# Programming Project 7 – Rational Number Test Plan

# Name: Aplomb Huang

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| rationalNum1 | rationalNum2 | Action Performed | Expected Change | Actual Change |
| 1/2 | 1/3 | Addition | 5/6 | 5/6 |
| 3/4 | 4/5 | subtraction | -1/20 | -1/20 |
| 0/1 | 2/2 | Multiplication | 0/2 | 0/2 |
| 5/6 | -6/7 | Division | -35/36 | -35/36 |
| 7/8 | 8/9 | Equality test | False | False |
| 8/10 | 4/5 | Equality test | True | True |
| 4/5 | 8/10 | Equality test | True | True |
| 8/10 | 12/15 | Equality test | True | True |
| 4/5 | 12/15 | Equality test | True | True |
| -1/4 | -4/1 | Multiplication | 1 | 1 |
| -1/4 | -4/1 | Multiplication | 1 | 1 |
| -1/4 | -4/1 | Multiplication | 1 | 1 |
| 2/3 | 2/-3 | Addition | 0/3 | 0/3 |
| 2/-3 | 0/3 | Division | Cannot calculate | Cannot calculate |
| 2/3 | 1/-3 | Multiplication | -2/9 | -2/9 |

The data sheet above recorded tests for logical errors, so the data input will be in the correct form. Run time error testing is in the second sheet below.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Numerator | Denominator | Type of error | Expected message | Actual message |
| TNT |  | Illegal type of entry | Please enter an integer | Please enter an integer |
| :-) |  | Illegal type of entry | Please enter an integer | Please enter an integer |
| A |  | Illegal type of entry | Please enter an integer | Please enter an integer |
| :-D |  | Illegal type of entry | Please enter an integer | Please enter an integer |
| “ ”(empty space) |  | Empty entry | Continue to wait for an entry(not a message displayed) | Continue to wait for an entry(not a message displayed) |
| 3.1415926 |  | Illegal type of entry | Please enter an integer | Please enter an integer |
| -9.80292 |  | Illegal type of entry | Please enter an integer | Please enter an integer |
|  | 2.99792458 | Illegal type of entry | Please enter an integer | Please enter an integer |
|  | -0.0001 | Illegal type of entry | Please enter an integer | Please enter an integer |
|  | T\_T | Illegal type of entry | Please enter an integer | Please enter an integer |
|  | :-( | Illegal type of entry | Please enter an integer | Please enter an integer |
|  | “ ”(empty space) | Empty entry | Continue to wait for an entry(not a message displayed) | Continue to wait for an entry(not a message displayed) |
|  | ATRH | Illegal type of entry | Please enter an integer | Please enter an integer |
|  | a | Illegal type of entry | Please enter an integer | Please enter an integer |
|  | 0 | Logically not allowed | Denominator cannot be zero, please re-enter | Denominator cannot be zero, please re-enter |

**The following testing data sheet shows tests for extreme data and boundaries**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| rationalNum1 | rationalNum2 | Action Performed | Expected Change | Actual Change |
| 1/999 | 1/19999 | Addition | 20998/19979001 | 20998/19979001 |
| 19999/-1 | 9999/-2 | Addition | -49997/2 | -49997/2 |
| 0/1 | 0/-1 | Addition | 0/1 | 0/1 |
| 9998/99999 | 19998/29999 | Addition | 1995257292/1295097295 | 1995257292/1295097295 |
| 1/999 | 1/19999 | subtraction | 19000/19979011 | 19000/19979011 |
| 19999/-1 | 9999/-2 | subtraction | -29999/2 | -29999/2 |
| 0/1 | 0/-1 | subtraction | 0/1 | 0/1 |
| 9998/99999 | 19998/29999 | subtraction | -1699850000  /1295097295 | -1699850000/-1295097295  due to overflow of int memory space |
| 1/999 | 1/19999 | Multiplication | 1/19979001 | 1/19979001 |
| 19999/-1 | 9999/-2 | Multiplication | 199970001/2 | 199970001/2 |
| 0/1 | 0/-1 | Multiplication | 0/1 | 0/1 |
| 9998/99999 | 19998/29999 | Multiplication | 199940004/  1295097295 | -199940004/1295097295  due to overflow of int memory space |
| 1/999 | 1/19999 | Division | 19999/999 | 19999/999 |
| 19999/-1 | 9999/-2 | Division | 39998/9999 | 39998/9999 |
| 0/1 | 0/-1 | Division | Cannot calculate | Cannot calculate |
| 9998/99999 | 19998/29999 | Division | 299930002/1999780002 | 299930002/1999780002 |