SOFTWARE ENGINEERING

LAB 08

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1]

Equivalence Partitioning

Identified Equivalence Classes:

1. Valid Dates:

1 <= month <= 12

Day should be valid for the given month and year (considering leap years).

1900 <= year <= 2015

2. Invalid Dates:

Month out of range (e.g., 0, 13).

Invalid days for a valid month (e.g., February 30, April 31).

Year out of range (e.g., 1899, 2016).

Test Cases Using Equivalence Partitioning

|  |  |
| --- | --- |
| Tester Action and Input Data | Expected Outcome |
| 15,8,2015 | 14,8,2015 |
| 1,1,1900 | 31,12,1899 |
| 29,2,2012 | 28,2,2012 |
| 31,4,2015 | Error |
| 15,13,2015 | Error |
| 1,0,2015 | Error |
| 31, 1, 1900 | 30, 1, 1900 |
| 30,2,2015 | Error |
| 1,3,2015 | 28,2,2015 |

Boundary Value Analysis

Identified Boundary Values:

1. Lower and upper limits for year, month, day.

2. Special cases for days in months (end of month, leap years).

Test Cases Using Boundary Value Analysis

|  |  |
| --- | --- |
| Test Action and Input Data | Expected Outcome |
| 1 , 1, 1900 | 31, 12, 1899 |
| 1, 1, 2015 | 31,12,2014 |
| 1,12, 2015 | 30,11,2015 |
| 1,2,2012 | 31,1,2012 |
| 29,2,2015 | An Error Message |
| 30,4,2015 | 29,4,2015 |
| 1,12,1900 | 30,11,1900 |
| 31,12,2015 | 30,12,2015 |
| 29,2,2016 | 28,2,2016 |

2]

Identify the Equivalence Classes

Valid Triangle Classes:

Equilateral: All sides equal.

Isosceles: Exactly two sides equal.

Scalene: All sides different.

Right-Angled: Follows Pythagorean theorem (a² + b² = c²).

Invalid Triangle Classes:

Non-triangle: The sum of any two sides must be greater than the third side.

Non-positive lengths: Any side length is less than or equal to zero.

Test Cases for the Equivalence Classes

|  |  |  |
| --- | --- | --- |
| Test Case | Input | Outcome |
| TC 1 | 3,3,3 | Valid |
| TC 2 | 3,4,3 | Valid |
| TC 3 | 1,2,3 | Invalid |
| TC 4 | -1,2,3 | Invalid |
| TC 5 | 3,4,5 | Valid |
| TC 6 | 3,4,6 | Valid |

Boundary Condition A + B > C (Scalene Triangle)

To test the boundary condition where the sum of two sides equals the third side:

|  |  |  |
| --- | --- | --- |
| Test Case | Input | Expected Outcome |
| TC 7 | 2,3,5 | Invalid |
| TC 8 | 3,4,7 | Invalid |
| TC 9 | 3,4,6 | Scalene |

Boundary Condition A = C (Isosceles Triangle)

To test the case where two sides are equal:

|  |  |  |
| --- | --- | --- |
| Test Case | Input | Expected Outcome |
| TC 10 | 3,4,3 | Valid |
| TC 11 | 5,5,3 | Valid |
| TC 12 | 1,1,2 | Boundary |

Boundary Condition A = B = C (Equilateral Triangle)

To test the equilateral triangle condition:

|  |  |  |
| --- | --- | --- |
| Test Case | Input | Expected Outcome |
| TC 13 | 2,2,2 | Equilateral |
| TC 14 | 0,0,0 | Invalid |
| TC 15 | 1,1,1 | Valid |

Boundary Condition A² + B² = C² (Right-Angled Triangle)

To verify the right-angled triangle condition:

|  |  |  |
| --- | --- | --- |
| Test Case | Input | Expected Outcome |
| TC 16 | 3,4,5 | Right Angled |
| TC 17 | 1,1,2 | Invalid |

Non-Triangle Case Test Cases

To explore the boundaries of non-triangle conditions:

|  |  |  |
| --- | --- | --- |
| Test Case | Input | Expected Outcome |
| TC 18 | 1,2,3 | Invalid |
| TC 19 | 5,10,15 | Invalid |
| TC 20 | 7,3,10 | Invalid |

Non-Positive Input Test Points

To check non-positive input values:

|  |  |  |  |
| --- | --- | --- | --- |
| Test Case | Input | Expected Outcome | Notes |
| TC 21 | 0,3,4 | Invalid | Non-positive |
| TC 22 | -1,2,3 | Invalid | Non-positive |
| TC 23 | 1,-2,3 | Invalid | Non-positive |