>
103     Then, upload the files to our filedump server.<br>
104     Command out.<br><br>
105     --Textbox will appear in the middle of the page. First, the user should type "connect 124.42.38.567". Then, they should type "probe", which will reveal a closed port 80 and closed port 1443.--<br>
106     --They should then type "HTTPPerack 80" and "SQL_MemCorrupt 1443". These should open the ports. Then, they type "porthack", which will grant the user superuser access.--<br>
107     --Now they will be presented with a few folders: /home, /log, /sys, /bin, and /wiretap.records. The user should type "mv wiretap_records", and then "scp wiretap_001".--<br>
108     --Now they type "od.." to move back to viewing all the folders. Then, "od log" to move to the log folder, and "rm *" to wipe all traces of their presence. Then, "disconnect" to leave the CIA server.--<br><br>

```

```

110 </p>
111
112 <!--Game UI.-->
113 <p id="game_attack" style="color:aqua; background-color:black"></p>
114 <p id="tutorial_text" style="color:aqua; background-color:black"></p>
115 C:\Users\username: <input type="text" id="cmd_prompt" name="cmd_prompt" value="">
116 <button id="cmdBtn">Send Command</button>
117 <!-- The Modal -->
118 <div id="errorModal" class="modal">
119
120 <!-- Modal content -->
121 <div class="modal-content">
122 <span class="close"><i>times</i></span>
123 <p>Incorrect input. Check spacing, capitalization, and spelling.</p>
124 </div>
125
126 </div>
127
128 <!--The game is here.-->
129 <script>
130 var startString = "Local Terminal | IPv4 Address: 149.105.1.053";
131 var startPrompt = "Type \"connect\" followed by the CIA IP address provided to you.";
132 document.getElementById("game_attack").innerHTML = startString;
133 document.getElementById("tutorial_text").innerHTML = startPrompt;
134 <!-- An integer that records the user's progress in the attack game. -->
135 var progress = 0;
136
137 // Get the modal
138 var modal = document.getElementById("errorModal");
139
140 //Get the modal button
141 var btn = document.getElementById("cmdBtn");
142
143 // Get the <span> element that closes the modal
144 var span = document.getElementsByClassName("close")[0];
145
146 // When the user clicks the button, open the modal
147 btn.onclick = function() {
148 modal.style.display = "block";
149
150 // When the user clicks on <span> (x), close the modal
151 span.onclick = function() {
152 modal.style.display = "none";
153
154 // When the user clicks anywhere outside of the modal, close it
155 window.onclick = function(event) {
156 if (event.target == modal) {
157 modal.style.display = "none";
158 }
159 }
160
161 btn.onClick = function()

```

```

163 {
164 if (document.getElementById(cmd_prompt).value!="connect 124.42.39.567")
165 { modal.style.display = "block";
166 else if (document.getElementById(cmd_prompt).value=="connect 124.42.39.567")
167 {
168 document.getElementById("game_attack").innerHTML = "Remote Server | IPv4 Address: 124.42.39.567";
169 document.getElementById("tutorial_text").innerHTML = "Type \"probe\" to scout the server's defenses.";
170 progress = 1;
171 }
172 }
173 }
174 </script>
175 <p style="color: black; background-color: cyan">Following that is a more realistic explanation of how to remotely open closed ports, wipe traces of your presence, etc.</p>
176 <p style="color: cyan">Completing this webpage will turn a boolean variable to "1" in the SQL database.</p>
177 </body>

```


Lessons Learned

- Process of creating a web site is laborious and time-consuming
- Any task will be at least twice as complex as initially believed
- Procrastination should be kept to a minimum, if not avoided outright
 - Can ask for help sooner that way
- Always be social and make friends in class who can explain things to you
 - A partner would have been invaluable for this project.

Conclusion

- Thought project would teach me more about cybersecurity
- Project actually helped me learn a great deal about:
 - Teamwork (or the lack thereof)
 - Web Systems (and the design thereof)
- Hopefully, will utilize lessons learned in the future
 - Start projects sooner; use free time to dabble in any ongoing projects

References

- Hosting, SiteGround. Web. “How to Create Database with PhpMyAdmin Tutorial.” SiteGround, 12 Mar 2014. Web. Retrieved 05 December 2017.
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- HTML5, CSS, JavaScript, PHP Tutorial. (N.D.). Retrieved 9 December 2017.
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