



UNIVERSITEIT VAN PRETORIA  
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YUNIBESITHI YA PRETORIA

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## USER MANUAL

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PROJECT NAME: ARCANE ARCADE

CLIENT: TONY VD LINDEN

TEAM NAME: TERABITES

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# 1 Introduction

The project is called *Arcane Arcade*, which references the esoteric language users will have to use, as well as the gamification aspect.

It is used by employers to determine the level of skills and classification if potential employees.

This document presents the Arcane Arcade system, it's uses and how it is to be put to use.

## 2 Project Background

This section outlines the background behind the project Arcane Arcade.

### 2.1 Problems Experienced

The software engineering industry have tried various models over the years to ascertain whether a prospective employee has the required skills or aptitude to be a valuable software developer. These range from automated online screening assessments that pushes the boundaries of the person's intellectual capability, to manually executed proprietary company tests using specific programming languages to test development competencies. Online assessments are popular and easy to execute, but lacks the insight provided by manual and proprietary testing of how the candidate reasons, where manual and proprietary testing is time-consuming and expensive to execute. In addition, company proprietary tests become stale and are leaked into the industry reducing the value tests may have.

BBD have used both approaches over the years and has found that online assessments are adequate when the prospective employee has little to no professional development experience. This is however not enough to demonstrate software development capability for existing professional developers and the company was forced to create a programming test for this group of people. These days, it is becoming difficult to maintain a landscape for an array of different programming languages used by BBD, while ensuring that the quality is maintained.

## 2.2 Arcane Arcade as the Solution

The candidate is presented with a problem and must use an unfamiliar and custom esoteric programming languages (esolang) to solve the problem. The test must make use of gamification principles such as making new keywords available that can be used in following challenges when a specific challenge is completed.

Each challenge is harder than the previous and all incorporate some programming principle such as general arithmetic, condition checking, iteration, recursion, functions and embedded functions. The platform must have the ability to interpret or compile the esolang and to allow the candidate to “run” the program. The platform must be available on-line or on a tablet device and be secure enough to disallow unauthorized use. The candidate will be emailed a link and a user-name to access the platform.

All the challenges are to be timed and all results and times must be persisted. Once the candidate completes the whole challenge or decides to stop before the last challenge, a final score is shown. The candidate cannot access the challenge again once it reaches this state. In addition to the challenge/game, an administrator must be able to manage users, questions, esolang keywords (dependent on time) and result on-line.

## 3 System Overview

The project is called the Arcane Arcade and the name references both gaming as well as esoteric (intended for or likely to be understood by only a small number of people with a specialized knowledge or interest, arcane: mysterious or understood by few) programming languages.

## 4 System Configuration

The system requires a Windows/Unix based host to run the server. This host must have the associated technologies installed (the installation of these technologies will be discussed). The host must be connected to the internet in order to allow any required dependencies to be installed and set up for the operating system environment. The configuration of the server requires an active internet connection to facilitate communication between the system and end users.

The types of data that will be communicated and stored will be in a PostgreSQL database. The challenges that are to be passed to the candidate’s system reside in the database, there will have to be retrieved for display in the pages. The levels and questions that the challenges entail will be stored too. The challenges that the system houses can be added to the home page by the administrator in order to populate the navigation bar and pages. The administrators are the only users who are able to edit any data in the database.

The candidate users will just be able to view the challenges on the page. The user's sign up information will also be stored and will be used on the user's profile page. Each user will only have access to their own information. The administrators, however, will be able to search for users and update their IDs or delete them from the system. The administrators will have access to the challenge history of each user in order to view their attempts and performance.

## 5 System Usage

Arcane Arcade is primarily accessed through a web browser. The system has different pages that outline the functionalities that the different types of users can access. The users can be either administrators or candidates.

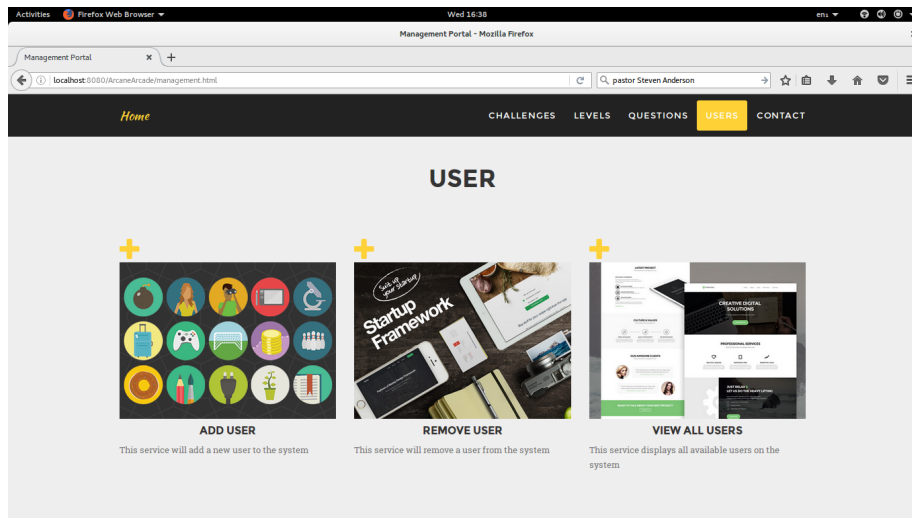
Administrators have global access to the whole system which also grants them management capabilities. The administrators can modify the structure of the challenges and how the candidates interact with the system controlling access, modifying questions, adding challenges, and others.

Candidates only have access to the challenges page and all-sub pages that can be found/clicked from that particular page.

## 5.1 Administrative Use

Arcane Arcade initially starts with a couple of administrator user accounts. These accounts have access to the management web page which can be used to cater for the following.

### 5.1.1 User Management



The very first section in the administration page is user management. This is used to manage the user accounts related to the system.

### 5.1.1.1 Add User

**ADD USER**

Name:

Surname:

Username:

Password:

Email Address:

Type of User:

☐ Player

☐ Admin

☐ SuperUser

**ADD USER**

Once the form is completely and correctly filled in and the type of user has been selected clicking on the Add User button creates the user account and the system will display an appropriate response.

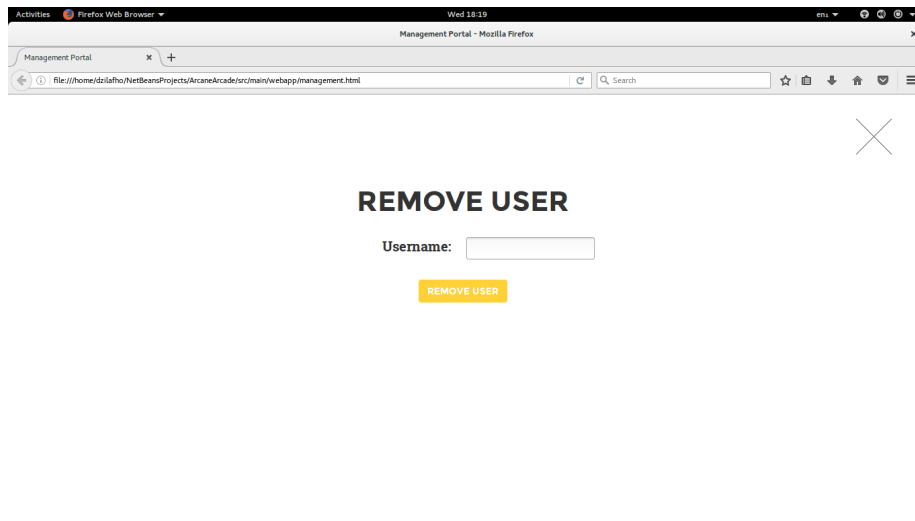
### 5.1.1.2 View Users

**ALL USERS**

Name	Surname	Username	email	User Type
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To view all the accounts which have access to the system, one has to click on the View Users.

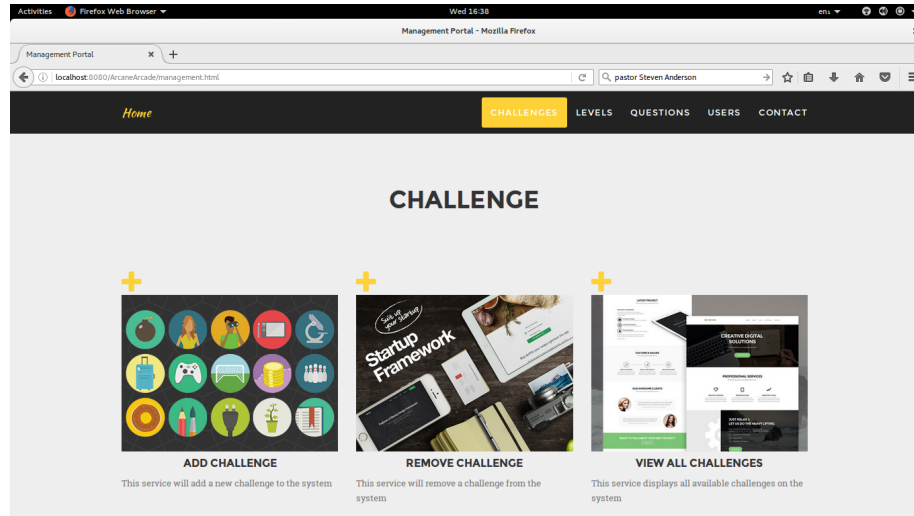
### 5.1.1.3 Remove User .



To remove an existing user, the administrator simply enters the person's special unique user-name in the field under a Remove User heading. If the specified user-name is associated with an account then the account is removed from the system and access is revoked.

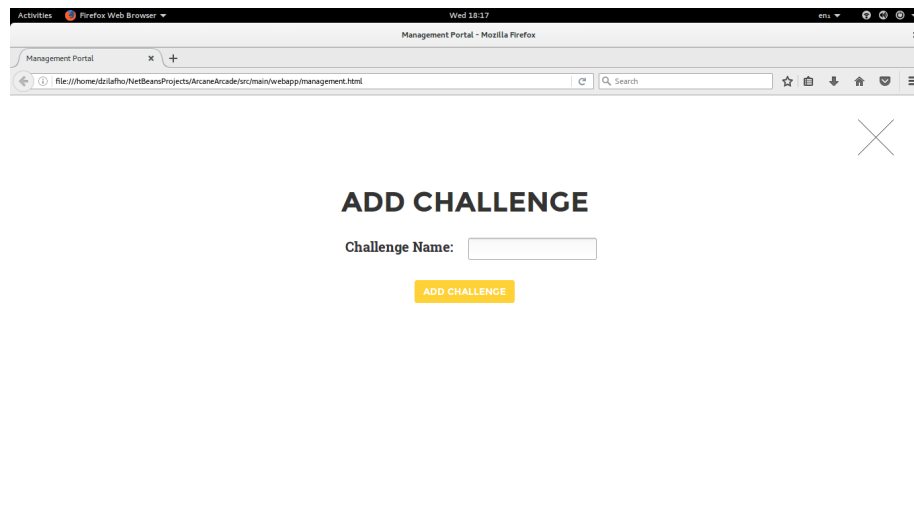


## 5.1.2 Challenge Management



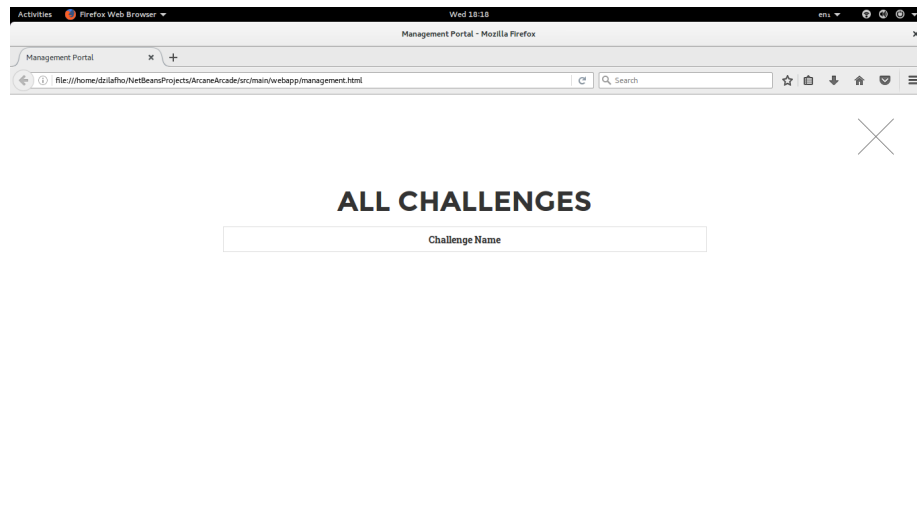
Challenges are the hosts of the smaller more interactive elements of the system. Challenges house the Levels which in turn house the Questions.

### 5.1.2.1 Add Challenge



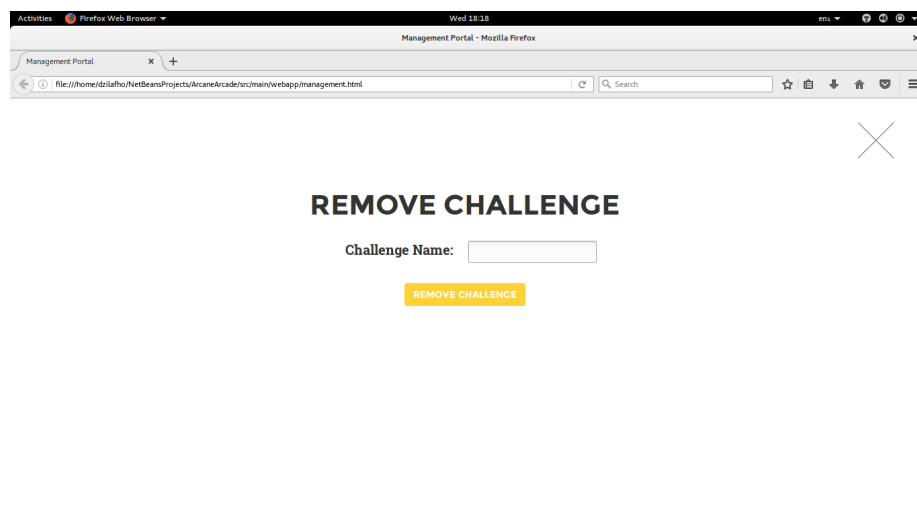
To add a new Challenge you simply specify the Challenge name and click on the Add Challenge button. This creates an empty challenge into which you can add levels.

### 5.1.2.2 View Challenges .



To view a list of all available challenges you would click on the View Challenges button.

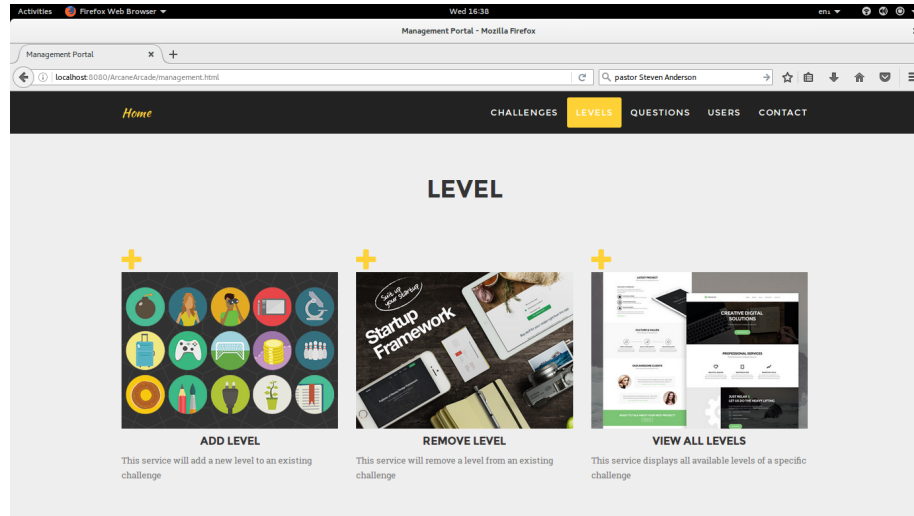
### 5.1.2.3 Remove Challenge .



Removing a non-empty Challenge removes also all it's levels and those levels' questions. You enter the name of the challenge and click on remove challenge.

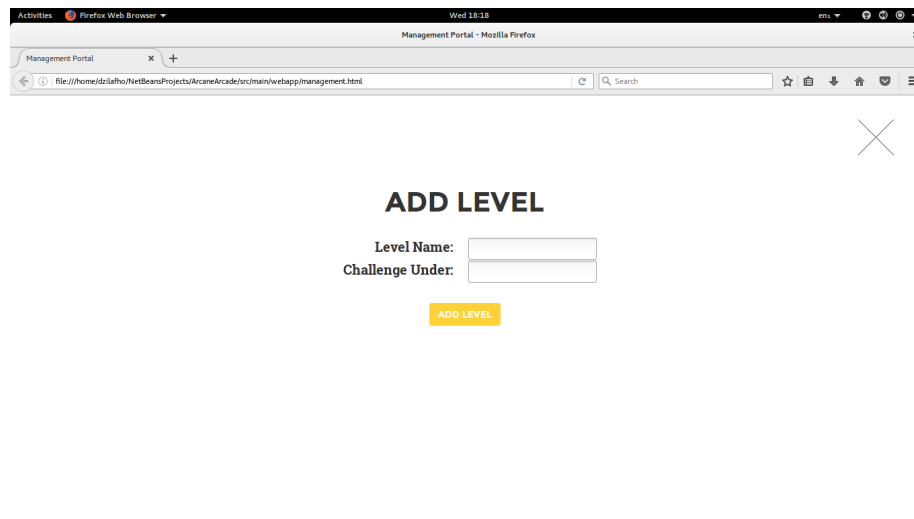


### 5.1.3 Level Management



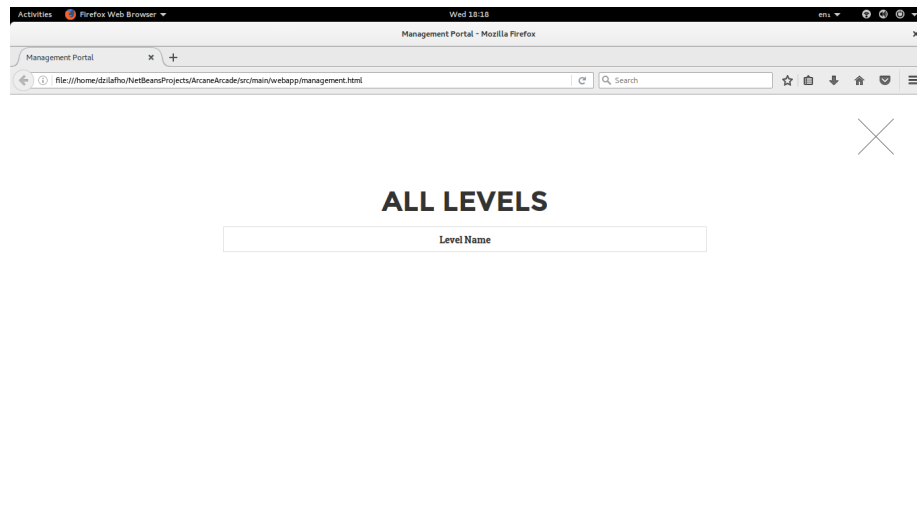
The very first section in the administration page is user management. This is used to manage the user accounts related to the system.

#### 5.1.3.1 Add Level



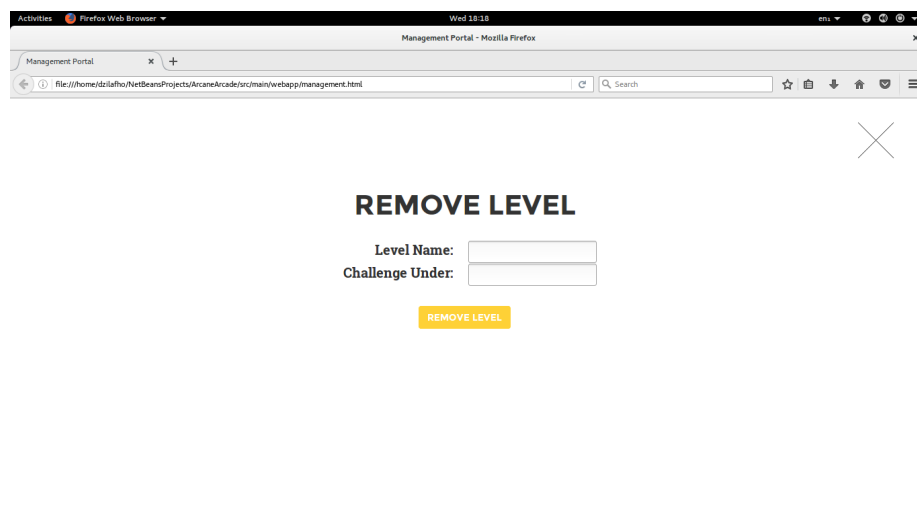
To add a new Level you fill in the form under Level Management by entering the name of the new Level and the Challenge that it falls under. Clicking the Add Level button adds the Level under the specified Challenge.

### 5.1.3.2 View Levels .



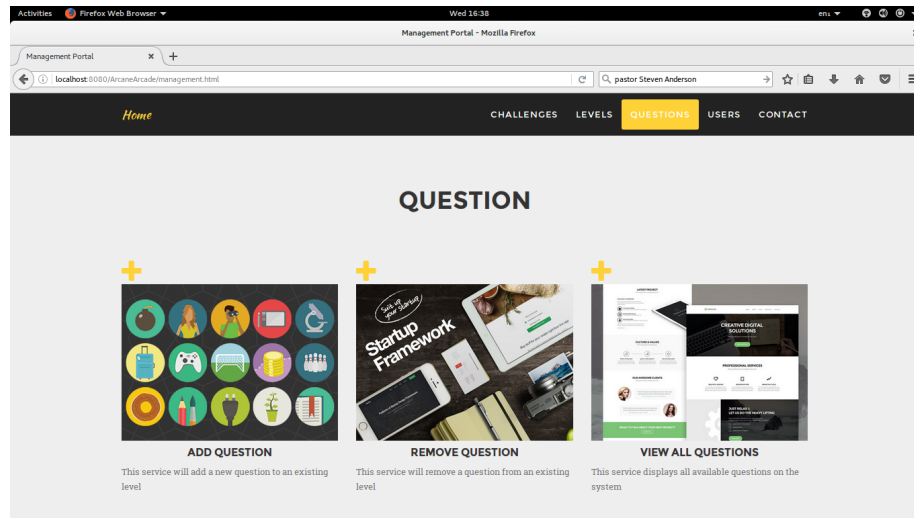
To view all the different Levels in table format you simply click the View all Levels button.

### 5.1.3.3 Remove Level .



To remove a Level you simply specify the name of the level then click on Remove Level. The level will then be removed from the Challenge which it was under.

### 5.1.4 Question Management

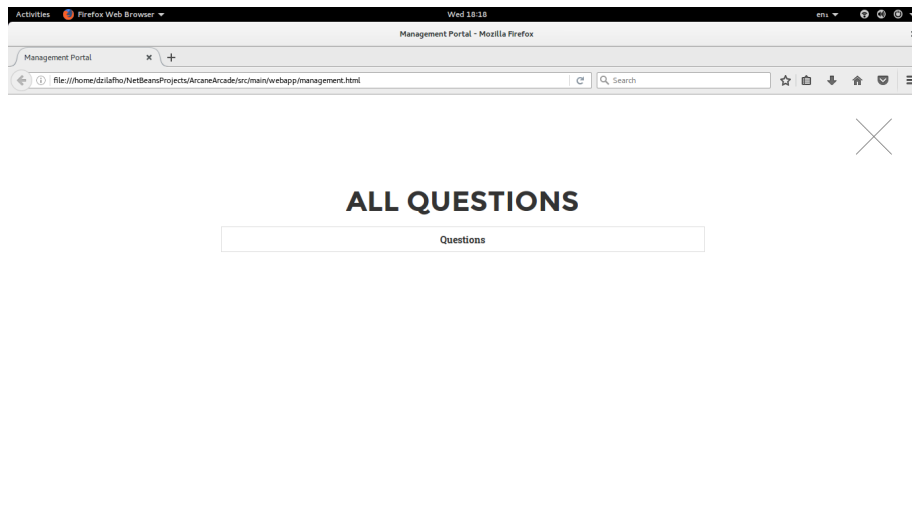


#### 5.1.4.1 Add Question

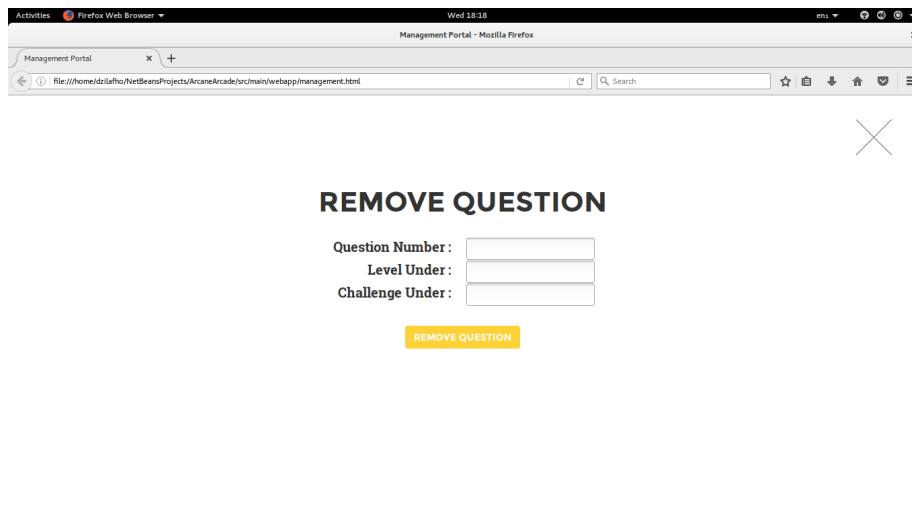
A screenshot of the 'ADD QUESTION' form in the Management Portal. The form is titled 'ADD QUESTION' and contains four input fields: 'Question:', 'Correct Answer:', 'Level Under:', and 'Challenge Under:'. Below the fields is a yellow 'ADD QUESTION' button. The form is displayed in a modal window with a close button (X) in the top right corner.

Adding a new question requires completion of the form under the Add Questions heading. The form has to be filled in completely and correctly, this is achieved by providing the Question, the Answer to the Question, the Level under which the question falls and the Challenge. Clicking on the Add Question button then puts it in the system accordingly.

#### 5.1.4.2 View Questions .



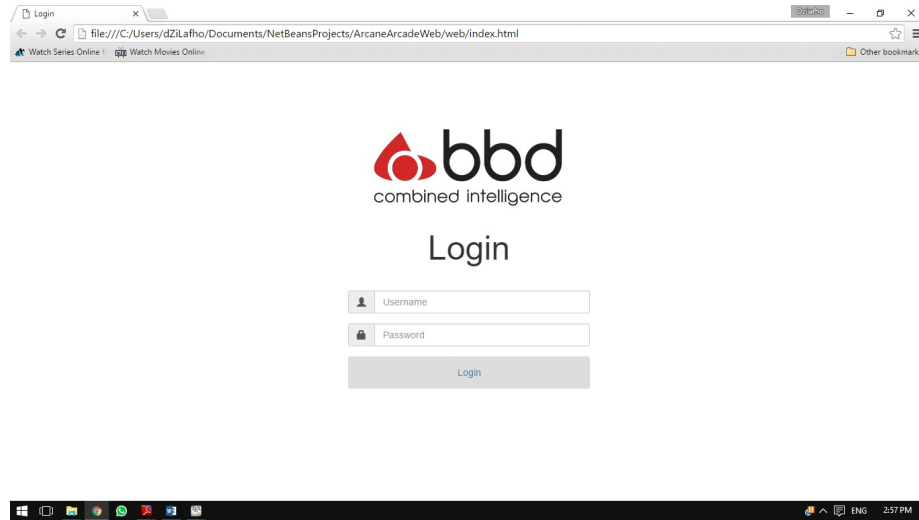
#### 5.1.4.3 Remove Question .



To view the list of all Questions in the system you click on the View Questions button.

## 5.2 Candidate Use

### 5.2.1 Login

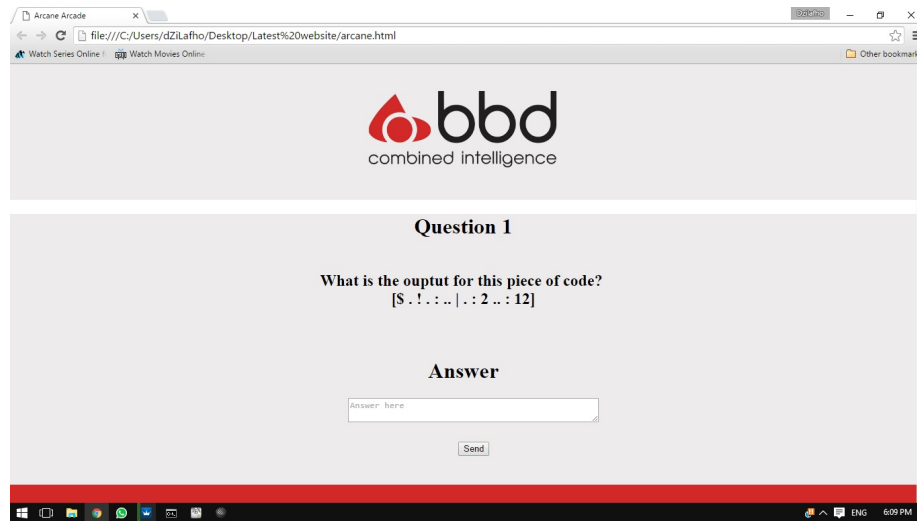


Upon opening the address to the Arcane Arcade system the user is greeted with a login screen. The login screen asks for the user's user-name and password.

You fill in the two fields with required registered information then click on the Login button to get access to the system.

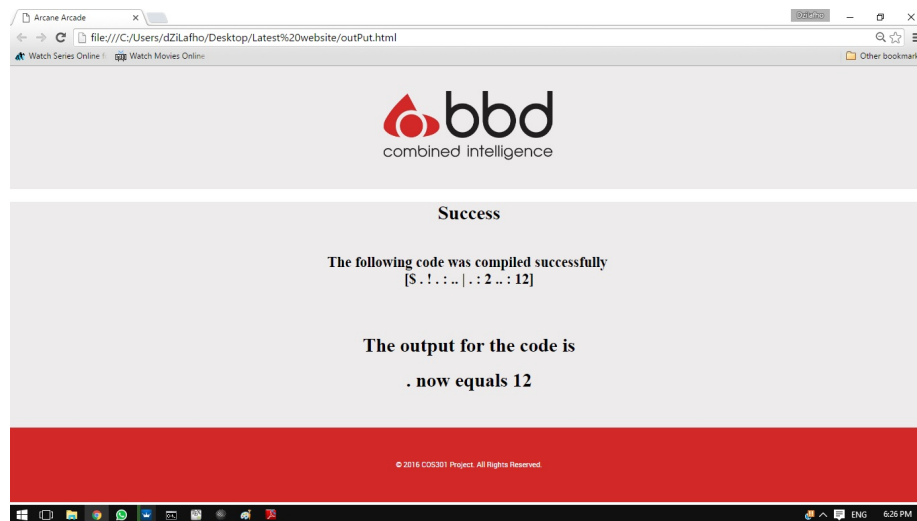


### 5.2.2 Answer Question



When the user successfully logs in they are directed to a menu which presents them with a question. The user has to then answer that question as it is used by typing in a series of character that is recognized as the Arcane Arcade esoteric language.

### 5.2.3 View Code Output



After inserting the question string it gets interpreted and executed. The result page then shows what the esoteric language question means in regular or well known syntax. The user has click on the send button in the middle of the screen.

## **6 Troubleshooting**

### **6.1 Administrative Problems**

### **6.2 Candidate Problems**