**Unit testing:**

In this test, we will be testing individual units of the system separately to ensure that each unit performs as designed. This system has been divided into three modules, so in unit testing each module will be tested individually.

**Main menu (Module 1) testing**:

In this test, we will perform scenario based test case design for Start Tour Guide Use-Case:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Test Scenario | Test Case Description | Precondition | Test Steps | Test Data | Expected Results | Actual Result |
| TC\_001 | Starting the tour guide for the water cycle | Testing start tour guide functionality by looking at the button for 2 seconds | Launch the app. | Look at the Tour Guide button for 2 seconds. | - | Tour guide Started | Tour Guide started |
| TC\_002 | Starting the tour guide for the water cycle | Testing start tour guide functionality by not looking at the tour guide button | Launch the app | Look anywhere but not on the Tour Guide button | - | Tour Guide does not start. i.e. no action taken | Tour guide does not start |
| TC\_003 | Starting the tour guide for the water cycle | Testing Start tour guide functionality by looking at start Game button | Launch the app. | Looks at the start game button for 2 seconds. | - | Game starts | Game starts and tour guide does not start |

In this test, we will perform scenario based test case design for Start Game Use-Case:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Test Scenario | Test Case Description | Precondition | Test Steps | Test Data | Expected Result | Actual Result |
| TC\_001 | Starting the Game. | Testing start Game functionality by looking at the start Game button for 2 seconds. | Launch the app. | Look at the Start Game button for 2 seconds. | - | Game is started | Game is started |
| TC\_002 | Starting the Game. | Testing start Game functionality by not looking at the Start Game button | Launch the app | Look anywhere but not on the Start Game button | - | Game does not start. i.e. no action taken | Game does not start |
| TC\_003 | Starting the Game. | Testing Start Game functionality by looking at Tour Guide button. | Launch the app. | Looks at the Tour Guide button for 2 seconds. | - | Tour Guide starts | Game does not start but instead tour guide starts |

In this test, we will perform scenario based test case design for Exit Use-Case:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Test Scenario | Test Case Description | Precondition | Test Steps | Test Data | Expected Results | Actual Result |
| TC\_001 | Exiting the app. | Testing Exit functionality by looking at the Exit button for 2 seconds. | Launch the app. | Look at the Exit button for 2 seconds. | - | App terminated | App terminated. |
| TC\_002 | Exiting the app. | Testing Exit functionality by not looking at the Exit button | Launch the app. | Look anywhere but not on the Exit button | - | App does not terminate. i.e. no action taken | App does not terminate |

**Tour Guide (Module 2) testing**:

In this test, we will perform scenario based test case design for Repeat Tour Use-Case:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Test Scenario | Test Case Description | Precondition | Test Steps | Test Data | Expected Results | Actual Result |
| TC\_001 | Restarting the tour | Testing Restarting the tour functionality by pressing button C. | The user is in the tour. | The user presses Button C. | Button C | The tour is repeated. | The tour is repeated. |
| TC\_002 | Restarting the tour | Testing Restarting the tour functionality by pressing button A. | The user is in the tour. | The user presses button A. | Button A | The main menu appears. | The main menu appears. |
| TC\_003 | Restarting the tour | Testing Restarting the tour functionality by pressing button B. | The user is in the tour. | The user presses Button B. | Button B | No action taken. | No action taken. |
| TC\_003 | Restarting the tour | Testing Restarting the tour functionality by pressing button D. | The user is in the tour. | The user presses Button D. | Button D | No action taken. | No action taken. |

In this test, we will perform scenario based test case design for Exit to Main Menu Use-Case:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Test Scenario | Test Case Description | Precondition | Test Steps | Test Data | Expected Results | Actual Result |
| TC\_001 | Exiting to main menu from tour. | Testing exiting to main menu functionality by pressing button A. | The user is in the tour. | The user presses button A. | Button A | The main menu appears. | The main menu appears. |
| TC\_002 | Exiting to main menu from tour. | Testing exiting to main menu functionality by pressing button C. | The user is in the tour. | The user presses Button C. | Button C | The tour is repeated. | The tour is repeated. |
| TC\_003 | Exiting to main menu from tour. | Testing exiting to main menu functionality by pressing button B. | The user is in the tour. | The user presses Button B. | Button B | No action taken. | No action taken. |
| TC\_003 | Exiting to main menu from tour. | Testing exiting to main menu functionality by pressing button D. | The user is in the tour. | The user presses Button D. | Button D | No action taken. | No action taken. |

**Game Mode (Module 3) testing**:

In this test, we will perform scenario based test case design for Move Player Use-Case:

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Test Scenario | Test Case Description | Precondition | Test Steps | Expected Results | Actual Result |
| TC\_001 | Moving the player. | Testing moving the player functionality by moving 360˚ rocker to right | The user must be in game. | Move the 360 ˚ Rocker to right | Player moved to right. | Player moved to right. |
| TC\_002 | Moving the player. | Testing moving the player functionality by moving 360˚ rocker to left. | The user must be in game. | Move the 360 ˚ Rocker to left | Player moved to left. | Player moved to left. |
| TC\_003 | Moving the player. | Testing moving the player functionality by moving 360˚ rocker upwards. | The user must be in the game. | Move the 360 ˚ Rocker upwards. | No action taken. | No action taken. |

In this test, we will perform scenario based test case design for Play Again Use-Case:

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Test Scenario | Test Case Description | Precondition | Test Steps | Test Data | Expected Results | Actual Result |
| TC\_001 | Playing the game again. | Testing play again functionality by pressing button C. | The user must be in game. | Pressing the Button C. | Button C. | Game is loaded again. | Game is loaded again. |
| TC\_002 | Playing the game again. | Testing play again functionality by pressing button A. | The user must be in game. | Pressing the Button A. | Button A. | User is exited to main menu. | User is exited to main menu. |

**System Testing**

After performing unit testing, in which all the modules were tested one by one, we will perform system testing. System testing is the testing conducted on the system that is integrated and completed. This type of testing allows us to determine whether the system’s modules interact with each other properly or not and whether the inputs given to the system result in the desired output.

The first test case in the following table is to test the flow of the user entering the tour and exiting it.

The second test case in the following table is to test the flow of the user entering the game, playing the game and exiting it.

The third use case in the following table is to test the flow of the user entering the tour, exiting the tour, entering the game and exiting the game and then exiting the app.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Test Case ID | Test Scenario | Test Case Description | Precondition | Test Steps | Test Data | Expected Results | Actual Result |
| TC\_001 | Testing the flow of the user entering the tour and exiting it | The user will enter the tour by gazing at the start tour for 2 seconds, then the user exits the tour with button A. | App is launched. | User gazes at the start tour button for 2 seconds. | - | User enters tour. | User enters tour. |
| User presses Button A to exit the tour | Button A | User exits the tour. | User exits the tour. |
| TC\_002 | Testing the flow of the user entering the game, playing the game and exiting it. | The user will enter the game by gazing at the Start Game for 2 seconds, plays the game and then the user exits the Game with button A. | App is launched. | User gazes at the Start Game button for 2 seconds. | - | User enters the game. | User enters the game. |
| User moves the player right. | Move the 360 ˚ Rocker to right. | Player moves right. | Player moves right. |
| User moves the player left. | Move the 360 ˚ Rocker to left. | Player moves left. | Player moves left. |
| User exits the Game. | Button A | Player exits the game. | Player exits the game. |
| TC\_003 | Testing the flow of the user entering the tour, exiting the tour, entering the game and exiting the game and then exiting the app. | The user will enter the tour by gazing at the start tour button for 2 seconds, then the user will exit the tour by pressing button A, then the user will enter the game by gazing at the start game button, then the user will exit the game by pressing button A, then the user will exit the app by gazing at the exit button for 2 seconds | App is launched | User gazes at the start tour button for 2 seconds. | - | User enters the tour. | User enters the tour. |
| User presses button A to exit the tour. | Button A | User exits the tour | User exits the tour |
| The user gazes at start game button for 2 seconds. | - | User enters the game. | User enters the game. |
| The user exits the game by pressing button A. | Button A | User exits the game. | User exits the game. |
| The user Exits the app by gazing exit button for 2 seconds. | - | App is terminated | App is terminated |