**Chapter-5**

**SOFTWARE TESTING**

Software development is a process of conceiving the specification specified in the designing stage into source. Testing is the process of exercising software with the intent of finding errors and ultimately correcting them. The following testing techniques have been used to make this project free from errors.

**5.1 WHITE BOX TESTING**

The first type of testing that was done is the white box testing. White box testing tested different components by giving it a certain input and checking if that component generates the correct output. Even though there was a lot of testing done in this stage, the most important tests are listed down below:

* Check if data is being transferred correctly between client and the server.
* Check if submission is being compiled correctly.
* Check if the server returned the error in the code. Like syntax error, semantics error, run time error etc.
* Make sure submissions are reached or throw an error to notify contestant to try to submit again.
* Prevent the student attempting any of the published test other than allotted to him.
* Make sure that at the end of the test the teacher is able to view the submitted code successfully.

**5.2 BLACK BOX TESTING**

After testing the internal components with the white box testing, the system components as a whole were tested with black box testing. The technique used was choosing different configurations and different test cases and test and make sure it passed the test. So every test case will be tested multiple times and on different configurations. For each test mentioned in the table below, the software was configured in different configuration as listed:

* 1 Student on the one PC, and another Student on another PC. (2 PCs total)
* Multiple Student and each of them on different Pc’s.

Now for every of the previous configurations listed above, the following test cases were performed and made sure that it passed on every configuration. The following are the list some of the most important black box test cases used for the project:

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| **Test Case** | **Expected Output** |
| The teacher should be able to login and create a test. | Test should be published with multiple questions in it. |
| Student should be able to login, submit, and logout. | The submission should be added to the server . |
| Student should not be able to attend test if he is not allotted that test. | The student should be redirected to its default login page if trying to attempt a test which is not allotted to him. |
| Server should continue to accept submissions after recovery from a crash. | When again compiled the pre written code the server successfully execute the code. |
| Server should be able to accept multiple submissions at the same time from many contestants. | It should receive all of them and validate them without any issues. |