Group 15

Lab Session – Specification-based Test Case Generation

1. Consider a program for determining the previous date. Its input is triple of day, month and year with the following ranges 1 <= month <= 12, 1 <= day <= 31, 1900 <= year <= 2015.The possible output dates would be previous date or invalid date. Design the equivalence class test cases?

Conditions for Valid Input:

1. Date: 1 <= day <=31
2. Month: 1 <= month <=12
3. Year: 1900 <= year <= 2015

Equivalence Classes:

- Month:
    - M1 : Months with 31 days (1,3,5,7,8,10,12)
    - M2 : Month with 30 days (4,6,9,11)
    - M3 : Month with 28/29 days (2)
    - M4 : Month < 1
    - M5 : Month > 12

- Day:
    - D1: 1<= Day <= 28
    - D2: Day = 29
    - D3: day = 30
    - D4: day = 31
    - D5: day < 1
    - D6: day > 31

- Year:
    - Y1: leap year
    - Y2: non-leap year
    - Y3: year > 2015
    - Y4: year < 1900

Test Cases using Equivalence Classes:

Sr No.	Day	Month	Year	Output
1.	D1	M1/M2	Y1/Y2	Previous Date
2.	D2	M1/M2	Y1/Y2	Previous Date
3.	ANY	ANY	Y3	Invalid
4.	ANY	ANY	Y4	Invalid
5.	D5	ANY	ANY	Invalid

6.	D6	ANY	ANY	Invalid
7.	ANY	M4	ANY	Invalid
8.	ANY	M5	ANY	Invalid
9.	D3	M3	ANY	Invalid
10.	D2	M3	Y1	Previous Date
11.	D2	M3	Y2	Invalid
12.	D4	M2	ANY	Invalid
13.	D3	M2	Y1/Y2	Previous Date
14.	D4	M3	ANY	Invalid

Test Cases using Boundary Value Analysis

Test Case	**Day**	**Month**	**Year**	**Output**
1	1	6	2000	31-5-2000
2	1	1	1900	31-12-1899
3	1	12	2000	30-11-2000
4	15	6	2000	14-6-2000
5	30	6	2000	29-6-2000
6	31	6	2000	Invalid
7	2	6	2000	1-6-2000
8	1	2	2000	31-1-2000
9	1	11	1900	31-10-1900
10	1	12	1901	30-11-1901
11	31	12	2015	30-12-2015
12	1	12	2014	30-11-2014
13	15	6	1958	14-6-1958

Code:
https://ide.geeksforgeeks.org/uM2N6xVNSr

2. The system accepts a five-digit numeric item ID number from 00000 to 99999. The system accepts a quantity to be ordered, from 1 to 99. If the user enters a previously ordered item ID and a 0 quantity to be ordered, that item is removed from the shopping cart. Based on these inputs, the system retrieves the item price, calculates the item total (quantity times item price), and adds the item total to the cart total. Due to limits on credit card orders that can be processed, the maximum cart total is $999.99

Conditions for Valid Input:

1. ID: 00000-99999
2. Quantity: 0-99
3. Maximum cart total ≤ $999.99

Equivalence Classes:

- ID
  - I1: 00000 ≤ ID ≤ 99999 : Valid
  - I2: ID < 00000 : Invalid
  - I3: ID > 99999 : Invalid

- Quantity
  - Q1: 0 : Valid/Invalid
  - Q2: 1 <= quantity <= 99 : Valid
  - Q3: quantity < 0 : Invalid
  - Q4: quantity > 99 : Invalid

- Cart total (in dollars)
  - C1: 0 ≤ cart total ≤ 999.99 : Valid
  - C2: cart total > 999.99 : Invalid

Let us assume that the cart total is $200 (for some selected items) and the price of an item with ID 11111 is $100.

Test Case	Input Data	Outcome
I2	-11111	ERROR
I3	100001	ERROR
Q3	ANY	ERROR
Q4	ANY	ERROR
I1	ID = 11111	Item Price = $100

C1	ID = 11111
	Quantity = 7
		Cart Total = $900

C2	ID = 11111
	Quantity = 2
		ERROR
		Cart Total = $1100
		(error since > 999.99)

Q1	ID = 11111
	Quantity = 0
		Item with ID = 11111 removed from the cart (if the item is in the cart)
		Cart Total = $200

Q1	ID = 11111	ERROR (If item with ID = 11111 is not in the cart)