



Sri Lanka Institute of Information Technology
Year 3 – Semester 2



Information Security Project (IE3092)
Capture the Flag Tournament (CTF 2020)
Mid Review

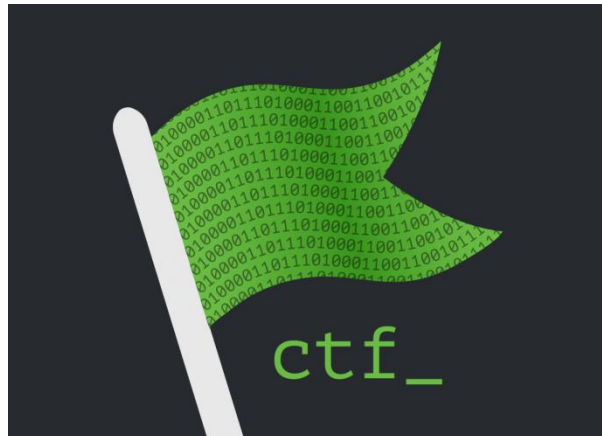
IT18120462 – Abisheka P. A. C.

IT18152456 – Karunathilake K. K. H.

Contents

1. Introduction	3
2. Scenario and Theme	4
3. Architecture.....	5
4. Game Structure.....	6
5. Drill Plan.....	7
6. Audience	8
7. Budget Plan	9
8. Market Plan	10
9. Business Value	11
10. Time Line.....	12
11. Weekly Progress.....	13
a) Week 1	13
b) Week 2.....	14
c) Week 3	17
d) Week 4.....	19
e) Week 5	22
f) Week 6	25
g) Week 7.....	27

1. Introduction



What is a CTF?

CTF (Capture The Flag) is a kind of information security competition that challenges contestants to solve a variety of tasks ranging from a scavenger hunt on Wikipedia to basic programming exercises, to hacking your way into a server to steal data. In these challenges, the contestant is usually asked to find a specific piece of text that may be hidden on the server or behind a webpage. This goal is called the flag, hence the name!

There are 3 main types of CTF's out there namely jeopardy style, attack-defense style and mixed. Jeopardy style CTFs provide a list of challenges and award points to individuals or teams that complete the challenges, groups with the most points wins.

Attack/Defense style CTFs focus on either attacking an opponent's servers or defending one's own. These CTFs are typically aimed at those with more experience and are conducted at a specific physical location.

Mixed is a combination of both Jeopardy and Attack/Defense styles.

2. Scenario and Theme

Our CTF box is based on J.K Rowling's Harry Potter Universe. Harry Potter is a series of fantasy novels written by British author, J. K. Rowling. The novels chronicle the lives of a young wizard, Harry Potter, and his friends Hermione Granger and Ron Weasley, all of whom are students at Hogwarts School of Witchcraft and Wizardry. The series was later made into 8 movies which are popular all around the world.



Our CTF is called “Accio Flags!” and the word “Accio” means “I summon” in Latin. So the meaning of our CTF name is “I summon Flags”.

Harry Potter along with his friends Ron and Hermione go through various challenges in order to destroy the evil dark wizard Lord Voldemort. To defeat him, Harry has to find and destroy 7 Horcruxes. A Horcrux is an object formed by dark magic that is used by a wizard or witch to achieve immortality by splitting a dark wizard's soul into separate pieces.

We created this CTF based on the 7 Horcruxes. Your mission is to collect all 7 Horcruxes in order to defeat Lord Voldemort.

3. Architecture

- The CTF is created as a Web Application
- Operating system - Linux in which the ova file is compatible with Oracle VM Virtualbox
- Server- Apache Server
- OS – Ubuntu Server 16.4
- IDE – Notepad++ / Visual Studio Code
- The CTF box will require the following specifications:
 1. 1 core CPU
 2. 1512MB RAM
- The VM will be set to a bridged network adapter by default.
- The VM will acquire IP by default.
- Each section has 2 levels:
 - 1st level → Finding the horcrux
 - 2nd level → Destroy the horcrux
- The final level is level 15.
- Includes a total of 15 levels.
- Estimated time taken to finish the CTF - 9 hours.
- The levels include challenges from different aspects of information security such as
 1. Cryptography
 2. SQL injection
 3. Cross site scripting
 4. Social Engineering
 5. Digital Forensics
 6. Programming
 7. Steganography

GitHub Link: <https://github.com/Himashi-Karunathilake/Accio-Flags>

YouTube Link: <https://www.youtube.com/c/ChamodiPitumpe>

4. Game Structure

There are 7 categories namely,

- Horcrux 1 The Diary
- Horcrux 2 The Ring
- Horcrux 3 The Cup
- Horcrux 4 The Locket
- Horcrux 5 The Diadem
- Horcrux 6 Harry Potter
- Horcrux 7 The Snake

Each category has 2 Levels. To go to the next level, the flag from the previous level is needed. When you complete 2 levels from each Horcrux category, you will collect the flag that will let you destroy that Horcrux. The objective is to collect all the flags from 14 levels. The final level is level 15 where you have to collect the flag by combining 2 flags from the previous levels.

The 14 levels are created under 7 categories as follows

Horcrux 1 The Diary	Horcrux 2 The Ring	Horcrux 3 The Cup	Horcrux 4 The Locket	Horcrux 5 The Diadem	Horcrux 6 Harry Potter	Horcrux 7 The Snake
The Diary - Discover	The Ring - Discover	The Cup - Discover	The Locket - Discover	The Diadem - Discover	Harry Potter - Discover	The Snake - Discover
The Diary - Destroy	The Ring - Destroy	The Cup - Destroy	The Locket - Destroy	The Diadem - Destroy	Harry Potter - Destroy	The Snake - Destroy

5. Drill Plan

It is important to thoroughly test the application before deployment. Our drill plan consists penetration tests done first by our team members to discover weaknesses and to know the flow of the CTF.

It consists of 2 stages.

- Testing the web application.
- Testing the web application after integrating it with the virtual machine.

Then by using members of the targeted audience to get their feedback. For this we plan to use a team of 2nd and 3rd year undergraduate students who will have to complete their internships.

6. Audience

The main audience is cyber security intern recruiters. Cyber Security interns are being recruited more than before by companies due to the rapid growth in the field of information security. However, there is no proper interviewing process to check the skills of potential interns. Therefore, this CTF is aimed at assessing their skills. Challenges will be given and the time taken to solve the CTF will be measured. Employees will be able to assess the skills of potential recruits. The uniqueness of this CTF is that many areas of cyber security will be assessed.

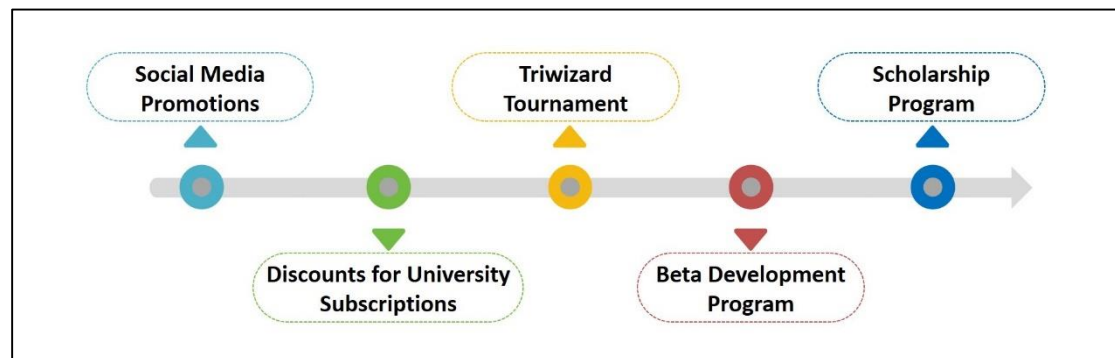
We also have a secondary audience. There are a growing number of Information Security degrees offered by universities. However, students don't always understand what "Information Security" is before joining degree programs and they often ask their peers what information security exactly means and what information security professionals do. Our aim is to target undergraduate students who have an interest in having a career in the field of information security and who are interested in specializing in cyber security as the secondary audience. By participating in this CTF they will be able to get a clear understanding on the principals of information security and the methods and techniques used. It provides them a way to have fun while learning a vast amount of new knowledge.

7. Budget Plan

PROJECT STAGE	UNIT PRICE (\$)	QTY	TOTAL
Documentation	\$3.00	1	\$3.00
Task Designing	\$5.00	1	\$5.00
Development	\$30.00	1	\$30.00
Testing	\$5.00	1	\$5.00
Data Cost	\$25.00	4	\$100.00
Scope Cost	\$3.00	1	\$3.00
Web Hosting Cost	\$8.00	6	\$48.00
Total			\$194.00

Budget for 6 months

8. Market Plan



“Accio Flags!” has its own website. In order to spread awareness regarding this project, social media platforms such as Twitter and Facebook will be used. Additionally, the product will be promoted via advertisements in YouTube.

This CTF box is open to anyone to try. Individuals can purchase the CTF box for \$9.99 where as if a university decide to purchase this for a number of individuals at once, a discount of 15% will be given.

After the initial release of “Accio Flags!”, a selected batch from a particular university will be able to participate in a CTF challenge named “Triwizard Tournament”. Here, the top three students will be granted a special opportunity.

The top three students selected from the Triwizard Tournament will be able to participate in the Beta Development Program. Additionally, when other top candidates appear, they too will be granted the opportunity to participate in the Beta Development Program.

The participants who actively participate in the Beta Development Program will be granted a scholarship.

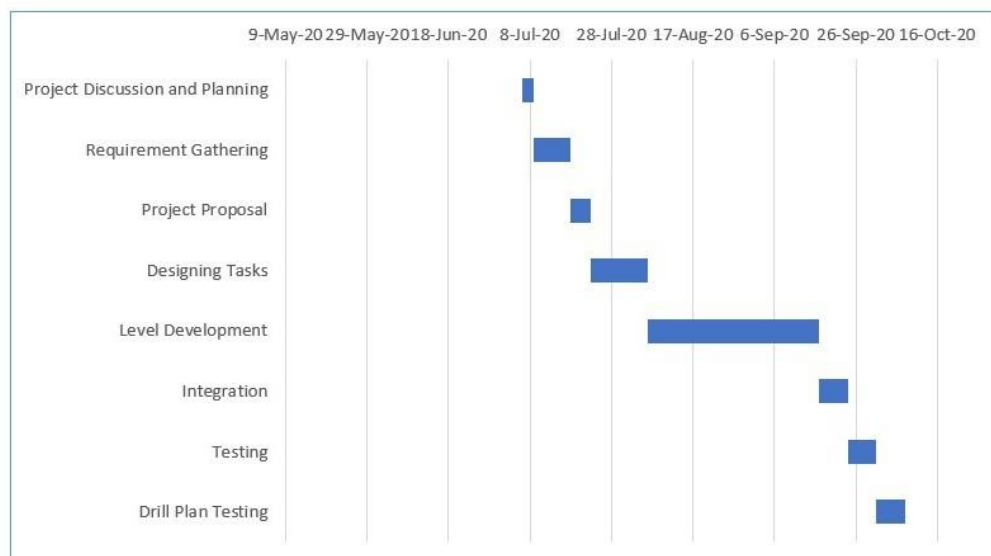
9. Business Value

We estimate that “Accio Flags!” has a value of around 500 USD. This includes the Web Application, domain and the Server.

10. Time Line

The following Gantt Chart shows the work plan that describes the amount of work to be done throughout the semester.

TASK	TIME ALLOCATION
Project Discussion and Planning	Week 1
Requirement Gathering	Week 2
Project Proposal	Week 3
Designing Tasks	Week 4 – Week 5
Level Development	Week 6 – Week 11
Integration	Week 12
Testing	Week 13
Drill Plan Testing	Week 14



11. Weekly Progress

a) Week 1

Designing the Website I

Since our CTF is web based, we need a website to include level instructions and to provide a platform for players to submit flags.

In the first week, we designed a web page with sections to include an introduction page, about us page, contact us page and a catalog section.

As our theme is based on the Harry Potter universe, we designed a logo using the signature Harry Potter font. We also selected the name “Accio Flags” as Accio is a spell used in Harry Potter and it means “Summon”, basically meaning that we will be summoning flags through this box.



It is a fully responsive Bootstrap website. CSS was added to make it attractive.

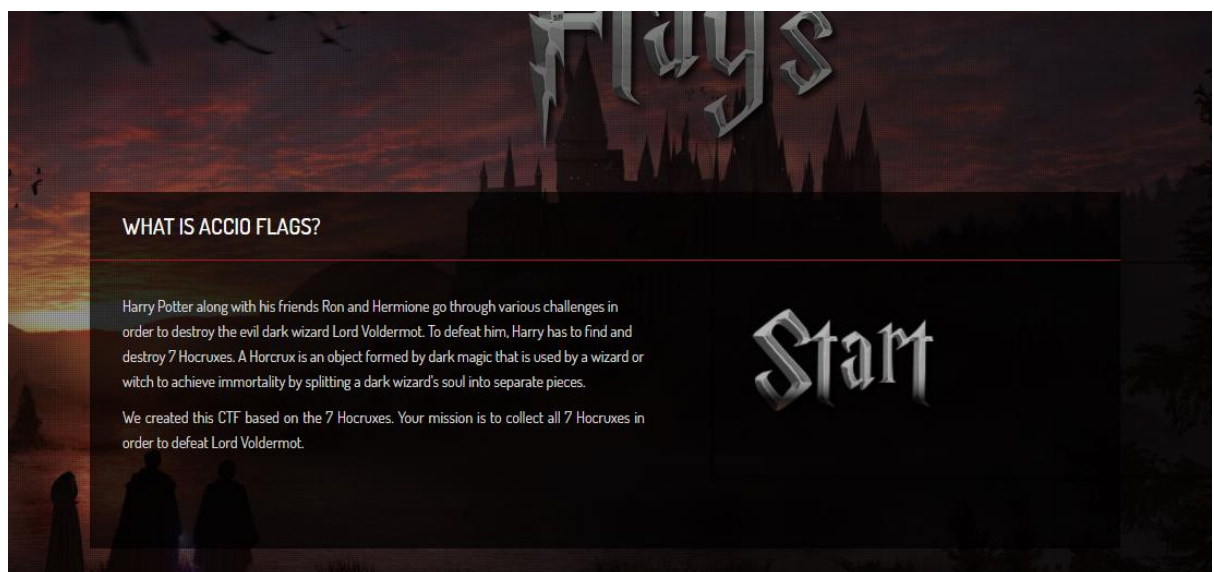
In addition to these, research was done about possible CTF challenge ideas that can be included in our CTF.

b) Week 2

Designing the Website II

Added more CSS to the website and added details to different sections.

```
61
62 h1 {
63     font-size: 2em;
64     margin: 0.67em 0;
65 }
66
67 abbr[title] {
68     border-bottom: 1px dotted;
69 }
70
71 b,
72 strong {
73     font-weight: bold;
74 }
75
76 dfn {
77     font-style: italic;
78 }
79
80 hr {
81     -moz-box-sizing: content-box;
82     box-sizing: content-box;
83     height: 0;
84 }
85
86 mark {
87     background: #ff0;
88     color: #000;
89 }
90
```

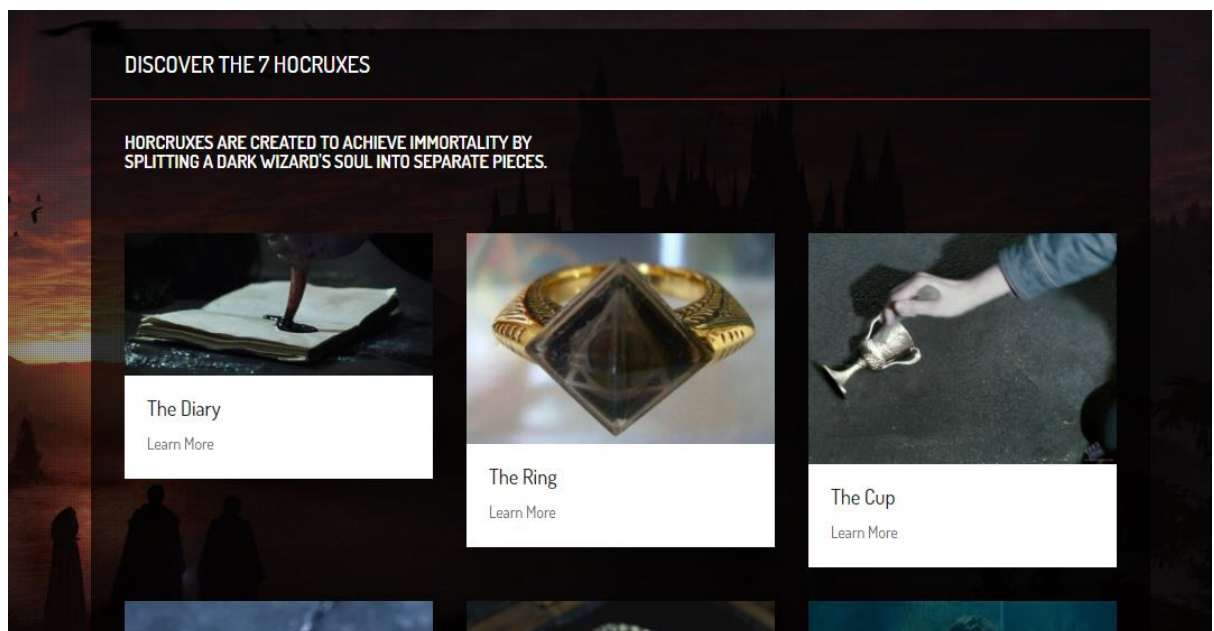


```

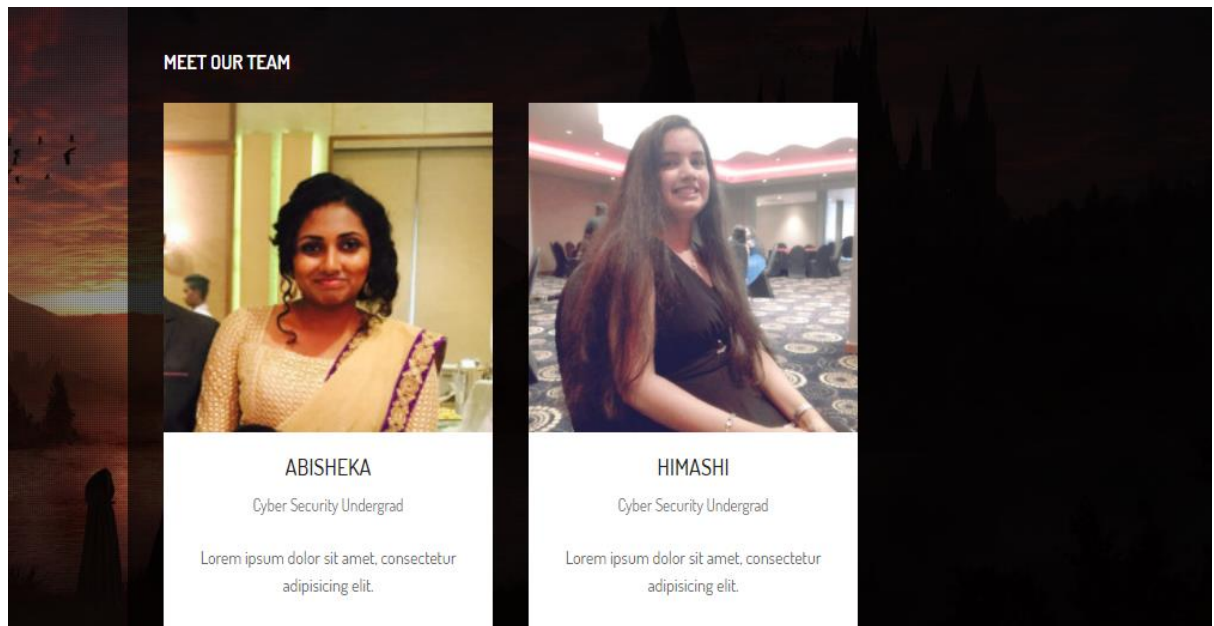
1 <!DOCTYPE html>
2 <html class="no-js" lang="en"> <!--<![endif]-->
3 <head>
4   <title>Genius - HTML5 Website Template</title>
5   <meta name="viewport" content="width=device-width, initial-scale=1.0">
6   <meta name="description" content="">
7 <!--
8 Genius Template
9 http://www.templatemo.com/tm-402-genius
10 -->
11   <meta name="author" content="templatemo">
12   <meta charset="UTF-8">
13   <link href='http://fonts.googleapis.com/css?family=Dosis:300,400,500,600,700,800' rel='stylesheet' type='text/css'>
14
15   <!-- CSS Bootstrap & Custom -->
16   <link href="bootstrap/css/bootstrap.css" rel="stylesheet" media="screen">
17   <link href="css/font-awesome.min.css" rel="stylesheet" media="screen">
18   <link rel="stylesheet" href="css/templatemo_misc.css">
19   <link rel="stylesheet" href="css/animate.css">
20   <link href="css/templatemo_style.css" rel="stylesheet" media="screen">
21
22   <!-- Favicons -->
23   <link rel="shortcut icon" href="images/ico/favicon.ico">
24
25   <!-- JavaScripts -->
26   <script src="js/jquery-1.10.2.min.js"></script>
27   <script src="js/modernizr.js"></script>
28   <!--[if lt IE 8]>
29   <div style=' clear: both; text-align:center; position: relative;'>
30     <a href="http://www.microsoft.com/windows/internet-explorer/default.aspx?ocid=ie6_countdown_bannercode"></a>

```

Our CTF is based on destroying the 7 horcruxes in order to win. So here we included a section providing facts about the horcruxes. A player who is new to the Harry Potter universe can get an idea about it from here.



We included a section about the developers of the CTF



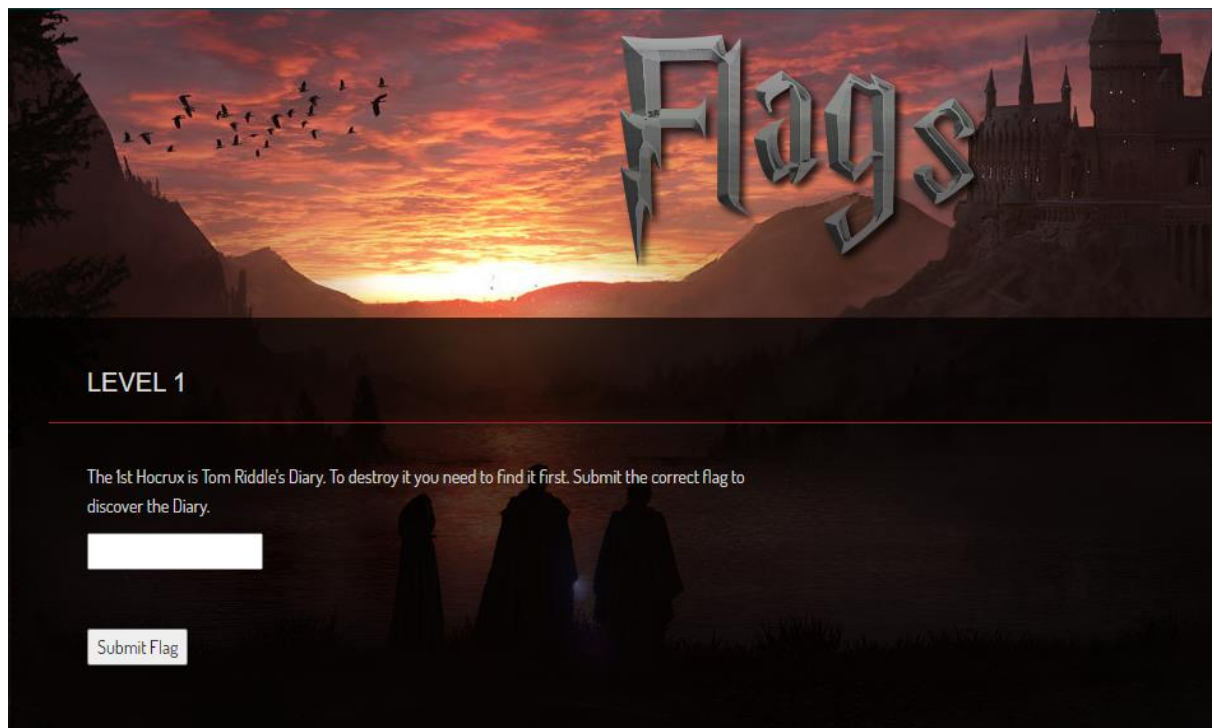
Finally, a feedback form for players to send us their feedback or ideas was created.

c) Week 3

Creating Standalone Levels I

Starting from this week we will be creating standalone levels. They will be combined in the end according to the complexity.

To get started we decided to make level 1 easy and straightforward. It is made in a way any player is capable of getting the flag.



The player has to go to the source code. At first we considered directly including flag as a comment but decided to check player's knowledge on number systems to increase the difficulty.

```

        <h2 style="text-align:left" class="page-title">Level 1</h2>
    </div> <!-- /.page-header -->
    <div class="row">

        <div class="col-md-7">
            <div class="content-inner">

                <p style="text-align:left">The 1st Hocrux is Tom Riddle's Diary. To destroy it you need

                    <!-- Flag is 53454354554d53454d505241 -->
                    <form method="post" action="/template/level_comment.php">
                        <input type="text" name="flag" autocomplete="off"><br> <br><br>
                        <input type="submit" name="submit" value="Submit Flag"><br>
                    </form>
                    <br><br>

                </div>

            </div>


        </div> <!-- /.row -->
    </div> <!-- /.homepage -->

```

The flag is provided. But, if the player tries to submit this flag it says that the flag is wrong. By looking at the flag it can be observed that it is in hexadecimal format.

Hence by using a hex to string converter, obtain the flag.

Enter the hexadecimal text to decode


[get sample](#)


53454354554d53454d505241

Convert

Load

Browse

The decoded string:



SECTUMSEMPRA

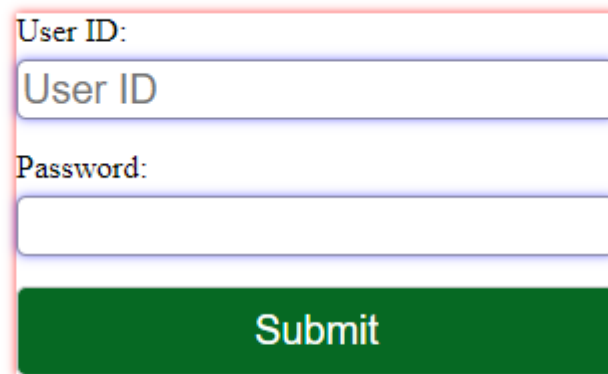
The flag will only work if it is entered in all capital letters.

d) Week 4

Creating Standalone Levels II

Since SQL injection is a very common attack and all information security personnel must be aware on how to prevent it, a level that exploits SQL injection vulnerable form was created.

When creating this level, several difficulties were faced due to wrong SQL syntaxes that were used. Finally, we were able to solve them using help of online forums.



The image shows a login form with a red border. It contains two input fields: 'User ID' and 'Password'. The 'User ID' field has the text 'User ID' inside it. Below the 'Password' field is a green 'Submit' button.

\

A simple form is given. If wrong data is entered, an error message will be shown.

Invalid user id or password

By looking at the source code, the player can see that the SQL injection prevention techniques such as input validation, parametrized queries, stored procedures and escaping have not been used.

```

13  /* Database Credentials. Assuming you are running MySQL
14  server with default setting (user 'root' with no password) */
15  define('DB_SERVER', 'localhost');
16  define('DB_USERNAME', 'root');
17  define('DB_PASSWORD', '');
18  define('DB_NAME', 'hr');
19
20  /* Attempt to connect to MySQL database */
21  $con = mysqli_connect(DB_SERVER, DB_USERNAME, DB_PASSWORD, DB_NAME);
22
23  // Check connection
24  if($con === false){
25      die("ERROR: Could not connect. " . mysqli_connect_error());
26  }
27  ?>
28
29  <?php
30
31  $uid = $_POST['uid'];
32  $pid = $_POST['passid'];
33  $SQL = "select * from user_details where userid = '$uid' and password = '$pid' ";
34  $result = mysqli_query($con,$SQL);
35
36  if(mysqli_num_rows($result)>0){
37      echo "<h4>". "--- Personal Information -- </h4>",
38      "<br>";
39      while ($row=mysqli_fetch_row($result)){ echo "
40  <p>".
41      "User ID : ".
42      $row[0].
43      "</p>";
44      echo "<p>".

```

The player has to try and access all records in the database.

If the player provides **abcd** as **userid** and **anything' or 'x'='x** as password, then the query will be constructed as follows:

\$SQL = "select * from user_details where userid = 'abcd' and password = 'anything' or 'x'='x' ";

Based on operator precedence, the WHERE clause is true for every row, therefore the query will return all records.

-- Personal Information --

User ID : scott123

Password : 123

First Name : Scott Last Name : Ray

Gender : M Date of Birth : 2020-07-08

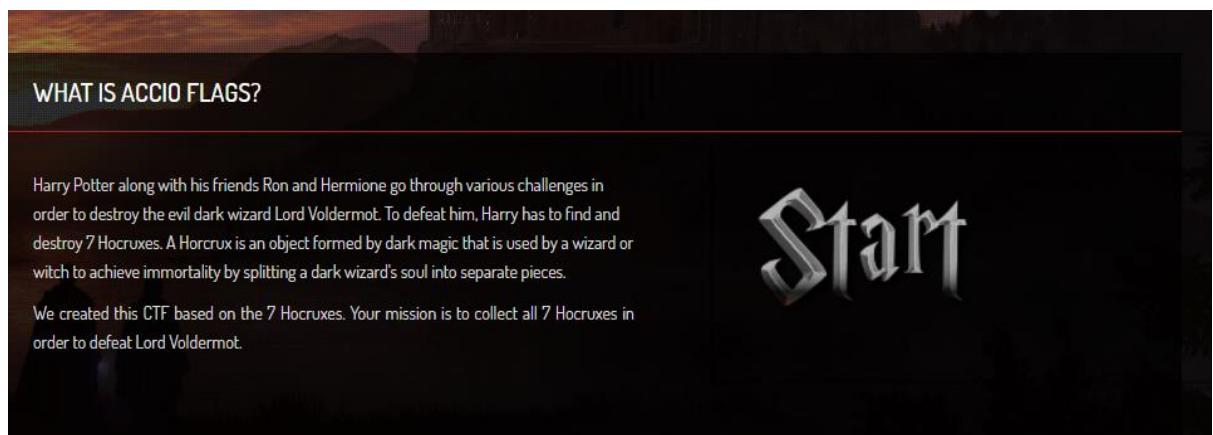
Country : UK User rating : 55

Email ID : a@a.com

More records will be added including the flag when the CTF is implemented in Ubuntu server and when the database is made.

Additionally, some changes were made to the last week's website.

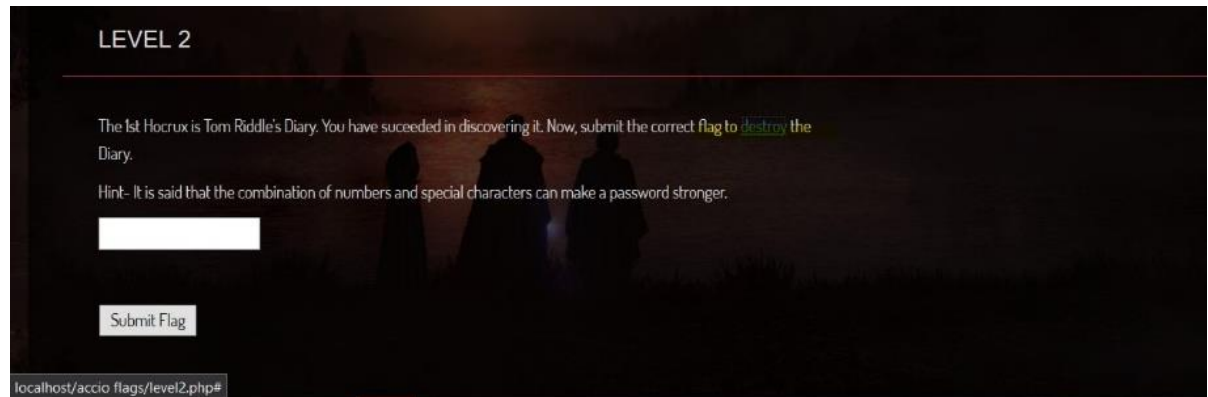
Also, included a start button that redirects to level 1.



e) Week 5

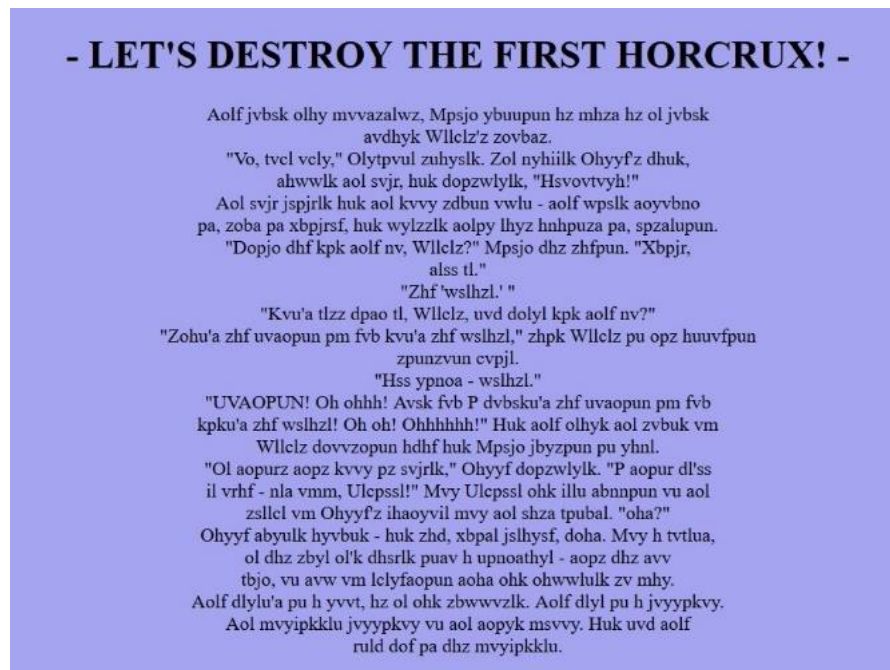
Creating Standalone Levels III

After successfully completing the previous level, the user will be navigated to the next level. There, a link to destroy the obtained horcrux will be obtained.



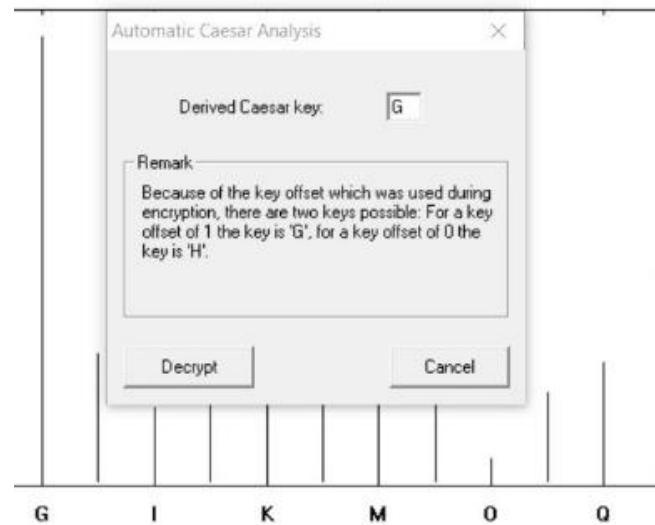
Once you click on that link, you will be navigated to another webpage.

Here, you will be required to perform a letter frequency analysis with Caesar Cipher on the text given using a software like CrypTool.



Here, you will see that the derived Caesar key is "G". Save this for later use and proceed to decrypt the given text.

irrelation of the distributions <Unnamed1> and <english.txt>



Here, you can see a passage derived from Harry Potter book 1. Go through the passage and find the spell used.

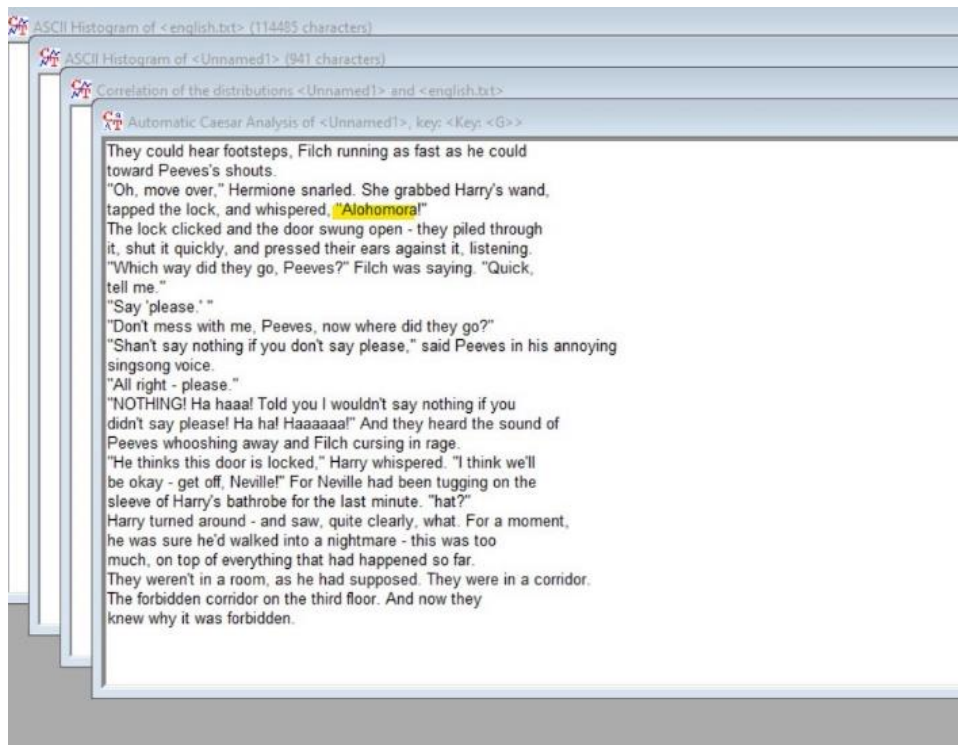
ASCII Histogram of <Unnamed1> (941 characters)

Correlation of the distributions <Unnamed1> and <english.txt>

Automatic Caesar Analysis of <Unnamed1>, key: <Key: <G>>

They could hear footsteps, Filch running as fast as he could toward Peeves's shouts.
"Oh, move over," Hermione snarled. She grabbed Harry's wand, tapped the lock, and whispered, "Alohomora!"
The lock clicked and the door swung open - they piled through it, shut it quickly, and pressed their ears against it, listening. "Which way did they go, Peeves?" Filch was saying. "Quick, tell me."
"Say 'please.'"
"Don't mess with me, Peeves, now where did they go?"
"Shan't say nothing if you don't say please," said Peeves in his annoying singsong voice.
"All right - please."
"NOTHING! Ha haaa! Told you I wouldn't say nothing if you didn't say please! Ha ha! Haaaaaa!" And they heard the sound of Peeves whooshing away and Filch cursing in rage.
"He thinks this door is locked," Harry whispered. "I think we'll be okay - get off, Neville!" For Neville had been tugging on the sleeve of Harry's bathrobe for the last minute. "hat?"
Harry turned around - and saw, quite clearly, what. For a moment, he was sure he'd walked into a nightmare - this was too much, on top of everything that had happened so far.
They weren't in a room, as he had supposed. They were in a corridor. The forbidden corridor on the third floor. And now they knew why it was forbidden.

Press F1 to obtain help.

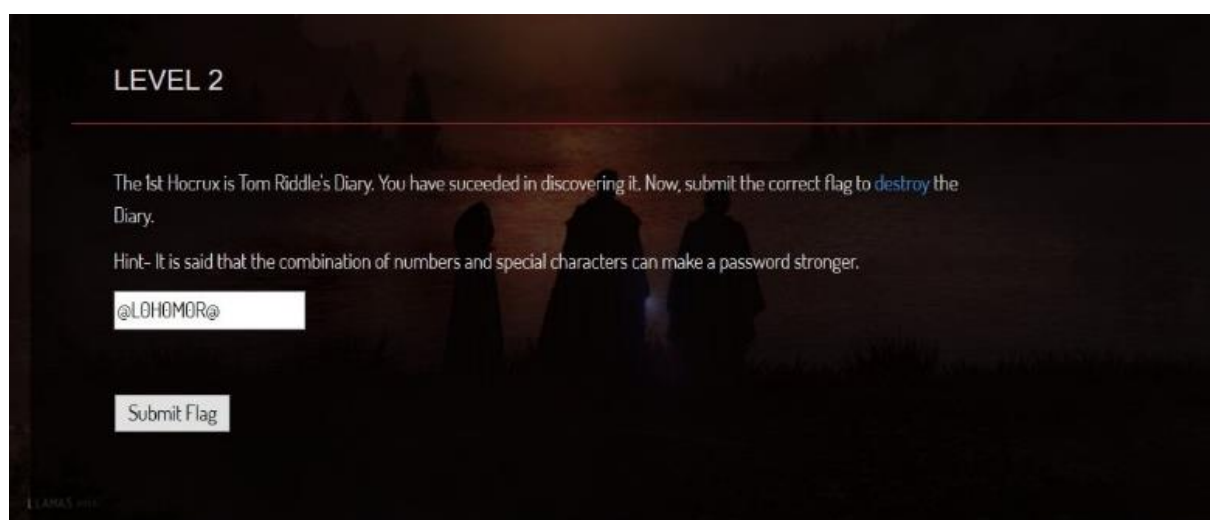


Combine the spell with all possible characters and numbers and brute force to capture the flag.

Save the flag for later use.

Obtained spell: Alohomora

Flag: @L0H0M0R@



f) Week 6

Creating Standalone Levels IV

The aim of this level is to test a player's knowledge on base64 encoding and decoding.

The player could first go to the source code and there in the meta tags, he will be able to see two attributes called "hint" and "ctf" in two different meta tags.

```
1 <html>
2 <head>
3   <title>Genius - HTML5 Website Template</title>
4   <meta name="viewport" content="width=device-width, initial-scale=1.0" hint="VGhlIGZsYWcgY291bGQgY29udGFpbiBzcGVjaWFsIGNoYXJhY3RlcnMgdG9vISA7KQ==">
5   <meta name="description" content="" ctf="P61ldGEgbnFtZT0iZmlzaHkgZmlzaHkiIGZsYWc9IkhlcmlucyBhIGxpc3Qgb2Ygc3RlbGxzIGZvcjB5b3U6IEF2SNZPc1MsIEJhbmJ7bGw7dXMsIEFyYU5pYySBFeHA
6
```

As it can be seen, the values of the attributes are both encoded in base64. The player could use an online base64 decoder for this and initially decode the hint.

Decode from Base64 format
Simply enter your data then push the decode button.

VGhlIGZsYWcgY291bGQgY29udGFpbiBzcGVjaWFsIGNoYXJhY3RlcnMgdG9vISA7KQ==

For encoded binaries (like images, documents, etc.) use the file upload form a bit further down on this page.

UTF-8

Source character set.

☐

Decode each line separately (useful for multiple entries).

☒ Live mode OFF

Decodes in real-time when you type or paste (supports only UTF-8 character set).

< DECODE >

Decodes your data into the textarea below.

The flag could contain special characters too! ;)

The hint says that the flag could contain special characters as well. Now, the player can proceed to decode the hint.

Decode from Base64 format

Simply enter your data then push the decode button.

PG1ldGEgdmFtZT0iZmlzaHkgZmlzaHkiGZsYWw9IkhlcmlUncyBhIGxp3Qgb2Ygc3BibGxzIGZvciB5b3U6IEF2SWZPcmlsIEJhVWJlbGxJdXMsIEFyYU5pYSBFHVNYWksIEJyQWNLaXVNIETW5EbywgQ29sbE9zaG9PliA+Cg==

i For encoded binaries (like images, documents, etc.) use the file upload form a bit further down on this page.

UTF-8

Source character set.

☐ Decode each line separately (useful for multiple entries).

☒ Live mode OFF

Decodes in real-time when you type or paste (supports only UTF-8 character set).

< DECODE >

Decodes your data into the textarea below.

<meta name="fishy fishy" flag="Here's a list of spells for you: AvlOrS, BaUblIllus, AraNia ExuMai, BrAckiuM EmEnDo, CollOsho O" >

Decode files from Base64 format

The decoded tag gives a list of possible flags and the player is required to brute force them by combining with special characters to obtain the flag.

The correct combination is: @r@Ni@ ExuM@i

However, this will not be accepted since this level is about base64 encoding and decoding. Therefore, the player will have to encode the above value in base64 to obtain the correct flag.

The flag: QHJATmlAIEV4dU1AaQ==

g) Week 7

Creating Standalone Levels V

Since our main audience is cyber security intern recruiters, we figured out that they will need to know basic cyber hygiene related questions. Therefore, this level was created as a quiz. Initially, the player will have to click on the link to navigate to the page with the quiz.

The 2nd HocruX is Marvolo Gaunt's Ring. To destroy it you need to find it first. Submit the correct flag to discover the Ring.

Hint- Base64 is a group of binary-to-text encoding schemes that represent binary data in an ASCII string format by translating it into a radix-64 representation.

Submit Flag

- Welcome to Defense Against the Dark Arts Module! -

VghlGhvcmlNvdXggd2lobCBiZSBYzXZiYWxkZC00byB5b3Ugc29vbi4=

Rmlyc3QqdGFzSB0aGzFlNFVLEgUXVpei4=

SWYgYWxkIGFuc3JlcnMgYXJlIGNvenJlY3QsIHVudSB3aWxkGjJlGdpcmVudHRoZSB0aW50IHJlcXVpemVklHRvIG9idGFpb0aGUgZmxhZy4=

- Security Education, Training and Awareness (SETA) Quiz -

1. V2hhdCBpcyB0aGUgU0VUQSbWcm9ncmF0GRlc2lnbmVldHRvIGRvPw==

- ☐ A) Reduce the occurrence of external attacks
- ☐ B) Reduce the occurrence of accidental security breaches
- ☐ C) Increase the efficiency of InfoSec staff
- ☐ D) Improve operations

2. QSBTRVRBIBHyb2dyY29uc2lzdHMcHg2YgdGltYzWUgZWxlbWVudHM6IHNIY3Y3YaXR5IGVkdWNoHGhwiGvc2VjdXJpdHkgdHJlW5pbmc3GFuZCB3aGJjaCBvZiB0aGUgZm93bG93aW5uPw==

- ☐ A) Security accountability
- ☐ B) Security awareness
- ☐ C) Security authorization
- ☐ D) Security authentication

3. VghlIHBBInBvc2Ug2YgU0VUQSbWcm9ncmF0byBibmhhbmNlIHNIY3Y3YaXR5IGluGFsbCBidXQgd2hpY2ggb2YgdGhlIGZvbGxwd2lnZyB3YXJlZPw==

- ☐ A) By building in-depth knowledge
- ☐ B) By developing skills
- ☐ C) By improving awareness
- ☐ D) By adding barriers

4. V2hpY2ggb2YgdGhlIGZvbGxwd2lnZyBpcyBbbiBhZHZhbnRhZ2Ug2YgdGhlIG9uZS1vbGlubmUgbWV0aG9kIG9mIHByYXWlwaW5uPw==

- ☐ A) Maximizes use of company resources
- ☐ B) Trainees can learn from each other
- ☐ C) Customized
- ☐ D) Very cost-effective

As it can be seen here, the quiz has 5 questions. However, the instructions and the questions are all base64 encoded. Therefore, they have to be decoded as a first step.

Decode from Base64 format


Simply enter your data then push the decode button.

Rmlyc3QgdGFrZSB0aGZlIFNFVEEgUXVpei4=

i For encoded binaries (like images, documents, etc.) use the file upload form a bit further down on this page.

UTF-8  Source character set.

☐ Decode each line separately (useful for multiple entries).

 Live mode OFF Decodes in real-time when you type or paste (supports only UTF-8 character set).


< DECODE > Decodes your data into the textarea below.

First take this SETA Quiz.

Decode from Base64 format


Simply enter your data then push the decode button.

SWYgYWxsIGFuc3dlcnMgYXJlIGNvcnJlY3QsIHlvdSB3aWxsIGJlIGdpdmVulHRoZSB0aW50IHJlcXVpcmVkiHRvIG9idGFpbiB0aGUgZmxhZy4=

 For encoded binaries (like images, documents, etc.) use the file upload form a bit further down on this page.

UTF-8  Source character set.

☐ Decode each line separately (useful for multiple entries).

 Live mode OFF Decodes in real-time when you type or paste (supports only UTF-8 character set).

< DECODE > Decodes your data into the textarea below.

If all answers are correct, you will be given the hint required to obtain the flag.

The player is required to decode each and every question and give the correct answer and submit the form.

If incorrect answers are given, an error message will be given.

Results

3 / 5 correct

Not all your answers are correct. Please try again.


Once the correct answer is given, the hint regarding the flag will be given, also encoded in base64.

Results

5 / 5 correct


RHVtYmxlZG9yZSBpcyBodXJ0ISBvc2UgdGhlIHNoZWxsIGZvciBtaW5vciBpbmp1cmllcyEh

RHVtYmxlZG9yZSBpcyBodXJ0ISBvc2UgdGhlIHNoZWxsIGZvciBtaW5vciBpbmp1cmllcyEh

 For encoded binaries (like images, documents, etc.) use the file upload form a bit further down on this page.

UTF-8  Source character set.

☐ Decode each line separately (useful for multiple entries).

 Live mode OFF Decodes in real-time when you type or paste (supports only UTF-8 character set).

< DECODE > Decodes your data into the textarea below.

Dumbledore is hurt! Use the spell for minor injuries!!

Decode files from Base64 format

Select a file to upload and process, then you can download the decoded result.

This hint means that the flag would be related with the spell for minor injuries. This spell was hidden in the source code of a previous level.

```
</div>
</div>
</div> <!-- /.row -->
</div> <!-- /.homepage -->

<!-- If you get injured in this journey, use "Episkey" which is a spell that can heal relatively minor injuries. Stay Safe! -->
```

The spell is “Episkey!”. However, this will not work. Therefore, the flag will be the base64 encoded version of the spell.

The flag: RXBpc2tleSE