Edu-Triviam

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Methodology

Black-Box Test Cases

Black-box test cases are designed based on the available documentation and execution of the program. The internal code is not inspected during this process. Below is a list of the black-box test cases, including their brief description, preconditions, test steps, expectations, and observations.

1. **Category Test**
   - **Preconditions:** None
   - **Test Steps:** Create a temporary set of classes to mock the functionality of the software. Provide an input within the test to select the category and then check the variable topic from the Controller class to verify that the methods worked as expected.
   - **Expectation:** The variable should match the category name.
   - **Observation:** Pass
2. **Difficulty Test**
   - **Preconditions:** Category needs to be selected.
   - **Test Steps:** Extend the Category test. Provide an input within the test to select the difficulty and then check the variable difficulty from the Controller class to verify that the methods worked as expected.
   - **Expectation:** The variable should match the difficulty level.
   - **Observation:** Pass
3. **50-50 Lifeline**
   - **Preconditions:** Difficulty needs to be selected.
   - **Test Steps:** Provide a built-in question. Use a condition to verify the number of options nullified after using the lifeline.
   - **Expectation:** The number of options should be halved.
   - **Observation:** Pass
4. **Remove One Wrong Option Lifeline**
   - **Preconditions:** Difficulty needs to be selected.
   - **Test Steps:** Provide a built-in question. Use a condition to verify the number of options nullified after using the lifeline.
   - **Expectation:** One option should be nullified.
   - **Observation:** Pass
5. **Hint Lifeline**
   - **Preconditions:** Difficulty needs to be selected.
   - **Test Steps:** Provide a built-in question with a hint. Use a condition to verify the hint is returned after using the lifeline.
   - **Expectation:** Successful matching of hint variable and hint returned.
   - **Observation:** Pass
6. **Question Database**
   - **Preconditions:** Difficulty needs to be selected.
   - **Test Steps:** Call the database and verify the number of questions loaded along with the details of the first question.
   - **Expectation:** The number of questions loaded and details of the first question must match.
   - **Observation:** Pass

White-Box Test Cases

White-box test cases are derived from a thorough inspection of the code. This approach allows for the identification of specific paths and conditions to be tested, ensuring comprehensive coverage of the software's functionality.

1. **Invalid Input for Topic Selection**
   - **Preconditions:** None
   - **Test Steps:** Use an invalid input.
   - **Expectation:** The method should default to General Knowledge.
   - **Observation:** Fail
2. **Invalid Input for Difficulty Selection**
   - **Preconditions:** Category needs to be selected.
   - **Test Steps:** Use an invalid input.
   - **Expectation:** The method should default to Easy.
   - **Observation:** Fail
3. **Using a Lifeline Twice**
   - **Preconditions:** Difficulty needs to be selected.
   - **Test Steps:** Load a set of questions and use a lifeline on a question. Verify that if the lifeline is used again, an exception is thrown.
   - **Expectation:** The method should throw an exception.
   - **Observation:** Fail
4. **Null Question**
   - **Preconditions:** Difficulty needs to be selected.
   - **Test Steps:** Pass a null question to the askQuestion method.
   - **Expectation:** The method should throw an exception.
   - **Observation:** Pass
5. **Null Options**
   - **Preconditions:** Difficulty needs to be selected.
   - **Test Steps:** Pass a question with null options to the askQuestion method.
   - **Expectation:** The method should throw an exception.
   - **Observation:** Fail

Results

The observations from each test case are documented below. The results indicate whether the test cases passed successfully or if there were any failures, along with a brief description of the failure.

Black-Box Testing Results

- **Category Test:** Pass
- **Difficulty Test:** Pass
- **50-50 Lifeline:** Pass
- **Remove One Wrong Option Lifeline:** Pass
- **Hint Lifeline:** Pass
- **Question Database:** Pass

White-Box Testing Results

- **Invalid Input for Topic Selection:** Fail
- **Invalid Input for Difficulty Selection:** Fail
- **Using a Lifeline Twice:** Fail
- **Null Question:** Pass
- **Null Options:** Fail