On the Exam Line

Sprint 2 - Regression Testing and Incremental Testing

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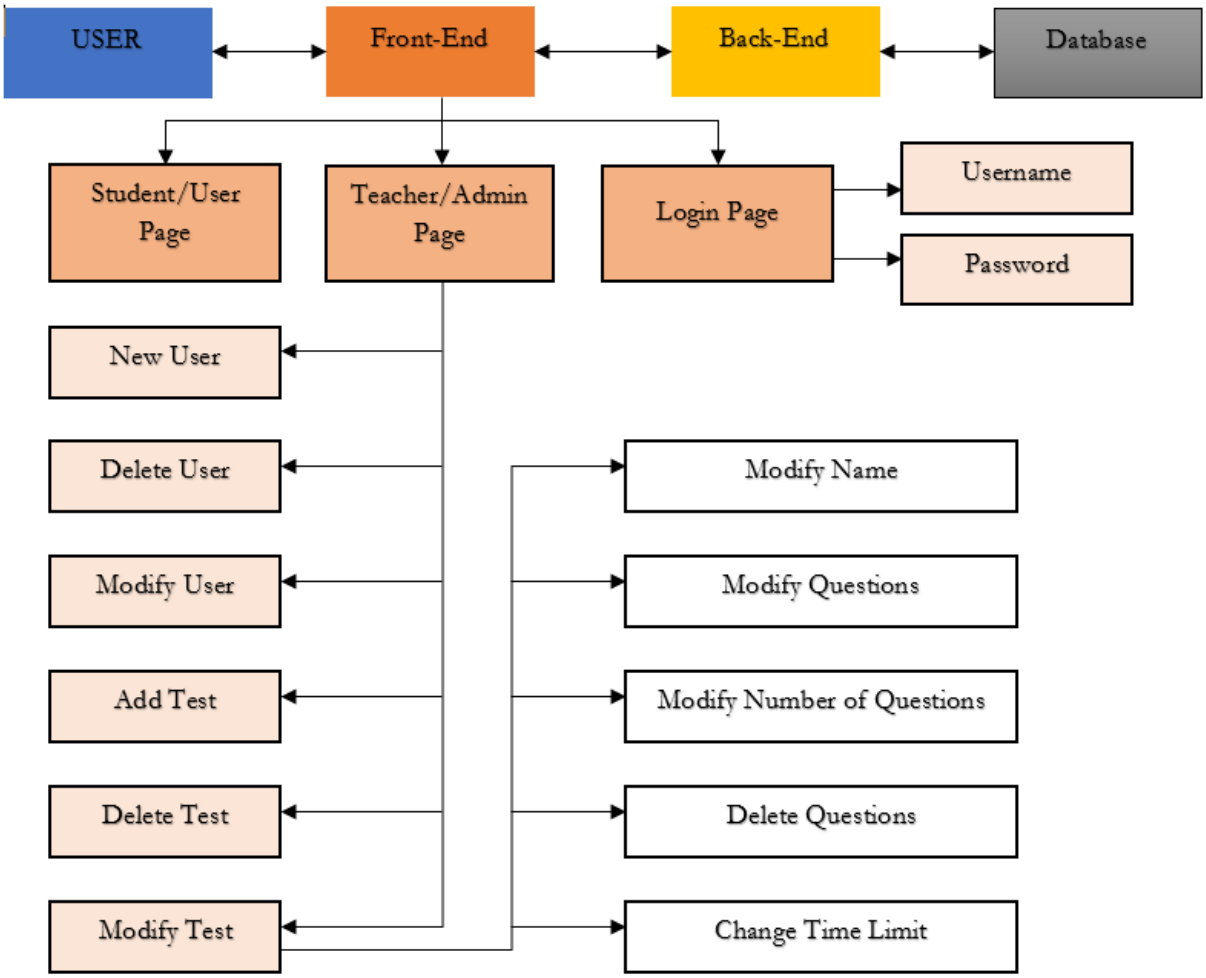
1. Classification of Components

1.1 Defining all Components



1. **User:** The person who will be using our application.

2. **Front-End:** Our front end is a simple web application that is written in HTML, PHP, JavaScript, and CSS. It is dependent on the backend server which is simulated by using XAMPP. It takes text, radio buttons, and pushbuttons as inputs from the user, and makes the appropriate calls to the database for data retrieval. After processing the information, it's output

is updated on the same page, or the user is redirected to the appropriate page. As it is the front end, no other component depends on it. Front end itself is broken down into several components which have their own dependencies.

a. Login Page:
    i. Username
    ii. Password
b. Teacher/Administrator Page:
    i. New User
    ii. Modify User
    iii. Delete User
    iv. Add Test
    v. Delete Test
    vi. Modify Test:
        1. Modify Name
        2. Modify Questions
        3. Modify Number of Questions
        4. Delete Questions
        5. Change Time Limit
c. Student Page

3. **Back End:** Our backend is responsible for the apache interpreter. As it is provided by XAMPP we didn't want to change it very much. We used it to implement features of PHP which could be interpreted only by an apache interpreter. It is mainly used to send values of variables from one page to the other. It plays a vital role in the application as the front end heavily depends on it.

4. **Database:** The PHP files communicate to the database through the XAMPP server. This connection is established through XAMPP's secure network using specific statements. The MySQL database effectively stores all the data in the tables.

1.2 Form of Incremental Testing Used

We used the **bottom-up** incremental testing strategy to test On-The-Exam-Line. Using drivers, we began testing the lower-level modules, eventually working our way up to the main high-level modules. We created test cases for each individual lower-level component and then tested the components that relied on those on the lower level, moving up the hierarchy. For a short example, we tested the components for modify name, modify questions, modify number of questions, delete questions, and change time limit. When those were working, we then moved up a level and tested the modify test component. It was easier for us to write test cases for individual modules that were already existing, so bottom-up testing was the best strategy for us.

2. Incremental and Regression Testing

A) MODULE | COMPONENT A - FRONT END

→ **Incremental Testing**

Defect No.	Description	Severity	How to Correct
1	To make the application look more presentable, we included a few style tags in the pages and this made the application a little harder to navigate through. The various options were misaligned. There we no spaces or new-lines between sentences which made it harder to read various things.	3	As we were running out of time, we decided to tone down the style and keep it simple instead of trying to make it very fancy. After removing most of the intricacies, the looks reverted back to acceptable standards.

→ **Regression Testing**

Defect No.	Description	Severity	How to Correct
1	The login page was still a little misshapen even after the change.	3	We created a separate script for the login page as the format for this page was different as compared to the other pages which were very similar.

B) MODULE |COMPONENT C - DATABASE

→ **Incremental Testing**

Defect No.	Description	Severity	How to Correct
1	The answers to the essay questions and the correct choice for the multiple-choice question were stored in the same column. This allowed the teacher to enter an answer for the multiple-choice question which had more than one character thus making all the options wrong.	1	We made separate columns for multiple-choice answers and essay answers. We also included a flag to indicate multiple choice questions and essay questions so that we could accordingly mark the appropriate columns NULL.

→ **Regression Testing**

Defect No.	Description	Severity	How to Correct
1	The adjustments made to use the flag value while modifying the questions	1	Instead of modifying the entire table at once, we split

	were not working as intended. When questions were added, the MCQ flag value had to be changed and the changes made were incorrect for some cases.		it up into 2 tasks. We first modified the MCQs and then attempted to modify the essay questions. This helped in keeping track of the flag value.

3. Updated Product Backlog

Functional Requirements: Administrator

Backlog Id	Functional Requirement	Hours	Status	UPDATED STATUS
1.	Log in to the administrator account.	2	Sprint 1	Completed in Sprint 1
2.	Add new users.	4	Sprint 1	Completed in Sprint 1
3.	Modify existing users.	3	Sprint 1	Completed in Sprint 1
4.	Delete existing users.	2	Sprint 1	Completed in Sprint 1
5.	Add new exam: Choose the number of multiple choice questions.	3	Sprint 1	Completed in Sprint 1
6.	Add new exam: Choose the number of free response questions (Essay questions).	3	Sprint 1	Completed in Sprint 1
7.	Add new exam: Set a custom time limit for each exam.	3	Sprint 1	Completed in Sprint 1
8.	Add new exam: Enter multiple exams for each chapter.	3	Sprint 1	Completed in Sprint 1
9.	Clone an exam: Copy all the questions into a new exam with a different name.	3	Sprint 2	Completed in Sprint 2
10.	Modify existing exam: Edit the name of the exam.	3	Sprint 1	Completed in Sprint 1
11.	Modify existing exam: Edit existing questions.	3	Sprint 1	Completed in Sprint 1
12.	Modify existing exam: Add new questions.	3	Sprint 1	Completed in Sprint 1
13.	Modify existing exam: Delete existing questions.	3	Sprint 1	Completed in Sprint 1
14.	Modify existing exam: Change time limit.	3	Sprint 1	Completed in Sprint 1
15.	Change the name of an existing chapter.	3	Sprint 2	Completed in Sprint 2

16.	Delete an existing exam.	2	Sprint 1	Completed in Sprint 1
17.	Grade free response questions (essay questions) entered by users.	3	Sprint 2	Completed in Sprint 2
18.	Decide which chapter's exam the user should be able to take.	3	Sprint 1	Completed in Sprint 1
19.	Review the test scores of all the test takers.	3	Sprint 2	Completed in Sprint 2
20.	Review the answers of the users against the correct answers of that exam.	3	Sprint 2	Completed in Sprint 2
21.	Log out of the account.	2	Sprint 1	Completed in Sprint 1

Functional Requirements: User

Backlog Id	Functional Requirement	Hours	Status	UPDATED STATUS
1.	Log in to their user account.	2	Sprint 1	Completed in Sprint 1
2.	Take a test.	3	Sprint 2	Completed in Sprint 2
3.	Be assigned an exam randomly from the selected chapter to users (if chapter has multiple variations).	4	Sprint 2	Completed in Sprint 2
4.	See time remaining during a test.	3	Sprint 2	Completed in Sprint 2
5.	See multiple choice grade as soon as test is over.	3	Sprint 2	Completed in Sprint 2
6.	See overall grade after free response questions (essay questions) are graded.	3	Sprint 2	Completed in Sprint 2
7.	Log out of their user account.	2	Sprint 1	Completed in Sprint 1

Functional Requirements: Database

Backlog Id	Functional Requirement	Hours	Status	UPDATED STATUS
1.	User information.	4	Sprint 1	Completed in Sprint 1
2.	List of chapters.	4	Sprint 1	Completed in Sprint 1
3.	Test information.	4	Sprint 1	Completed in Sprint 1
4.	Test questions.	3	Sprint 1	Completed in Sprint 1

5.	Answers to multiple choice questions.	3	Sprint 1	Completed in Sprint 1
6.	Answers entered by the user.	3	Sprint 2	Planned for Sprint 2
7.	User's grades.	4	Sprint 1	Completed in Sprint 1
8.	Chapters the users are allowed to take a test for.	4	Sprint 1	Completed in Sprint 1

Non -Functional Requirements

Backlog Id	Functional Requirement	Hours	Status	UPDATED STATUS
1.	The application should be supported by all web browsers.	4	Sprint 1	Completed in Sprint 1
2.	The application should be attractive and easy to use.	4	Sprint 1	Completed in Sprint 1
3.	As a developer, I would like to store information in a MySQL database.	4	Sprint 1	Completed in Sprint 1
4.	Database should handle requests.	4	Sprint 1	Completed in Sprint 1
5.	Separate administrator privileges.	3	Sprint 1	Completed in Sprint 1