

**Software Test Report (STR)  
for the  
Computer Science Question Input and  
Delivery Template Manager (C-SQID-TM)**

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## Version History

Date	Version	Description	Authors
12/08/2020	1.0	Initial Version for Submission	Team

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# 1. Scope

## 1.1 Identification.

This Software Test Report pertains to the development of the Computer Science Question Input and Delivery Template Manager (C-SQID-TM) application and backend question database powering said application. The intended audience includes the engineers tasked with developing the application and its database as well as the test conductors responsible for the verification and acceptance of the application.

## 1.2 System overview.

The C-SQID-TM application can interface with the backend C-SQID-TM database to store, retrieve, and update the information within the database. The user can manually enter information to both store and retrieve information. The user may also submit a local document to be parsed and stored in the database. In addition, the application allows the user to input values into retrieved questions and save said questions locally without storing them in the database, and will allow the user to export this output to a separate file. The primary user for this application would be Computer Science professors and teaching assistants.

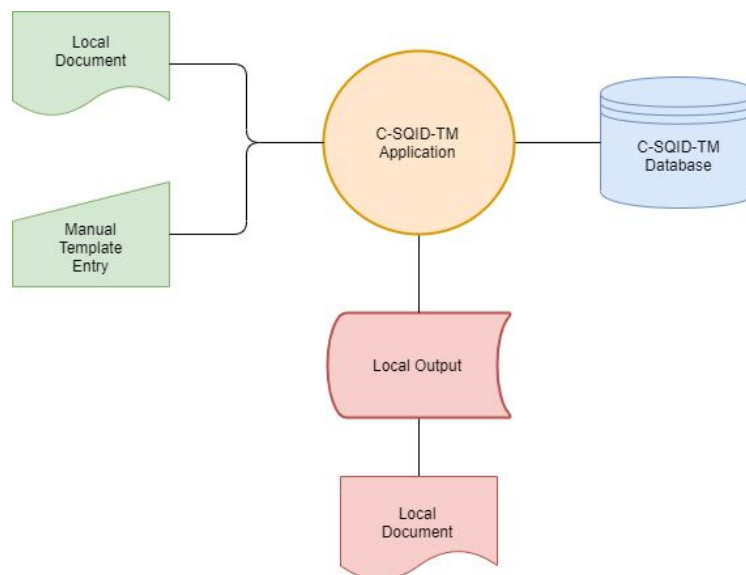
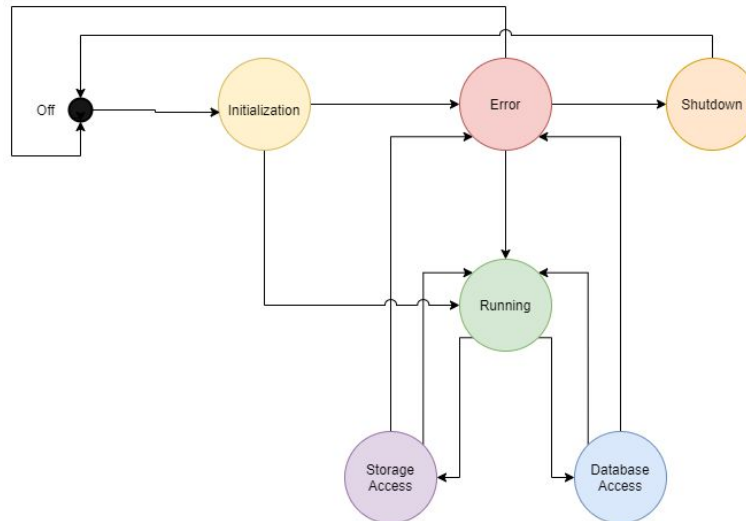


Figure 1. C-SQID-TM Interface

The software outlined in this STR is responsible for interfacing with the user's local machine as well as the C-SQID-TM database in order to store and retrieve information. The software's overall state transition is shown in Figure 2.



*Figure 2. C-SQID-TM State Diagram*

### 1.3 Document overview.

Section 1 describes the scope of the project. Section 2 provides the documents references. An overview of the testing results is provided in Section 3, with more in-depth information on testing located in Section 4. Section 5 contains the test log.

## 2. Referenced Documents

MIL-STD-498	Military Standard Software Development and Documentation
CMSC447-FA2020-G02-SDP-01A	Computer Science Question Input Template and Delivery Manager - Software Development Proposal
CMSC447-FA2020-G02-SRS-01A	Computer Science Question Input Template and Delivery Manager - Software Requirements Specification

CMSC447-FA2020-G02-SDD-01A	Computer Science Question Input Template and Delivery Manager - Software Design Document
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CMSC447-FA2020-G02-STP-01A	Computer Science Question Input Template and Delivery Manager - Software Testing Plan
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Documents pertaining to the development of C-SQID-TM can be found at our GitHub repository here: <https://github.com/rappleb1/software-development-447-project/tree/master/Documents>

### **3. Overview of Test Results**

The results of the tests described in the C-SQID-TM Software Test Plan are reported below.

#### **3.1 Overall assessment of software tested.**

After all the tests have been completed, it is safe to assume that the software performs efficiently and as designed. All of the test requirements that were mentioned in the Software Test Plan for this specific software, C-SQID-TM, checked out to be completed and there were not any deviations from the test plan. The software was able to utilize a database to store question templates, allow the user to retrieve, upload and modify, and only allow UMBC emails to be able to log in. There are some places where minor improvements can be made, however, no detrimental defects were found during the testing process.

#### **3.2 Impact of test environment.**

All tests for C-SQID-TM took into account that the user could be using either a Windows or Mac operating system from a Google Chrome or Microsoft Edge web browser. A huge impact would be if the database address is incorrect, then the user would not be able to access the software application, this was seen as a result during the connectivity test.

#### **3.3 Recommended Improvements.**

The only improvement noted is when the user uploads a .txt document of question templates. The software needs to be able to parse the document better so that the questions are not stored as a single string, but as separate questions.

### **4. Detailed Test Results**

The detailed results of all tests are included in this section.

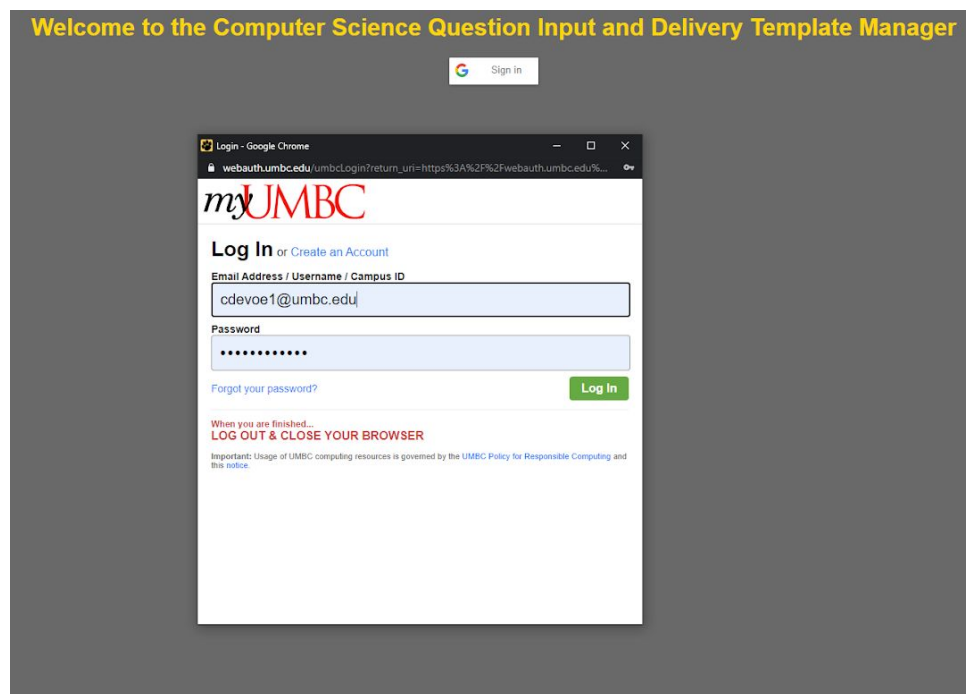
#### **4.1 Security Test**

The application security checks to ensure that no user with the wrong credentials should be allowed to access the database.

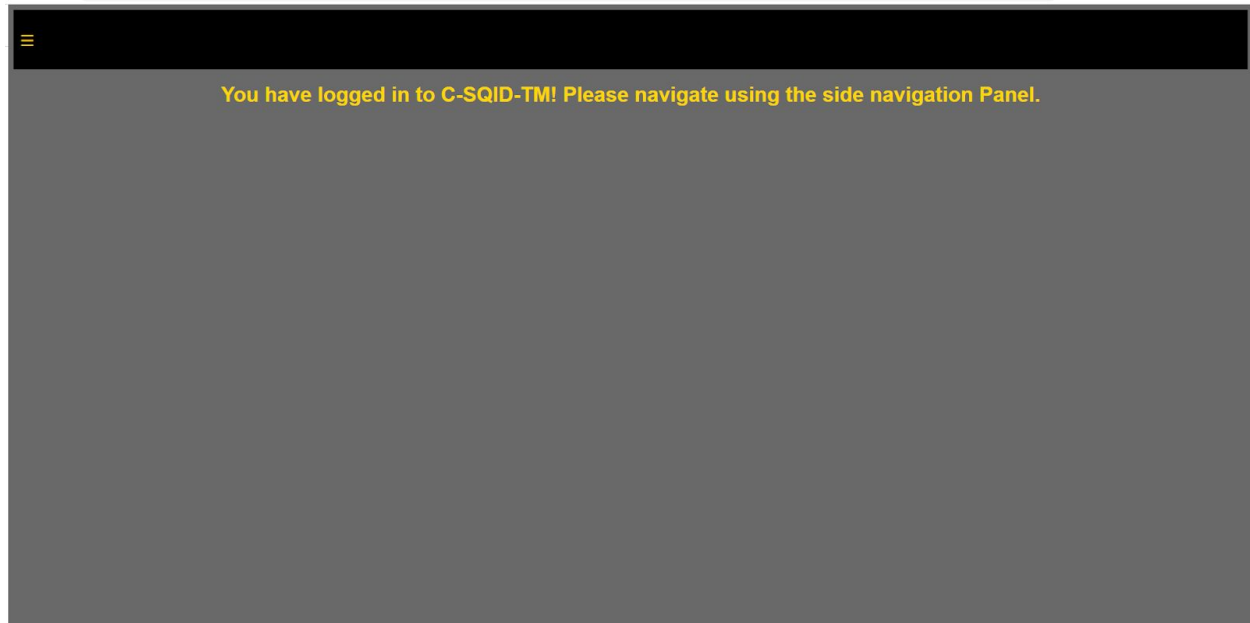
### 4.1.1 Summary of Test Results

The security test involves two tests as specified in the projects's Software Test Plan; 4.2.1.1 and 4.2.1.2 for this project. 4.2.1.1 plans to check if the token from the user account is verified correctly with the database and 4.2.1.2 plans to check with wrong and correct credentials to see the login process.

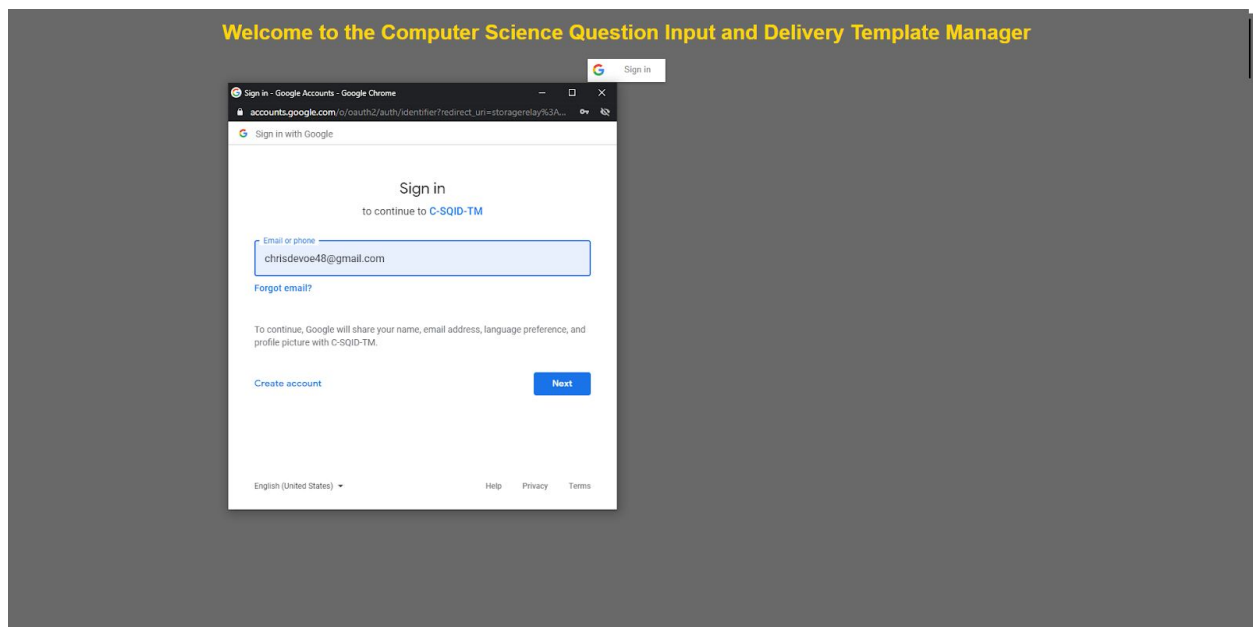
The image shown below shows an authenticated email address which is located in the database for authenticated users. This will check to make sure that this email address can successfully login to the web application and that it would be correctly verified with the database as it would give an error message if the email can't be verified with the database.



The image below shows a successful login with the email address used above.



Next the image below will show a user who does not have a verified login credential. This is so that these users can not access the database or web application and that the web application is properly verifying email addresses with the database. This should be shown with an error message.



The image below shows that when a user with bad credentials tries to login the user will not be allowed access to the web application and the database as this error will show.



---

**Access Denied - Please contact your server administrator.**

[Go Back](#)

The security test was deemed successful; the web application successfully verified the token from the user account with the table from the database storing authorized users. This was shown by trying to login with a user who was authorized and was in the database compared to a user who did not have their credentials stored in the database. The user who was stored in the database was able to successfully login to the web application and could use the database while the user who was not authenticated was given the correct error message.

#### **4.1.2 Problems Encountered**

The security test revealed no problems as a user with the wrong credentials could not login to the application and the user with correct credentials could.

#### **4.1.3 Deviations from Test Cases/Procedures**

The test procedure identified in the test plan was followed in full without any deviation.

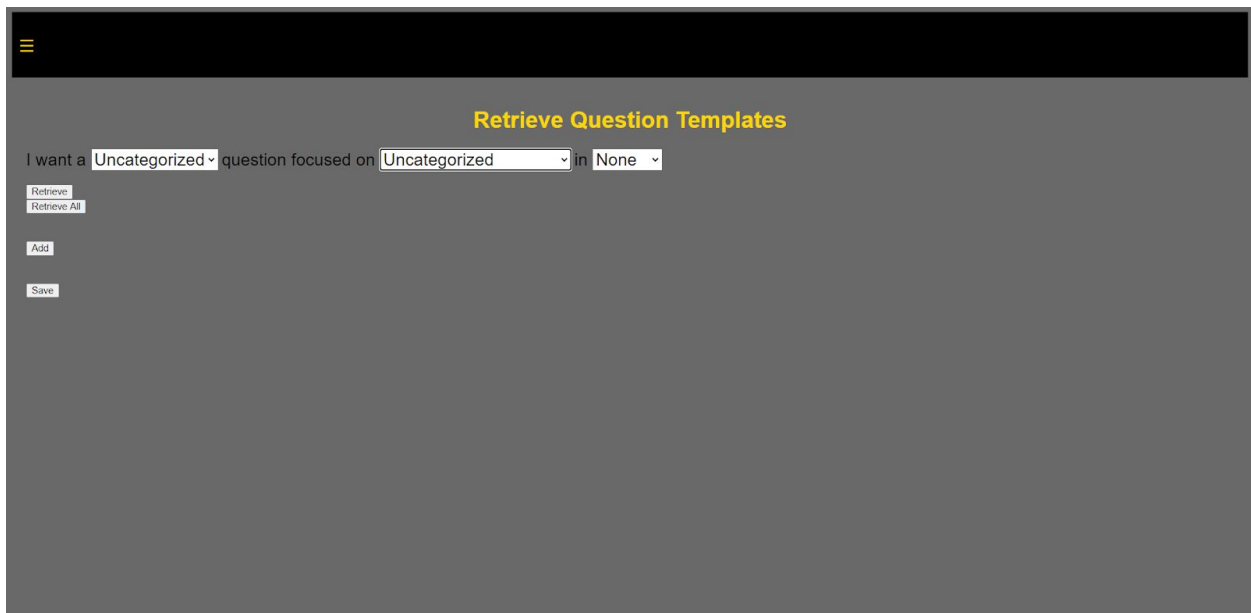
### **4.2 Retrieval Test**

The application retrieval test checks to ensure that the retrieving function of the application where users can retrieve template files from the database works fluidly and properly.

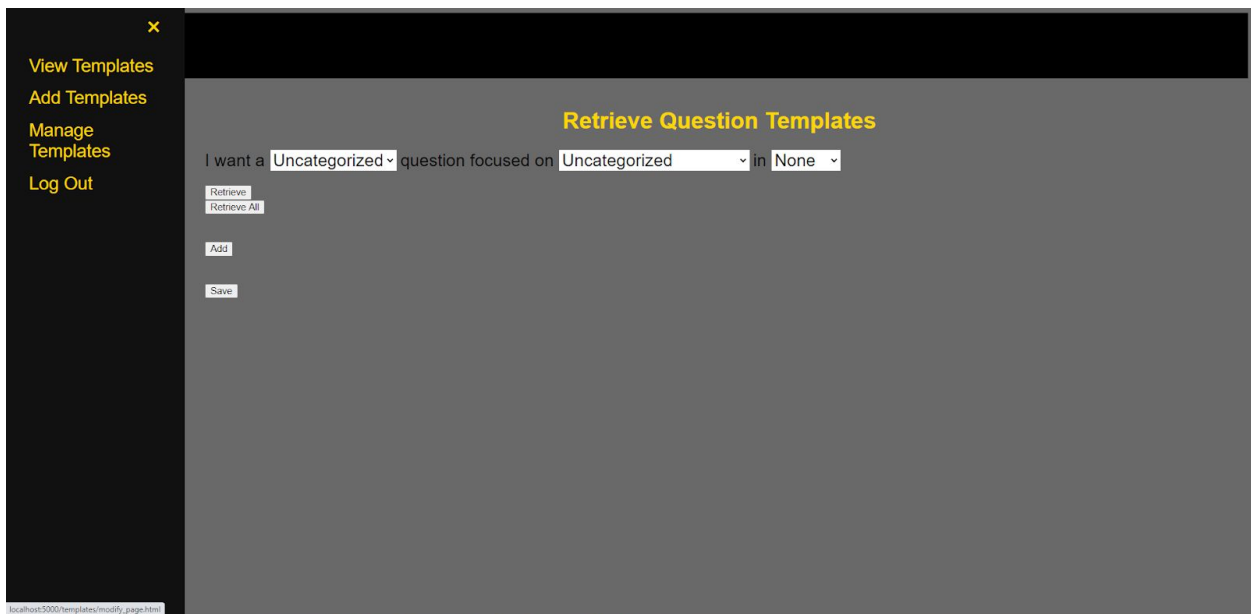
#### **4.2.1 Summary of Test Results**

The security test involves two tests as specified in the projects's Software Test Plan; 4.2.4.1, 4.2.4.2, and 4.2.4.3 for this project. 4.2.4.1 plans to check if the user interface works fluidly, renders the correct page, and exhibits no problems accessing the side navigation bar and button/drop-down list box features. 4.2.4.2 plans to check if the correct template file is retrieved by the database. The connection to the template file database, and retrieve functionality will also be analyzed to ensure proper template file retrieval. Finally, 4.2.4.3 plans to check that retrieved question templates can be filled out correctly and exported to a user's local device. The responsiveness of the webpage elements such as the select buttons and drop-down list box features will be extensively tested for fluid operability.

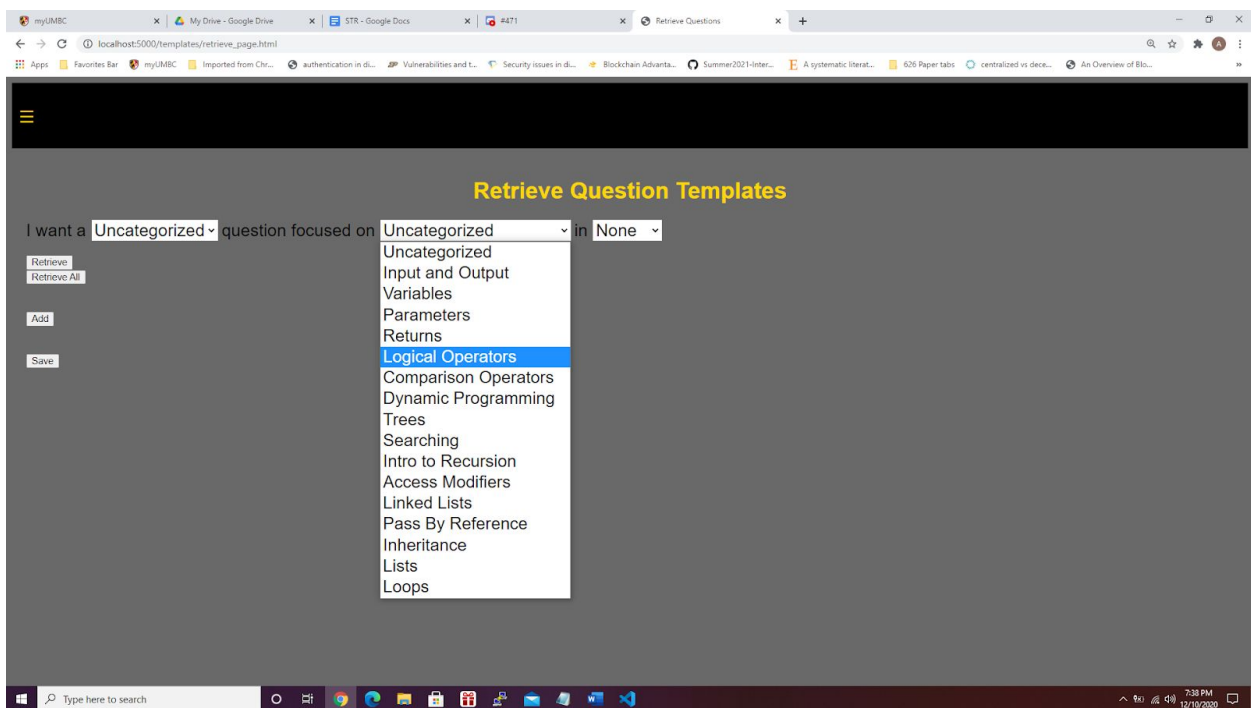
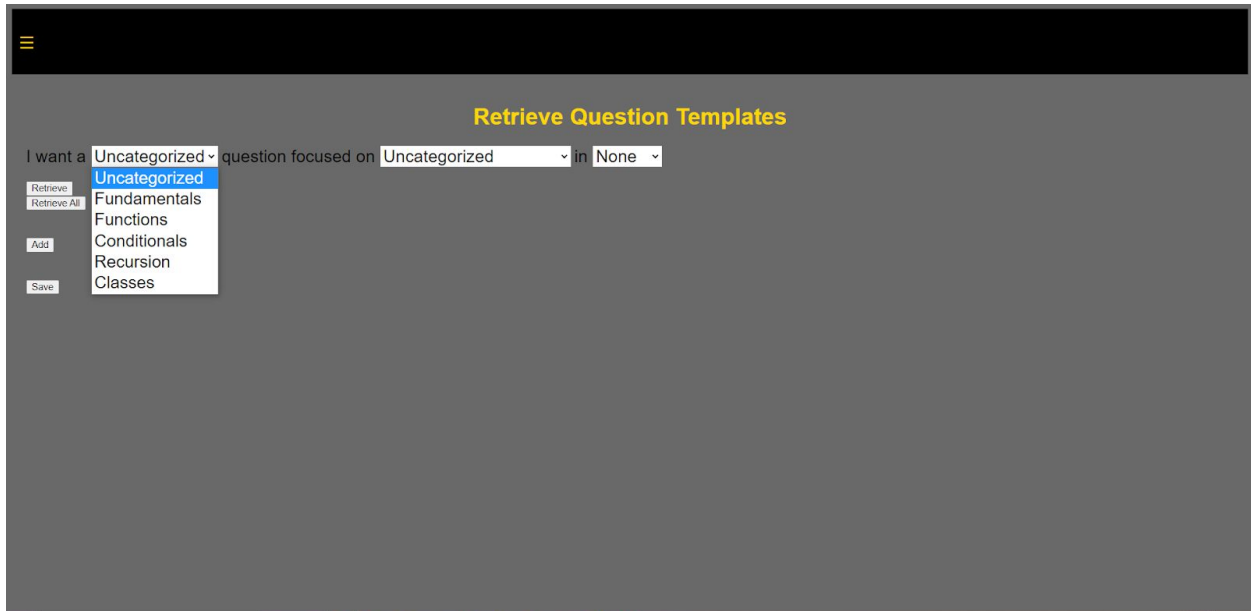
The image shown below shows the retrieval page which can be used to retrieve questions. As shown below, the correct webpage is returned and all elements of the webpage seem to be displayed in the correct formatting.

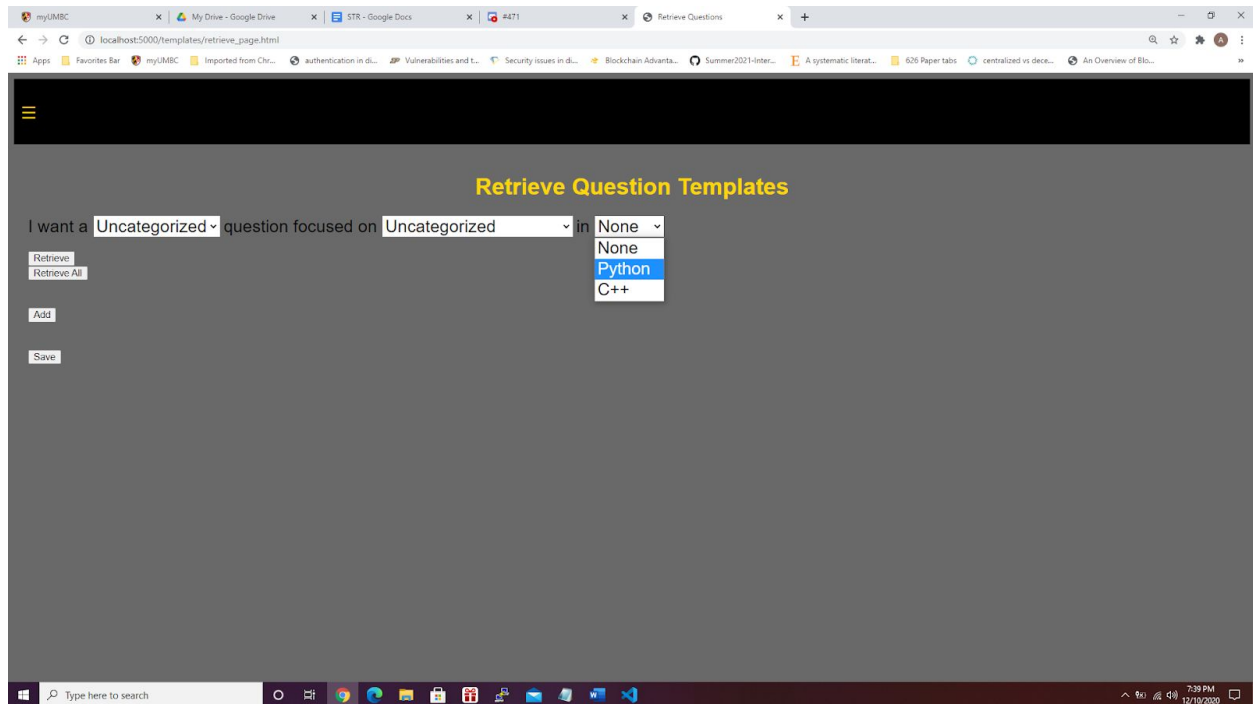


The image below shows the sidenav bar being accessed. The animation of the sidenav bar is displayed properly and the sidenav bar elements are hyperlinked to redirect to their appropriate web pages.



Next, the images below shows the drop-down list box elements being used to select a question for retrieval





As shown in the screenshots, the drop-down list box menu elements functioned properly and fluidly, effectively passing test 4.2.4.1

The image below shows questions being retrieved from the database in response to a retrieval query:

Select	ID	Template	Average Grade	Expected Difficulty	Course
<input type="checkbox"/>	407	What is the definition of [ ]?	90.0	E	201
<input type="checkbox"/>	408	Write code to check if [ ] is the same as [ ]	95.0	E	201
<input type="checkbox"/>	409	In an array [ ] to [ ] where [ ] is stored write code that will find (var_3)	75.0	H	201
<input type="checkbox"/>	410	Write code to find which [ ] is [ ] between [ ] and [ ]	82.0	M	201
<input type="checkbox"/>	411	Write a for loop of ints from [ ] to [ ]	88.0	M	201
<input type="checkbox"/>	412	Write a [ ] to loop through an array of [ ] named A1	90.0	E	201
<input type="checkbox"/>	413	Return the [ ] of [ ] and [ ]	92.0	E	201
<input type="checkbox"/>	414	Write a function that will return a [ ] to the user	95.0	E	201
<input type="checkbox"/>	415	In an array A = ([ ], [ ], [ ], [ ]). What would A[ ] equal?	80.0	M	201
<input type="checkbox"/>	416	[ ] is [ ] true?	90.0	E	201

As shown in the above screenshot, test 4.2.4.2 is also satisfied.

The final test involves filling out retrieved templates and exporting retrieved questions to the user's local device as a text file. The image below shows an example of a retrieved template question being filled out with specific entry values in the blanks:

**Retrieve Question Templates**

I want a **Uncategorized** question focused on **Uncategorized** in **None**

Retrieve  
Retrieve All

Select	ID	Template	Average Grade	Expected Difficulty	Course
<input checked="" type="checkbox"/>	407	What is the definition of <input type="text" value="variable"/> ?	90.0	E	201
<input type="checkbox"/>	408	Write code to check if <input type="text" value="-4"/> is the same as <input type="text" value="-2"/>	95.0	E	201
<input type="checkbox"/>	409	In an array <input type="text" value=""/> to <input type="text" value=""/> where <input type="text" value=""/> is stored write code that will find (var_3)	75.0	H	201
<input type="checkbox"/>	410	Write code to find which <input type="text" value=""/> is <input type="text" value=""/> between <input type="text" value=""/> and <input type="text" value=""/>	82.0	M	201
<input type="checkbox"/>	411	Write a for loop of ints from <input type="text" value=""/> to <input type="text" value=""/>	88.0	M	201
<input type="checkbox"/>	412	Write a <input type="text" value=""/> to loop through an array of <input type="text" value=""/> named A1	90.0	E	201
<input type="checkbox"/>	413	Return the <input type="text" value=""/> of <input type="text" value=""/> and <input type="text" value=""/>	92.0	E	201
<input type="checkbox"/>	414	Write a function that will return a <input type="text" value=""/> to the user	95.0	E	201
<input type="checkbox"/>	415	In an array A = ( <input type="text" value=""/> , <input type="text" value=""/> , <input type="text" value=""/> , <input type="text" value=""/> ). What would A[ <input type="text" value=""/> ] equal?	80.0	M	201
<input type="checkbox"/>	416	Is <input type="text" value=""/> true?	90.0	E	201

The image below shows the questions being added for file export. The question added is displayed below the add button on the page:

**Retrieve Question Templates**

I want a **Uncategorized** question focused on **Uncategorized** in **None**

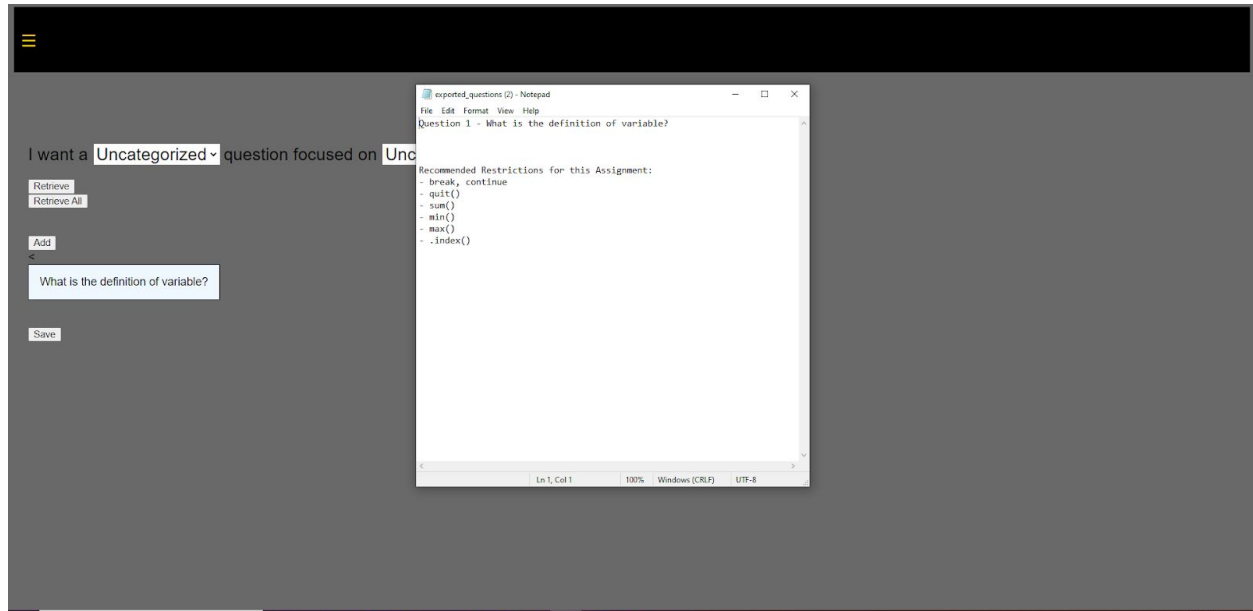
Retrieve  
Retrieve All

Add

What is the definition of variable?

Save

Finally, we export to the text file by clicking the “Save” button. The image below shows the result:



The question and relevant restriction information about the question has been exported to a text file, satisfying test 4.2.4.3 successfully.

## 4.2.2 Problems Encountered

No problems were encountered during the retrieval testing of the software. All three sub tests under retrieval testing were successful with the frontend UI, template questions retrieval, and the template update and export features all working properly.

## 4.2.3 Deviations from Test Cases/Procedures

The test procedures for retrieval testing specified in the software test plan were duly followed in full without any deviation.

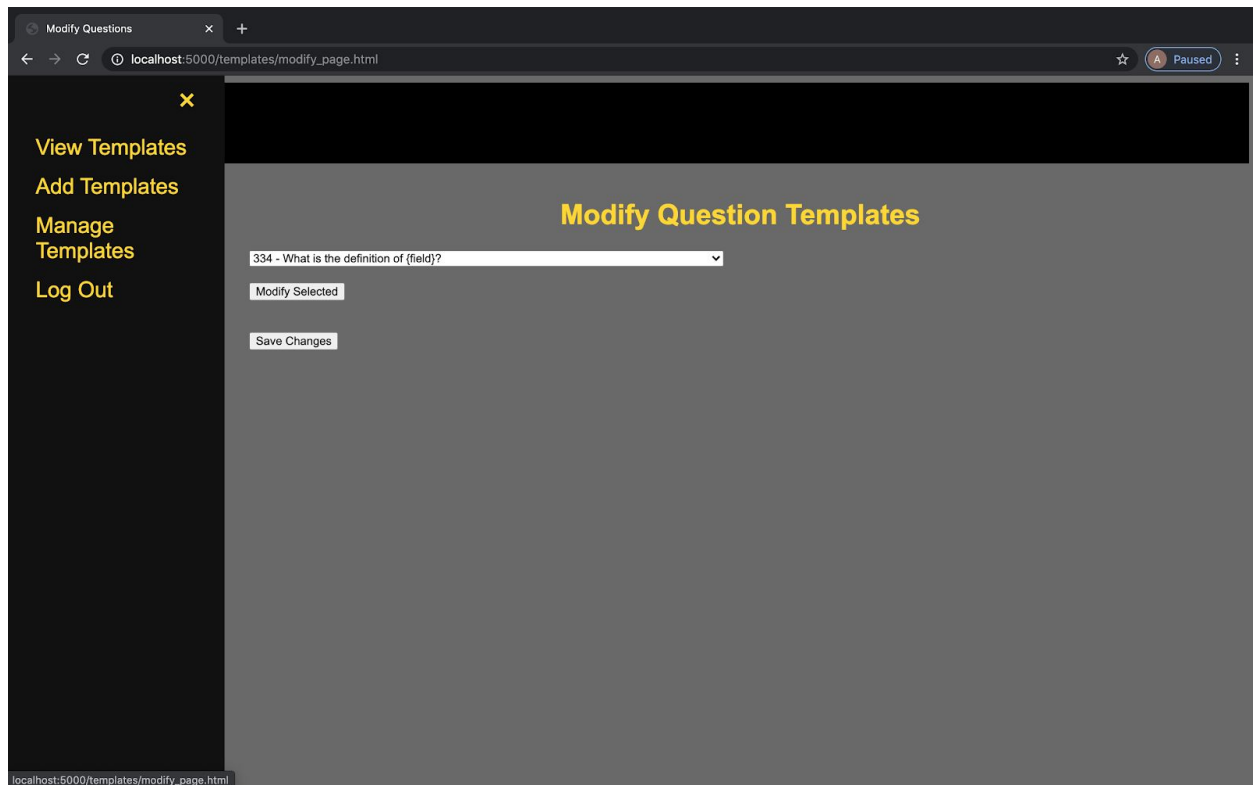
## 4.3 Modify Test

The modify test ensures that users are able to successfully modify questions that have already been stored inside the database.

### 4.3.1 Summary of Test Results

The results of this test should check that all buttons are working properly and that the modified questions are uploaded into the database accurately and efficiently; as mentioned in the STP in section 4.2.5.

After choosing “Manage Templates”, the image below shows the home page for modifying the templates/questions. From here, you can choose a question to be modified from the dropdown menu then click the “modify selected” button.



Next, is the screen where you actually modify the question and it's templated form. This specific test question for this demonstration was #340, which asked to “return the {field} of {num} and {num}, for which sum, 8 and 9 were filled in. The category and subcategory were also filled in for test purposes.

The question selected from the drop down menu on the “Modify Question Templates” changes back to a default question (the first question in the drop down menu) when the user selects the “modify selected” button. However, the question is correct underneath the template column.

334 - What is the definition of {field}?

Modify Selected

ID	Category	Subcategory	Template	Average Grade	Expected Difficulty	Course	Language	Restrictions
340	Fundamentals	Returns	Return the sum of 8 and	0.0	-	0	Python	min() max() .index() break, continue

Save Changes

Once “save changes” is selected, the template is automatically updated into the database. While the update may not be seen immediately in the drop down menu, it has been confirmed that the database has in fact updated the question template. This issue has been mentioned in the next section.

### 4.3.2 Problems Encountered

The only “problem” encountered in this testing is that the question that was manipulated does not update until the page is updated. This can be done by reselecting the “modify templates” button from the apps menu.

### 4.3.3 Deviations from Test Cases/Procedures

There were not any deviations from the test cases and procedures, as both tests stated in the STP checked out.

## 4.4 Uploading Test

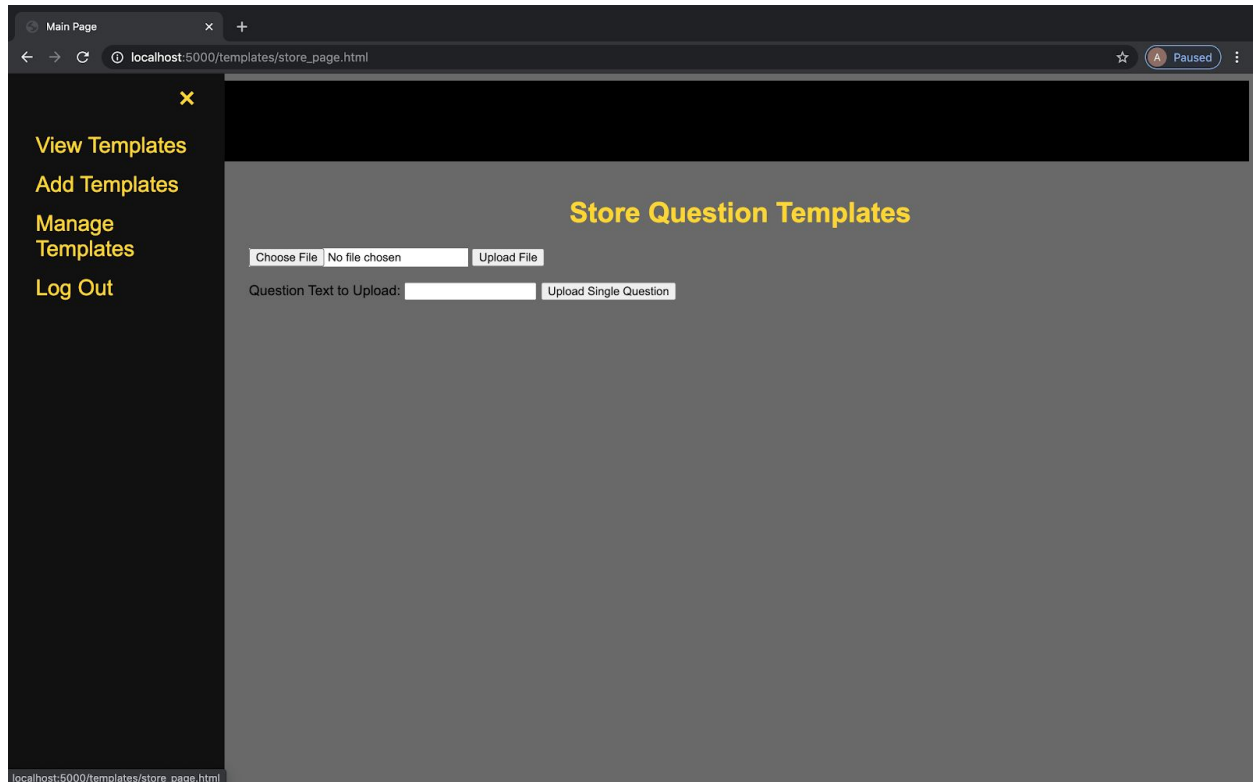
The uploading test makes sure that the user is able to successfully upload new content, either as a single question or an entire document.



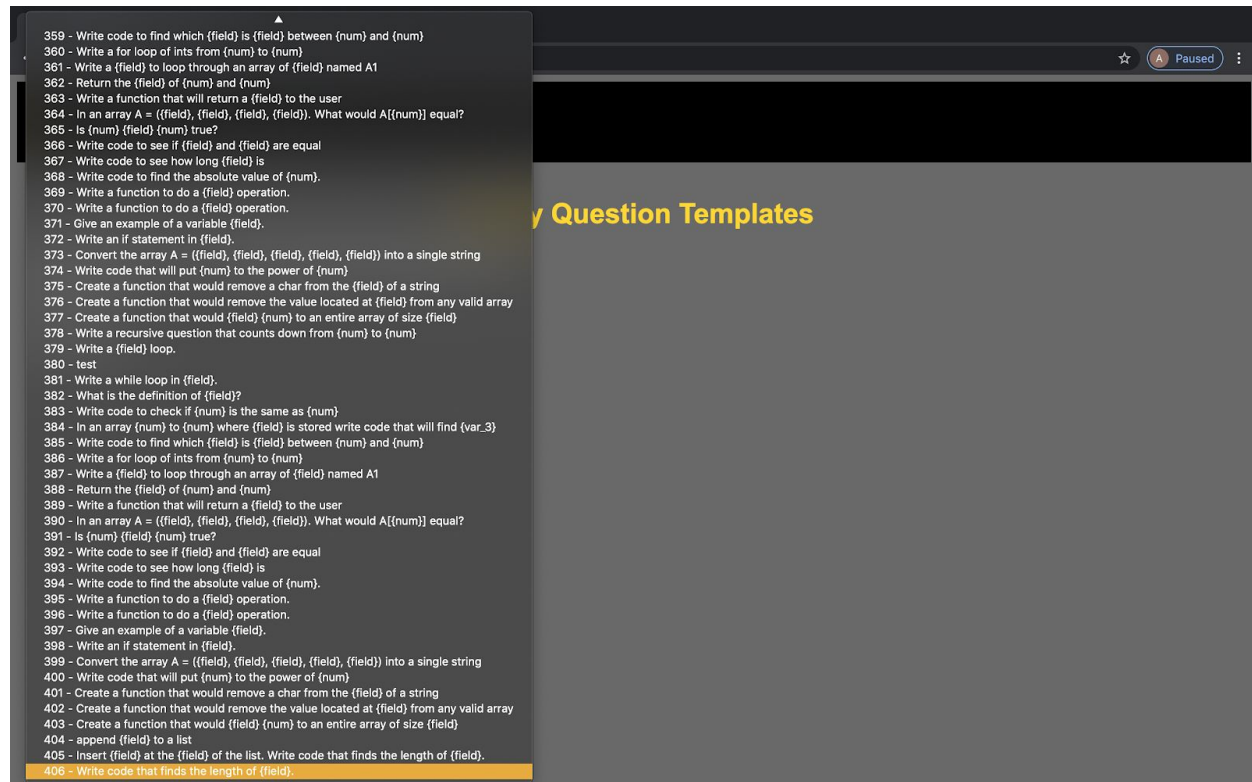
#### 4.4.1 Summary of Test Results

The results of this test should ensure that the user is able to click the necessary button to be able to upload the question templates into the database using multiple methods; as described in the STP in 4.2.3.

As shown in the image below, the user was able to click on the “Add Templates” button from the side menu to be directed to the “Store Question Templates” screen. From there the user is given two different options for uploading their question templates; either an entire document of questions or a single question.



Once the user clicks either the “Upload File” or the “Upload Single Question” button, a success message pops up to confirm to the user that their templates have been successfully uploaded. Next, the user can toggle to the “Manage Templates” button in the side menu, click the drop down menu that hosts all the questions in the database and scroll down to the bottom to see their questions; as shown in the next image.



Numbers 405 and 406 were the test questions uploaded. Number 405 was from a .txt document created by Microsoft Word and number 406 was a single question upload.

#### 4.4.2 Problems Encountered

I created a .txt document that hosted 2 questions on separate lines, when uploading the document it made both questions as one question in the database.

#### 4.4.3 Deviations from Test Cases/Procedures

There were no deviations from the test cases or procedures, as both tests stated in the STP checked out.

### 4.5 Connectivity Test

The connection test will check the database to ensure the question templates are stored properly and that the user cannot access the database if the link is broken.

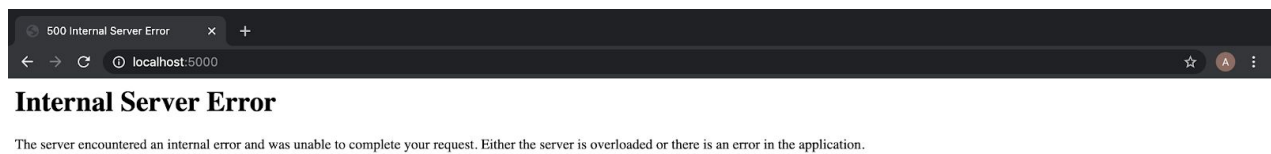
#### 4.5.1 Summary of Test Results

The results of this test should check the link between the template files stored inside of the database and the applications. The database will also be inspected for correctness of formatting

and the storing of the question template data. These tests were stated in the STP in section 4.2.2.

It is shown in previous tests that the database updates the question templates accordingly. Specifically in the modify test, you can see that the link between the data and the application is responsive after seeing the updated list of questions from the drop down menu. This also shows that the database stores the question templates as suspected.

The below image is the result of an incorrect database link. The server would not allow access to the application past the point of signing in. This is what is wanted because if the database is not working properly, then the application cannot operate in terms of adding and retrieving the database.



#### 4.5.2 Problems Encountered

There were no problems that occurred during this test.

#### 4.5.3 Deviations from Test Cases/Procedures

There were no deviations from the test cases and procedures that were stated in the STP in section 4.2.2.

## 5. Test Log

### 1. Security Test Event

- a. Date Time: December 3rd, 2020
- b. Hardware and Software used:
  - i. The current version of C-SQID-TM
  - ii. The current version of Windows OS
  - iii. The current version of Google Chrome and Microsoft Edge
- c. This test was performed on December 3rd, 2020 by Chris DeVoe

### 2. Retrieval Test Event

- a. Date Time: December 6, 2020
- b. Hardware and Software used:
  - i. The current version of C-SQID-TM
  - ii. The current version of Windows OS
  - iii. The current version of Google Chrome and Microsoft Edge
- c. This test was performed on December 6th, 2020 by Amrithya Balasubramanian

### 3. Modify Test Event

- a. Date Time: December 7, 2020
- b. Hardware and Software used:
  - i. The current version of C-SQID-TM
  - ii. The current version of Mac OS
  - iii. The current version of Google Chrome
- c. This test was performed by Aleya Mayo

### 4. Uploading Test Event

- a. Date Time: December 7, 2020
- b. Hardware and Software used:
  - i. The current version of C-SQID-TM
  - ii. The current version of Mac OS
  - iii. The current version of Google Chrome
  - iv. The current version of Microsoft Word
- c. This test was performed by Aleya Mayo

### 5. Connectivity Test Event

- a. Date Time: December 8, 2020
- b. Hardware and Software used:
  - i. The current version of C-SQID-TM
  - ii. The current version of Mac OS
  - iii. The current version of Google Chrome
- c. This test was performed by Aleya Mayo