Test Plan and Results

**main**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | Actual Results |
| choice | valid | 3 | The *deleteStudent* module is called. | The *deleteStudent* module was called. |
| Invalid | -1 | Error message is displayed, and user is prompted to re-enter choice. | Error message was displayed. |
| extreme | 2w | Program will crash. | The *makeSale* module was called. |

**retrieveBooks**

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Test Data | Expected Results | Actual Results |
| Book file | Populated | The book list array is populated, and updated book count is returned. | The book list array is populated, and updated book count is returned |
| Empty | Function will return count value 0. A message indicating file unavailability will be displayed. | A book count of zero is returned. |

**retrieveStudents**

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Test Data | Expected Results | Actual Results |
| Student file | Populated | The student list array is populated, and updated student count is returned. | The student list array was populated, and updated book count was returned |
| Empty | Function will return count value 0. A message indicating file unavailability will be displayed. | A message indicating file unavailability was displayed. A student count of zero was returned. |

**displayMenu**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | Actual Results |
| choice | valid | 1 | Value returned to main module | Value returned to main module. |
| invalid | 5 | Error message is displayed, and user is prompted to re-enter choice. | Error message was displayed, and user was prompted to re-enter choice. |
| extreme | 2w | Program will crash. | Only the digit 2 was read and returned to main module. |

**checkStudent**

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Test Data | Expected Results | Actual Results |
| ID | Existing student | The value of *newStudent* is updated. | The value of *newStudent* was updated. |
| New Student | The initialised value of *newStudent* does not change. | The initialised value of *newStudent* did not change. |

**addStudent**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | Actual Results |
| idNum | valid | 1234 | Value is passed to *checkStudent* module. | Value was passed to *checkStudent* module. |
| Invalid | -1234 | Error message is displayed, and user is prompted to re-enter ID number. | Error message was displayed, and user was prompted to re-enter ID number. |
| Extreme | 1gyg3 | Program will crash. | The program continued and only the digit 1 was read. |
| studList[sCount].name | valid | Anika Duffus | The string is read. | The string was read. |
| invalid | AnikaDuffus | The string is read. | The string was read. |
| extreme | Empty string | The program will not continue. | The program continued, and nothing was stored in the variable. |

**readBook**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | | Actual Results |
| bookList[bCount].serialNum | valid | qwerty | The string is read. | The string was read. | |
| invalid | qwertyyuio | Only qwertyyui is read | The entire string was read. | |
| extreme | Empty string | The program will not continue. | The program did not continue. | |
| bookList[bCount].title | valid | Simple Program Design | The string is read. | The string was read. | |
| invalid | Simp Priwh dENGN | The string is read. | The string was read. | |
| extreme | Empty string | The program will not continue. | The program continued. Nothing was stored in variable. | |
| bookList[bCount].author | valid | Anika Duffus | The string is read. | The string was read. | |
| invalid | AnikaDuffus | The string is read. | The string was read. | |
| extreme | Empty string | The program will not continue. | The program continued. Nothing was stored in variable. | |
| bookList[bCount].price | valid | 2500 | The value is read. | The value was read. | |
| invalid | -78878 | Error message is displayed to prompt user to re-enter price. | Error message was displayed. | |
| extreme | 5ydw | Program will crash. | Only the digit 5 was read. | |
| bookList[bCount].subject | valid | math | The string is read. | The string was read. | |
| invalid | MatH | The string is read. | The string was read. | |
| extreme | Empty string | The program will not continue. | The program continued. Nothing was stored in variable. | |

**makeSale**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | Actual Results |
| curr\_choice | valid | yes | The user is prompted to enter the serial number of chosen book. | The user was prompted to enter the serial number of chosen book. |
| invalid | YEs | The user is prompted to enter the serial number of chosen book. | The user was prompted to enter the serial number of chosen book. |
| extreme | 23efs | The user prompted to enter a choice. | The user was prompted to enter a choice. |
| final\_choice | valid | yes | While loop is re-entered. | While loop was re-entered. |
| invalid | Y3s | While loop is terminated. | While loop was terminated. |
| extreme | 23efs | While loop is terminated. | While loop was terminated. |

**displayBooks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | Actual Results |
| subject | ------------ | Existing subject | The user is prompted to enter the title of wanted book. | The user was prompted to enter the title of wanted book. |
| ------------- | Non-existing subject | An error message is displayed which indicates the unavailability of the subject. | An error message was displayed. |
| Array of subject books | ------------- | Populated | The user is prompted to enter the title of the desired book. | The user was prompted to enter the title of the desired book. |
| Empty | A message indicating the unavailability of books for that subject is displayed. | The message was displayed. |
| choice | valid | yes | Sale status of book is updated. String for the serial number of book is stored in *bookID* variable. | Sale status of book was updated. String for the serial number was stored. |
| invalid | YEs | Sale status of book is updated. String for the serial number of book is stored in *bookID* variable. | Sale status of book was updated. String for the serial number was stored. |
| extreme | 23efs | The for loop is re-entered. | The for loop was re-entered. |

**readSubject**

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Test Data | Expected Results | Actual Results |
| subject | Available books | An array is populated with the relevant books. The subject book count is updated. | An array was populated with the relevant books. The subject book count was updated. |
| Unavailable books | A message is displayed to indicate that there are no books for the subject. | A message was displayed to indicate that there are no books for the subject. |

**calcTotal**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | Actual Results |
| bookSold.price | valid | 2500 | Value added to total owed of owner of book sold | Value was added to total owed of owner of book sold |
| invalid | -4486 | The function is not called. | The function was not called. |
| extreme | 4t55ee | Program will crash. | The first digit was added to the total owed of the owner of the book sold. |

**deleteBook**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | Actual Results |
| bookID | valid | qwerty | The array of books and the book count are updated. | The array of books and the book count were updated. |
| invalid | qWERTh | The array of books and the book count are not updated. | The array of books and the book count are updated. However, the first element is removed from the array instead of the intended element. |
| extreme | Empty string | The function will not be called. | The function was not called. |

**printTotalOwed**

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Test Data | Expected Results | Actual Results |
| studList[i].total\_owed | Greater than zero | The student information is written to file. *studList[i].total\_owed* is re-initialised to zero. | The student information was written to file. *studList[i].total\_owed* was re-initialised to zero. |
| Equal to zero | The student information is not written to file. | The student information was not written to file. |

**saveBooks**

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Test Data | Expected Results | Actual Results |
| Book file | Populated | The books sold are removed from the file. | The books sold were removed from the file. |
| Empty | The current book list is written to file. | The current book list was written to file. |

**saveStudents**

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Test Data | Expected Results | Actual Results |
| Student file | Populated | The students’ information is rewritten to file. | The students’ information was rewritten to file. |
| Empty | The students’ information is written to file. | The students’ information was written to file. |

**deleteStudent**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | Actual Results |
| studID | valid | Existing student | The total owed and the owned and unsold books for the student are displayed; a message is displayed to indicate if there are no books to be returned. The student and book array and count are updated. | The information was displayed. The student and book array and count are updated. |
| invalid | Non-existing student | The module terminates and control returned to main menu. | The module terminated. |

**findStudent**

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Test Data | Expected Results | Actual Results |
| studID | Existing student | The array index (position of the student in the array) is returned. | The array index was returned. |
| Non-existing student | A message indicating that the student was not found is displayed and the value negative one (-1) is returned. | The message was displayed and the value negative one (-1) was returned. |

**displayReportMenu**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | Actual Results |
| choice | valid | 1 | Value returned to main module | Value returned to main module. |
| invalid | 5 | Error message is displayed, and user is prompted to re-enter choice. | Error message was displayed, and user was prompted to re-enter choice. |
| extreme | 2w | Program will crash. | Only the digit 2 was read and returned to main module. |

**reportMain**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | Actual Results |
| choice | valid | 1 | The *printTotalOwed* module is called. | The *printTotalOwed* module was called. |
| Invalid | -1 | Error message is displayed, and user is prompted to re-enter choice. | Error message was displayed. |
| extreme | 2w | Program will crash. | The *displaySubjCount* module was called. |

**displaySubjBooks**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Item | Category | Test Data | Expected Results | Actual Results |
| subject | valid | Existing subject | The specified subject book list file is created, and the names and quantities of the relevant books are written to file. | The file was created the book information was written to file. |
| invalid | Non-existing subject | A message which indicates the non-existence of the inputted subject choice is displayed. | The message was displayed. |

**displaySubjCount**

|  |  |  |  |
| --- | --- | --- | --- |
| Item | Test Data | Expected Results | Actual Results |
| Array of books | Populated | The subjects and the number of books under each category are written to file. | The subjects and the number of books under each category were written to file. |
| Empty | A message indicating that there are no books listed is displayed. | The message was displayed. |