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| --- | --- |
| **ID No.** | **Requirement** |
| R001 | Bluetooth connection with Hardware can be tested within the application |
| R002 | When the user does something “wrong” the application notifies them of what they did and how to correct it. |
| R003 | A freefall experiment is available to view acceleration of a falling object |
| R004 | A freefall experiment is available to view speed of a falling object |
| R005 | A freefall experiment is available to view position of a falling object |
| R006 | A freefall experiment poses questions to students about free fall |
| R007 | A freefall experiment explains a procedure for users to follow within the app |
| R008 | A hardware device provides acceleration data to the application |
| R009 | The hardware device can be thrown around and its motion can be viewed is its tossed |
| R010 | The Hardware device is powered so that either batteries can be changed or recharged easily. |
| R011 | As data is collected a graph is shown so users can associate data with the plots |
| R012 | If more analysis is required a table of taken data can be viewed by user after data completion |
| R013 | The application has room and is modifiable to include more features later on |
| R014 | There’s an option to report issues or give feedback on the application |
| R015 | The application is “understandable” for a physics student. |

Test Suite ID The ID of the test suite to which this test case belongs.

Test Case ID The ID of the test case.

Test Case Summary The summary / objective of the test case.

Related Requirement The ID of the requirement this test case relates/traces to.

Prerequisites Any prerequisites or preconditions that must be fulfilled prior to executing the test.

Test Procedure Step-by-step procedure to execute the test.

Test Data The test data, or links to the test data, that are to be used while conducting the test.

Expected Result The expected result of the test.

Actual Result The actual result of the test; to be filled after executing the test.

Status Pass or Fail. Other statuses can be ‘Not Executed’ if testing is not performed and ‘Blocked’ if testing is blocked.

Remarks Any comments on the test case or test execution.

Created By The name of the author of the test case.

Date of Creation The date of creation of the test case.

Executed By The name of the person who executed the test.

Date of Execution The date of execution of the test.

Test Environment The environment (Hardware/Software/Network) in which the test was executed.

Test ID

|  |  |
| --- | --- |
| Test Suite ID | TS001 |
| Test Case ID | TC001 |
| Test Case Summary | To verify that clicking the Generate Coin button generates coins. |
| Related Requirement | RS001 |
| Prerequisites | 1. User is authorized. 2. Coin balance is available. |
| Test Procedure | 1. Select the coin denomination in the Denomination field. 2. Enter the number of coins in the Quantity field. 3. Click Generate Coin. |
| Test Data | 1. Denominations: 0.05, 0.10, 0.25, 0.50, 1, 2, 5 2. Quantities: 0, 1, 5, 10, 20 |
| Expected Result | 1. Coin of the specified denomination should be produced if the specified Quantity is valid (1, 5) 2. A message ‘Please enter a valid quantity between 1 and 10’ should be displayed if the specified quantity is invalid. |
| Actual Result | 1. If the specified quantity is valid, the result is as expected. 2. If the specified quantity is invalid, nothing happens; the expected message is not displayed |
| Status | Fail |
| Remarks | This is a sample test case. |
| Created By | John Doe |
| Date of Creation | 01/14/2020 |
| Executed By | Jane Roe |
| Date of Execution | 02/16/2020 |
| Test Environment | * OS: Windows Y * Browser: Chrome N |

TS001

|  |  |
| --- | --- |
| Test Suite ID | TS001 |
| Test Case ID | TC002 |
| Test Case Summary | Applicaton remains on main screen for 10 minutes without crashing |
| Related Requirement | R015 |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

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| --- | --- |
| Test Suite ID | TS001 |
| Test Case ID |  |
| Test Case Summary | All “Coming Soon” buttons lead to a “Coming soon” dialog box that explains that the feature is not yet implemented. |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 4/3/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS001 |
| Test Case ID | TC008 |
| Test Case Summary | The “check for updates” button properly informs user if there is an available update for the application |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 4/3/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS001 |
| Test Case ID | TC009 |
| Test Case Summary | The “Report Issue” button opens a dialog box that the user can fill in and send. |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 4/3/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS001 |
| Test Case ID | TC010 |
| Test Case Summary | The app main screen properly resumes from android standby |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 4/3/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS001 |
| Test Case ID | TC011 |
| Test Case Summary | The app can be closed and reopened multiple times without any major issues |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 4/3/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS002 |
| Test Case ID | TC008 |
| Test Case Summary | A button exists to enable and disable the android devices Bluetooth. |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |
| Test Suite ID | TS002 |
| Test Case ID | TC008 |
| Test Case Summary | The Enable/Disable Bluetooth button properly disables the Bluetooth when it is on, or displays a message that it is already off |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS002 |
| Test Case ID | TC009 |
| Test Case Summary | A button exists to discover new pairable Bluetooth devices |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS002 |
| Test Case ID | TC009 |
| Test Case Summary | The Discover button can properly identify the embedded system device |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS002 |
| Test Case ID | TC009 |
| Test Case Summary | The Discover button can properly identify the hardware device |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS002 |
| Test Case ID | TC010 |
| Test Case Summary | Once a device is discovered it can be selected to pair |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS002 |
| Test Case ID | TC010 |
| Test Case Summary | Once a device is paired it a connection can be established with it |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS002 |
| Test Case ID | TC010 |
| Test Case Summary | The Bluetooth connection will be maintained as long as the screen is open up to 30 minutes |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS002 |
| Test Case ID | TC011 |
| Test Case Summary | Clicking the “Get raw data” button shows a set of values from the hardware device. |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone |
| Test Procedure | 1. Open android to app selection screen 2. Tap the MotionBall app icon |
| Test Data | NA |
| Expected Result | 1. App Opens and Displays Main Activity properly |
| Actual Result | 1. Main activity properly displayed |
| Status | Pass |
| Remarks | May want to add a test for repetition of this test case |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS003 |
| Test Case ID | TC013 |
| Test Type | Component |
| Test Case Summary | “Discover” button on graph page successfully finds and displays Bluetooth devices |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone 2. App is opened to Bluetooth connection screen |
| Test Procedure | 1. From Bluetooth test screen click the “return” button |
| Test Data | NA |
| Expected Result | 1. App should return to main page without issue |
| Actual Result | 1. If no actions were taken on page app successfully returned |
| Status | Pass |
| Remarks | App crashes if any connection actions were created before this test, a new test case should be created for this in the next iteration |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS003 |
| Test Case ID | TC013 |
| Test Type | Component |
| Test Case Summary | The “Connect” button on graphing page properly connects to a selected discovered device |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone 2. App is opened to Bluetooth connection screen |
| Test Procedure | 1. From Bluetooth test screen click the “return” button |
| Test Data | NA |
| Expected Result | 1. App should return to main page without issue |
| Actual Result | 1. If no actions were taken on page app successfully returned |
| Status | Pass |
| Remarks | App crashes if any connection actions were created before this test, a new test case should be created for this in the next iteration |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS003 |
| Test Case ID | TC013 |
| Test Type | Component |
| Test Case Summary | “Graph” button properly starts the data collection function |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone 2. App is opened to Bluetooth connection screen |
| Test Procedure | 1. From Bluetooth test screen click the “return” button |
| Test Data | NA |
| Expected Result | 1. App should return to main page without issue |
| Actual Result | 1. If no actions were taken on page app successfully returned |
| Status | Pass |
| Remarks | App crashes if any connection actions were created before this test, a new test case should be created for this in the next iteration |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS003 |
| Test Case ID | TC013 |
| Test Type | Component |
| Test Case Summary | “Graph” periodically updates the graphview with values |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone 2. App is opened to Bluetooth connection screen |
| Test Procedure | 1. From Bluetooth test screen click the “return” button |
| Test Data | NA |
| Expected Result | 1. App should return to main page without issue |
| Actual Result | 1. If no actions were taken on page app successfully returned |
| Status | Pass |
| Remarks | App crashes if any connection actions were created before this test, a new test case should be created for this in the next iteration |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS003 |
| Test Case ID | TC013 |
| Test Type | Component |
| Test Case Summary | The “Stop” button on graphing page successfully stops data collection |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone 2. App is opened to Bluetooth connection screen |
| Test Procedure | 1. From Bluetooth test screen click the “return” button |
| Test Data | NA |
| Expected Result | 1. App should return to main page without issue |
| Actual Result | 1. If no actions were taken on page app successfully returned |
| Status | Pass |
| Remarks | App crashes if any connection actions were created before this test, a new test case should be created for this in the next iteration |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS003 |
| Test Case ID | TC013 |
| Test Type | Component |
| Test Case Summary | “Clear” button completely removes all taken data values. |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone 2. App is opened to Bluetooth connection screen |
| Test Procedure | 1. From Bluetooth test screen click the “return” button |
| Test Data | NA |
| Expected Result | 1. App should return to main page without issue |
| Actual Result | 1. If no actions were taken on page app successfully returned |
| Status | Pass |
| Remarks | App crashes if any connection actions were created before this test, a new test case should be created for this in the next iteration |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS003 |
| Test Case ID | TC013 |
| Test Type | Component |
| Test Case Summary | “Clear” button on graphing page completely removes all taken data values. |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone 2. App is opened to Bluetooth connection screen |
| Test Procedure | 1. From Bluetooth test screen click the “return” button |
| Test Data | NA |
| Expected Result | 1. App should return to main page without issue |
| Actual Result | 1. If no actions were taken on page app successfully returned |
| Status | Pass |
| Remarks | App crashes if any connection actions were created before this test, a new test case should be created for this in the next iteration |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS003 |
| Test Case ID | TC013 |
| Test Type | Component |
| Test Case Summary | Table view successfully displays a table of data |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone 2. App is opened to Bluetooth connection screen |
| Test Procedure | 1. From Bluetooth test screen click the “return” button |
| Test Data | NA |
| Expected Result | 1. App should return to main page without issue |
| Actual Result | 1. If no actions were taken on page app successfully returned |
| Status | Pass |
| Remarks | App crashes if any connection actions were created before this test, a new test case should be created for this in the next iteration |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS003 |
| Test Case ID | TC013 |
| Test Type | Component |
| Test Case Summary | The Free Fall Explanation page describes the experiment to be performed |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone 2. App is opened to Bluetooth connection screen |
| Test Procedure | 1. From Bluetooth test screen click the “return” button |
| Test Data | NA |
| Expected Result | 1. App should return to main page without issue |
| Actual Result | 1. If no actions were taken on page app successfully returned |
| Status | Pass |
| Remarks | App crashes if any connection actions were created before this test, a new test case should be created for this in the next iteration |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS003 |
| Test Case ID | TC013 |
| Test Type | Component |
| Test Case Summary | The “Questions” button links to questions to make users think about what they’re about to do. |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone 2. App is opened to Bluetooth connection screen |
| Test Procedure | 1. From Bluetooth test screen click the “return” button |
| Test Data | NA |
| Expected Result | 1. App should return to main page without issue |
| Actual Result | 1. If no actions were taken on page app successfully returned |
| Status | Pass |
| Remarks | App crashes if any connection actions were created before this test, a new test case should be created for this in the next iteration |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |

|  |  |
| --- | --- |
| Test Suite ID | TS003 |
| Test Case ID | TC013 |
| Test Type | Component |
| Test Case Summary | The “Procedure” button directs the user on how to perform the free fall experiment. |
| Related Requirement |  |
| Prerequisites | 1. App is downloaded and installed on Android phone 2. App is opened to Bluetooth connection screen |
| Test Procedure | 1. From Bluetooth test screen click the “return” button |
| Test Data | NA |
| Expected Result | 1. App should return to main page without issue |
| Actual Result | 1. If no actions were taken on page app successfully returned |
| Status | Pass |
| Remarks | App crashes if any connection actions were created before this test, a new test case should be created for this in the next iteration |
| Created By | Alex Gauf |
| Date of Creation | 3/21/2018 |
| Executed By | Alex Gauf |
| Date of Execution | 4/1/2018 |
| Test Environment | * Android OS |