

Lab Assignment 9

Q1. Consider a program for determining the previous date. Its input is triple of day, month and year with the following ranges $1 \leq \text{month} \leq 12$, $1 \leq \text{day} \leq 31$, $1900 \leq \text{year} \leq 2015$. The possible output dates would be a previous date or invalid date. Design the equivalence class test cases?

Answer)

Equivalence Class:

Days :

- Day1: $1 \leq \text{Day} \leq 28$ (valid)
- Day2: Day=29 (valid)
- Day3: Day=30 (valid)
- Day4: Day=31 (valid)
- Day5: $-\infty < \text{Day} < 1$ (Invalid)
- Day6: Day>31 (Invalid)

Months :

- Month1: This includes months having 31 days. The months are January(1), March(3), May(5), July(7), August(8), October(10), December(10). (valid)
- Month2: This includes months having 30 days. The months are April(4), June(6), September(9), November(11) (valid)
- Month3: This includes months having 28 or 29 days (because of leap year). The month is February(2). (valid)
- Month4: $-\infty < \text{Month} < 1$ (Invalid)
- Month5: Month>12 (Invalid)

Years :

- Year1: Leap years in $1900 \leq \text{Year} \leq 2015$ (valid)
- Year2: Non Leap years in $1900 \leq \text{Year} \leq 2015$. (valid)
- Year3: Year >2015 (Invalid)
- Year4: $-\infty < \text{Year} < 1900$ (Invalid)

Test Cases:

Test Cases	Day	Month	Year	Output
A month with 30 days	Day3	Month2	Year1 year2	Previous date
A month with 1 to 28 days	Day1	Month1 Month2 Month3	Year1 year2	Previous date
A month with 29 days	Day2	Month1 Month2	Year1 year2	Previous Date

Feb 29 in leap year	Day2	Month3	Year1	Previous Date
Feb 29 in non leap year	Day2	Month3	Year2	Invalid
A month with 31 days	Day4	Month1	Year1 Year2	Previous Date
Day<1 Day>31	Day5 Day6	Month2 month3 month1	Year1 Year2	Invalid
Year>2015 Year<1900	Day1 Day2 Day3	Month2 month3 month1	Year 3 Year 4	Invalid
1<month month>12	Day1 Day2 Day3	Month4 Month5	Year1 Year2	Invalid
All inputs are invalid	Day5 Day6	Month4 Month5	Year 3 Year 4	Invalid
1<=Day<=31	Day1 Day2 Day3 Day4	Month4 Month5	Year 3 Year 4	Invalid
1900<=Year<=2015	Day5 Day6	Month4 Month5	Year1 Year2	Invalid
1<=Month<=12	Day5 Day6	Month2 month3 month1	Year 3 Year 4	Invalid

Q2. You are testing an e-commerce system that sells products like caps and jackets. The problem is to create functional tests using boundary-value analysis and equivalence class partitioning techniques for the web page that accepts the orders. A screen prototype for the order-entry web page is shown below.

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.

Answer)

Equivalence Classes :

Item ID :

- I1 : ID < 0 (Invalid)
- I2 : ID > 99999 (Invalid)
- I3 : 0 ≤ ID ≤ 99999 (valid)

Quantity :

- Q1 : Q < 0 (Invalid)
- Q2 : Q > 99 (Invalid)
- Q3 : 0 < Q ≤ 99 (valid)
- Q4 : Q = 0 (Item removed based on Item ID)

Cart Total :

- CT1 : 0 < CT ≤ 999.99 (valid)
- CT2 : CT > 999.99 (Invalid)
- CT3 : CT = 0 (Invalid)

Test Cases	ID	Quantity	Cart Total (CT)	Output
ID < 0	$(-\infty, -1]$	Any	Any	Invalid
ID > 99999	$[100000, \infty)$	Any	Any	Invalid

Q<0	I3	$(-\infty, -1]$	Any	Invalid
Q=0	I3	0	Any	Valid (Item removed from cart)
Q=0	I1	0	Any	Invalid
Q=0	I2	0	Any	Invalid
Q>99	I3	$[100, \infty)$	Any	Invalid
Cart Total >999.99	I3	Q3	$[1000, \infty)$	Invalid
Cart Total = 0	I3	Q3	0	Invalid
$0 < \text{Cart Total} < 999.99$	I3	Q3	CT1	Valid (Order processed)
ID=0	Boundary Value	Q3	CT1	Valid
ID=-1	Boundary Value	Any	Any	Invalid
ID=100000	Boundary Value	Any	Any	Invalid
ID=99999	Boundary Value	Q3	CT1	Valid