IT-314 Software Engineering

Lab 10

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Lab Group: 2

QUESTION 1

Equivalence Partitioning:

Input Data	Expected Outcome
day = 14, month = 6, year = 2000	day = 13, month = 6, year = 2000
day = 1, month = 1, year = 1990	day = 31, month = 12, year = 1989
day = 30, month = 12, year = 2015	day = 29, month = 12, year = 2015
day = 25, month = 10, year = 2000	day = 24, month = 10, year = 2000
day = 210, month = 12, year = 2015	An error message
day = 15, month = 23, year = 2000	An error message
day = 15, month = 6, year = 1801	An error message
day = 15, month = 6, year = 2035	An error message

Boundary Value Analysis:

Input Data	Expected Outcome
day = 1, month = 6, year = 2000	day = 31, month = 5, year = 2000
day = 31, month = 6, year = 2000	day = 30, month = 6, year = 2000
day = 1, month = 1, year = 1900	day = 1, month = 1, year = 1899
day = 31, month = 12, year = 2015	day = 30, month = 12, year = 2015
day = 0, month = 13, year = 2001	An error message
day = 15, month = 6, year = 2016	An error message
day = 15, month = 6, year = 1899	An error message

QUESTION 2

a) Identify the equivalence classes for the system:

1. Equilateral Triangle: A = B = C
2. Isosceles Triangle: A = B ≠ C or A = C ≠ B or B = C ≠ A
3. Scalene Triangle: A ≠ B ≠ C
4. Right-Angled Triangle: A^2 + B^2 = C^2 (Pythagorean Theorem)
5. Non-triangle (A, B, or C is invalid): A + B ≤ C or A + C ≤ B or B + C ≤ A
6. Non-positive input: A, B, or C is less than or equal to 0

b) Identify test cases to cover the identified equivalence classes:

1. Equilateral Triangle:
- (A = 3, B = 3, C = 3)

- (A = 5.5, B = 5.5, C = 5.5)

2. Isosceles Triangle:
- (A = 4, B = 4, C = 5)
- (A = 5, B = 6, C = 5)

3. Scalene Triangle:
- (A = 3, B = 4, C = 5)
- (A = 7.5, B = 6, C = 8)

4. Right-Angled Triangle:
- (A = 3, B = 4, C = 5)
- (A = 5, B = 12, C = 13)

5. Non-triangle (A, B, or C is invalid):
- (A = 1, B = 2, C = 3) # Does not form a triangle
- (A = 6, B = 6, C = 12) # Does not form a triangle

6. Non-positive input:
- (A = -2, B = 3, C = 4)
- (A = 2, B = 0, C = 3)
- (A = 4, B = 5, C = -1)

c) For the boundary condition A + B > C case (scalene triangle):
- (A = 1, B = 1, C = 2) # A + B = 2 (Boundary)
- (A = 1, B = 2, C = 3) # A + B = 3 (Inside the boundary)
- (A = 2, B = 2, C = 4) # A + B = 4 (Outside the boundary)

d) For the boundary condition A = C case (isosceles triangle):
- (A = 3, B = 4, C = 3) # A = C (Boundary)
- (A = 4, B = 4, C = 5) # A = C (Inside the boundary)
- (A = 2, B = 5, C = 2) # A = C (Outside the boundary)

e) For the boundary condition A = B = C case (equilateral triangle):
- (A = 5, B = 5, C = 5) # A = B = C (Boundary)
- (A = 6, B = 6, C = 6) # A = B = C (Inside the boundary)

- (A = 4, B = 4, C = 4.1) # A = B = C (Outside the boundary)

f) For the boundary condition A^2 + B^2 = C^2 case (right-angle triangle):

- (A = 3, B = 4, C = 5) # A^2 + B^2 = C^2 (Boundary)
- (A = 5, B = 12, C = 13) # A^2 + B^2 = C^2 (Inside the boundary)
- (A = 7, B = 24, C = 25) # A^2 + B^2 = C^2 (Outside the boundary)

g) For the non-triangle case, identify test cases to explore the boundary:

- (A = 1, B = 1, C = 1) # Does not form a triangle (Boundary)
- (A = 1, B = 2, C = 5) # Does not form a triangle (Inside the boundary)
- (A = 3, B = 4, C = 8) # Does not form a triangle (Outside the boundary)

h) For non-positive input, identify test points:

- (A = -1, B = 2, C = 3) # Non-positive A
- (A = 4, B = 0, C = 5) # Non-positive B
- (A = 6, B = 7, C = -2) # Non-positive C