

Not a quadratic equation.  
 $a = 0$   
 $b = 100$   
 $c = 100$

Enter value  
of  $a, b, c$

## Takarshan Bhardwaj QUESTION-1

2015041  
CE

Q. Generate test case using equivalence testing to calculate standard deduction on taxable income. The standard deduction is higher for tax payers who are 65 or older or blind. Use the method given below to calculate tax. The first factor that determines standard deduction is filing status. The basic standard deduction for various filing status are:

Singer : Rs 47,500

Married, joint : Rs 95,000

Married, separate : Rs 70,000

Married, filing a separate : Rs 70,000

If a married couple filing separate return & one spouse is not taking a standard deduction, the other spouse is also not eligible for standard deduction and additional Rs 10,000 is allowed as standard deduction if either the filer is 65 years or the spouse is 65 years or older (married and filing is joint) additional Rs 10000 is allowed as standard deduction. If the filer is blind or spouse is blind (married and filing status is joint).

Test Case Id	Summary	Dependency	Pre-condition	Post-condition	TIR	Execution Step
TC-1	Singer is firing	-	-	Tax value	9000	Enter status, exight, class, Age
TC-2	Age < 65, Singer	-	-	Tax value	9000	Enter status, exight, class, Age
TC-3	Blind	Age < 65, Single	-	Tax value	9000	Enter status, exight, age
TC-4	Separate gerunn, married	-	-	Tax amount	9000	Input age, exight, 2000

TC-4	Age is 0	Status neither single nor married	Eyeight is neither blind nor not blind	Class is neither approach nor joint
TC-5	-	-	-	-
TC-6	Age is 0	Status neither single nor married	Eyeight is neither blind nor not blind	Class not valid
TC-7	-	-	-	-
TC-8	9000	Input age, eyeight, status, class	9000 Input age, status, eyeight, class	9000 Error message
TC-9	9000	Status is invalid	Age is not value	9000 Error message
TC-10	9000	Input age, eyeight, status, class	Eyeight is not valid	9000 Error message
TC-11	9000	Input age, status, eyeight, class	Class not valid	9000 Error message

TC-9	status is single, age is > 65	Tax Amount	10000	Input age, eyesight class	4250
TC-10	status is single, blind	Tax Amount	—	Input age, eyesight class	4250
TC-11	Status is married, class is superior	Tax Amount	10000	Input age, eyesight class	3000
TC-12	Age > 65, blind	Tax Amount	10000	Input age, eyesight class	3250

14	Film is blind, joint between	-	-	
15	Robust	Status is neither single nor married	-	
	Tan Amount	100000	Input Age: 500	
			Eyegift Status Class	

TC-16	Age is 0	-	Age is invalid error message.
TC-17	Eye sight is neither blind nor nonblind	-	Eyeight is invalid error message.
TC-18	Class is neither supernate nor joint	-	Input age, eyesight, status, class error message.
19	Status is invalid, age is 0	-	Input age, eyesight, status, class error message.

TC-20	Age is 0, eye sight is invalid	-	Status is invalid
TC-21	Status is invalid, class is invalid	-	Status is invalid, eye sight is invalid
TC-22	Age is 0, eye sight is invalid	-	Status is invalid
TC-23	Age is 0, class is invalid	-	Status is invalid

TC - 24  
Age is 0,  
Eyesight is  
invalid,  
class is  
invalid

Eyesight is  
invalid,  
class is  
invalid

input age,  
eyesight,  
status, class

Age is 0,  
Eyesight is  
neither  
blind nor  
not blind  
class is  
invalid

Age,  
Eyesight,  
Class are  
invalid

input age,  
eyesight,  
status, class

error  
message

## QUESTION - 2

The commission problem includes a sales person. The sales person sold rifle locks, stocks and barrel made by a gunsmith, costs of lock is \$45, stock is \$30 and barrel is \$25. The sales person had to sell at least one complete rifle per month and the production limit were such that the most the sales person could sell in a month was 70 locks, 80 stocks, 90 barrels. After each town visit the sale person sends a telegram to the gunsmith with the no. of locks, stocks and barrels sold in each town. At the end of the month, the sales person sends a very short telegraph showing 1 lock sold. When the gunsmith get this message, he knows that the sales for the month is complete and compute the salesperson's comision. It is as follows :-

On sale upto (and including) \$1000 = 10%, On sale upto (and including) \$1800 = 15%, On sales in excess of \$1800 = 2%

Derive test case using Boundary value analysis

	Pre-condition	Post-condition	Input	Execution step	Expect o/p	Actual o/p.
TC-1 worst normal	locks sold are at boundary, stocks and barrel are valid.	-	Commission amount	$L=1$ $S=79$ , $B=69$	Input the no. of locks, stocks & barrel	708 fail
TC-2	Stocks are sold at boundary locks and barrel are valid	Barrels are at boundary locks and stocks are valid.	Commission amount	$L=20$ , $S=1$ , $B=20$	Input no. of stocks, barrel	164 fail
TC-3	Strong normal	locks, stocks and barrels are at boundary	Commission amount	$L=20$ $S=20$ , $B=1$	Input no. of stocks, locks & barrel	178.35 fail
TC-4	locks, stocks and barrels are valid with locks, stocks & barrel at boundary	-	Commission amount	$L=1$ $S=1$ , $B=20$	Input the no. of locks, stocks & barrel	57.50 fail
TC-5	locks, stocks and barrels are valid with locks, stocks & barrel at boundary	-	Commission amount	$L=1$ , $S=20$ , $B=1$	Input the no. of locks, stocks & barrel	67 67

Test case Id	Summary	Pre-condition	Post condition	Execution step	Actual O/P
TC - 6	locks is valid stocks and barrels are at boundary	-	Commission amount	Input L=20 S=1 B=1	\$100
TC - 7	locks, stocks and barrel are at boundary	-	Commission amount	Input L=10 S=10 B=10	10
Robust	lock are invalid, stocks and barrel are valid	-	Commission amount	Input L=0 S=1 B=20	53
TC - 8	locks and barrels are valid, stock is invalid	-	Commission amount	Input no of locks, stocks & barrels	54.5
TC - 9	locks are valid stock is at boundary barrel is invalid	-	Commission amount	L=1 S=0 B=20	54.5
TC - 10	locks are valid stock is at boundary barrel is invalid	-	Commission amount	L=20 S=0 B=1	97.5
					range

POCO

SHOT ON POCO F1

Test case Id	Summary	Pre-condition	Post-condition	Input	Step	O/P	O/P	Q/P.	P
TC - 11	Locks is invalid and stocks is invalid , barrel is at boundary	-	Commission amount	$L = 0$ $S = 0$ $B = 1$	Input no. of locks, stocks & barrels	2.5	2.5	2.5	P
TC - 12	locks and barrel are invalid and stock is at boundary.	-	Commission amount	$L = 0$ $S = 1$ $B = 0$	Input no. of locks, stocks & barrels	3	3	3	P
TC - 13	Locks are at boundary Stocks and barrel are invalid	-	Commission amount	$L = 1$ $S = 0$ $B = 0$	Input no. of locks, stocks & barrels	4.5	4.5	4.5	P
	Locks, stocks and barrel are invalid	-	Commission amount	$L = 0$ $S = 0$ $B = 0$	Input no. of locks, stocks and barrels	0	0	0	P

## CODE

```
#include <stdio.h>
int main() {
    int locks, stocks, barrels, t_sales; flag = 0;
    float comission;
    printf ("Enter the total no. of locks");
    scanf ("%d", &locks);
    if (locks <= 0 || locks > 70) {
        flag = 1;
    }
    printf ("Enter total no. of stocks");
    scanf ("%d", &stocks);
    if (stocks <= 0 || stocks > 80) {
        flag = 1;
    }
    if (flag == 1) {
        printf ("Invalid input \n");
    }
    printf ("Enter no. of barrels");
    scanf ("%d", &barrels);
    if (barrels <= 0 || barrels > 90) {
        flag = 1;
    }
    t_sales = (locks * 45) + (stocks * 30) + (barrels * 25);
    if (t_sales <= 20000) {
        comission = 0.10 * t_sales;
    }
    else if (t_sales < 1800) {
        comission = 0.10 * 1000;
        comission = comission + (0.15 * (t_sales - 1000));
    }
}
```

```
comission = 0.10 * 1000;  
comisiont = {0.15 * 800};  
comission + = {0.20 * (t_sales - 1600)};  
}  
printf ("The total sales is %d The comission is %f ",  
t_sales, comission);  
return 0;  
}
```

Test case ID	Summary	Dependency	Pre-condition	Post-condition	Execution	Input	Expected O/P
TC-1	WEAK ROBUST TEST CASE				Enter value of L, S & B	L = 10 S = 10 B = 10	\$ 100
TC-2	Negative value of locks.				Enter value of L, S & B	L = -1 S = 10 B = 10	\$ 10
TC-3	Negative value of stocks and barrels.				Enter value of L, S & B	L = -1 S = 10 B = 10	-
TC-4	Value of locks not in range				Enter value of L, S & B	L = -1 S = 40 B = 45	Program terminates
TC-5	Value of locks out of range				Enter value of L, S & B	L = -2 S = 40 B = 45	Value of locks not in range in 1...70.
TC-6	Value of stocks not in range				Enter value of L, S & B	L = 35 S = -1 B = 45	Value of stocks not in range 1...60.
TC-7	Value of stocks out of range				Enter value of L, S & B	L = 35 S = 81 B = 45	Value of stocks not in range

Test case	Summary	Dependency	Pre - condition	Post - condition	Execution	Input	Expected O/P
TC-7	Value of barrels not in range.	-	-	-	Enter value of L,S and B	L = 35 S = 40 B = -1	Value of barrels not in range.
TC-8	Value of barrels above the range	-	-	-	Enter value of L,S and B	L = 35 S = 40 B = 41	Value of barrels not in range.
TC-9	Strong Robust	Value of barrels not in range	-	-	Enter value of L,S and B	L = -2 S = 40 B = 45	Value of barrels not in range.
TC-10	Robust	Value of locks not in range	-	-	Enter value of L,S and B	L = 35 S = -1 B = 45	Value of stocks not in range.
TC-11	Value of stocks not in range.	-	-	-	Enter value of L,S and B	L = -2 S = 40 B = -2	Value of stocks not in range.
TC-12	Value of stocks, locks not in range.	-	-	-	Enter value of L,S and B	L = -2 S = -1 B = 45	Value of stocks, locks not in range.

Test case Id	Summary	Dependency	Pre-condition	Post-condition	Execution Input	Expected O/P	Actual O/P.
TC-13	Value of locks and barrels not in range	-	-	-	Enter value of L, S & B	$L = -2$ $S = 40$ $B = -1$	Value of locks and barrels not in range.
TC-14	Value of stocks and barrels not in range	-	-	-	Enter value of L, S & B	$L = 35$ $S = -1$ $B = -1$	Value of locks and barrels not in range.
TC-15	Value of stocks, locks and barrel not in range	-	-	-	Enter value of L, S & B	$L = -2$ $S = -1$ $B = -1$	Value of stocks, locks, barrel not in range.
TC-16	Strong Normal Weak normal locks, stocks and barrels are valid	-	-	-	Enter value of L, S & B	$L = 35$ $S = 40$ $B = 45$	3900 Commission = 640

Decision Table for Commission Problem

Condition	Rules				
	1	2	3	4	5
C1: 1 ≤ locks ≤ 70	F	T	T	T	T
C2: 1 ≤ stocks ≤ 80	I	F	T	T	T
C3: 1 ≤ Barrels ≤ 90	I	I	F	T	T
C4: sales > 1800	I	I	I	T	F
C5: sales > 1000	I	I	I	I	T
C6: sales ≤ 1000	I	I	I	I	I

  

Action					
commission = 0.10 * sales					X
commission2 = commission + 0.15 * (sales - 1000)				X	
commission3 = com2 + 0.20 * (sales - 1800)			X		
commission4 = out of range	X	X	X		T

Test Case ID	Description	Pre-condition	Post-condition	Execution Input	Expected O/P	Actual O/P.
TC-1	Value of locks are invalid	-	-	Enter value of L, S & B L = 91 S = 40 B = 35	Value of locks is out of range	
TC-2	Value of stocks are invalid	-	-	Enter value of L, S & B L = 35 S = -1 B = 45	Stocks is not in range	
TC-3	Value of barrels are invalid	-	-	Enter value of L, S & B L = 35 S = 40 B = 91	Barrels is not in range	
TC-4	Value of locks, stocks and barrels are valid	-	-	Enter value of L, S & B L = 35 S = 40 B = 91	Value of barrels is not in range.	
TC-5	Sales greater than 1000	-	-	Enter value of L, S & B L = 35 S = 50 B = 80	\$680. \$680.	
TC-6	Value of locks, stocks and barrels is less than 1000	-	-	Enter value of L, S & B L = 15 S = 10 B = 10	\$150.25 \$150.25	

Test case Id	Description	Dependency	Pre-condition	Post-condition	Execution	Input	Expected O/P	Actual O/P.
TC-1	Value of locks are invalid	-	-	-	Enter value of L,S & B	L = 91 S = 40 B = 35	Value of locks is out of range.	out of range.
TC-2	Value of stocks are invalid	-	-	-	Enter value of L,S & B	L = 35 S = -1 B = 45	Value of stocks is not in range	not in range
TC-3	Value of barrels are invalid	-	-	-	Enter value of L,S & B	L = 35 S = 40 B = 45	Value of barrels is not in range	not in range
TC-4	Value of locks, stocks and barrels are valid	-	-	-	Enter value of L,S & B	L = 35 S = 40 B = 45	Value of barrels is not in range	not in range
TC-5	Sales greater than 1000	-	-	-	Enter value of L,S & B	L = 35 S = 50 B = 50	\$680.	\$680.
TC-6	Value of locks, stocks and barrels less than 1000	-	-	-	Enter value of L,S & B	L = 10 S = 10 B = 10	\$15625	\$15625
					Enter value of L,S & B	L = 10 S = 10 B = 10	\$100.	\$100.

Aakarshan Bhandwaj

### QUESTION - 3

- Q. Consider an automated banking application. The user can dial the bank from a personal computer, provide a six digit password, and follow with a series of keyword commands that activate the banking function. The software for the application accepts data in following plan:

Area code: Blank or 3 digit number

Prefix: 3 digit no, not beginning with 0 or 1

Suffix: 4 digit number

Password: Six character alphanumeric.

Command : "Check status", "Deposit", "Withdraw"

Design the test case to test the system using boundary value analysis.

Test case Id	Summary	Prec- cond'r	Dependcy cond'r	Post- cond'n	Input	Execution step	Expected O/P
TC-1	Prefix, suffix at boundary	-	-	ASR for password	A = 11 P = 200 S = 0	Input area, prefix, suffix	Enter password
TC-2	Prefix, suffix and area code is valid	-	-	ASR for password	A = 11 P = 201 S = 1	Input area code, prefix, suffix	Enter password
TC-3	Prefix, suffix are at boundary, area code is valid	-	-	ASR for password	A = 434 P = 999 S = 9999	Input area code, prefix, suffix	Enter password
TC-4	Prefix, suffix are valid and boundary-1	-	-	ASR for password	A = 863, P = 998, S = 9998	Input area code, prefix, password	Enter password
TC-5	Prefix, suffix are valid	-	-	ASR for password	A = 473 P = 500 S = 5000	Input area code, prefix, suffix	Enter password

**POCO****Execution Step****Input****Test case Summary****Test case Id**

Robust

TC-6

Area code,  
prefix,  
suffix  
have  
invalid

$A = 0$   
 $P = 199$   
 $S = 989$

Area code  
prefix,  
suffix  
are invalid

Enter  
password.

Input  
area,  
prefix,  
suffix  
have  
minimum  
value

TC-7

Area code  
prefix,  
suffix  
have  
minimum  
value

$A = -$   
 $P = 200$   
 $S = 1111$

Ask  
for  
backward

Input  
area,  
prefix,  
suffix  
have  
minimum  
value

Area code  
prefix,  
suffix  
have  
min+1  
value

Input  
area,  
prefix,  
suffix  
have  
min+1  
value

TC-8

Area code  
prefix,  
suffix  
have  
min+1  
value

$A = 11$   
 $P = 201$   
 $S = 1112$

Ask for  
backward

Input  
area,  
prefix,  
suffix  
have  
min+1  
value

Test case	Summary	Dependency	Pre-condition	Post-condition	Input	Execution O/P	Expected Action O/P
TC-9	Area code prefix, suffix have max	-	Ask for password	A = 999 P = 999 S = 9999	Input area code prefix, suffix	Enter password	
TC-10	Area code is valid prefix and suffix have max-1	-	Ask for password	A = 863 P = 998 S = 9998	Input area code, password		
TC-11	Area code at boundary, prefix, suffix have max +1	-	Ask for password	A = 999 P = 1000 S = 10000	Input area code, password	Enter password	

Input Step	Execution Order	Dependency	Post-condition	Pure-condition	Summary	Test case Id
A = - P = 200 S = 0	Input area code, prefix, suffix	Suffix is invalid	suffix is invalid	-	Area code prefix over at boundary	TC-12
A = 101 P = 201 S = 1	Input area code, prefix, suffix	suffix is invalid	suffix is invalid	-	Area code prefix over minimum +1, suffix is invalid	TC-13
A = 934 P = 999 S = 9999	Input area code, error message.	Ask for password	Ask for password	-	Area code prefix and suffix is valid,	TC-14
A = 865 P = 99B S = 999B	Enter area code, password	Ask for password	Ask for password	-	Area code prefix and suffix have max-1	TC-15

Aakashan Bhandwani

### QUESTION - 4

Q. Next Date is a function of three variable : month, date and year it returns the date of the day after the input date. The month, date and year variable have integers value, subject to following condition :

$$C1 : 1 \leq \text{Month} \leq 12$$

$$C2 : 1 \leq \text{Day} \leq 31$$

$$C3 : 1 \leq \text{Year} \leq 1942$$

Derive test cases by Equivalence class Testing.

TC Id	Summary	Depend -ency	Pre-cond'	Post-cond'	Input	Execution Step	Expected Output	Actual Output.
TC-1	First Normal Date, month, year is valid	-	-	-	Increm. date	15, April 0004	Input Date	16, April 0004
TC-2	Date, month, year is valid	-	-	-	Increm. day	15, April 0003	Input Date	16-April 0003
TC-3	Date, month year is valid and leap year	-	-	-	Increm. day	15, Jan, 0004	Input Date	16-Jan, 0004
TC-4	Date month and year is valid	-	-	-	Increm. day	15, Jan, 1113	Input Date	16-Jan, 1113
Strong Normal.								
TC-5	Date, month and year is valid leap year	-	-	-	Increm. day or Month	16, Feb, 1004	Input Date	17, Feb, 1004
TC-6	Date month and year is valid	-	-	-	Increm.	17, Feb, 1003	Input Date	18, Feb 1003

QUESTION

Aakashan Bhandwani

Test Case ID	Summary	Dependent entity	Pre-cond	Post-cond	Input	Execution Step	Expected O/P	Actual O/P.
TC-7	Date month and year is valid	-	-	increment day	29,April, 1004	Input date	30,April, 1004	Invalid
TC-8	Date, month and year is valid	-	-	increment day	29,April, 1003	Input date	30 April, 1003	Invalid
TC-9	Date, month and year is valid and leap year	-	-	increment day	29,Jan, 1004	Input date	30 Jan, 1004	Invalid
TC-10	Date, month and year is valid and leap year	-	-	increment day	29,Feb, 1004	Input date	01-March 1004	Invalid
TC-11	Date month and year is valid	-	-	increment day	30,April, 1004	Input date	01-May 1004	Invalid

QUESTION - 5<sup>(b)</sup>

Id	Summary	Depend env	Pre-cond	Post-cond	Input	Execution Step	expected O/P	Actual O/P
TC-12	Worst Normal	-	-	-	Reset day and month	30, April, 1003	1, May 1003	Invalid
TC-13	Date, month and year is valid	-	-	-	Input date			
TC-14	Date, month and year is invalid.	-	-	-	Invalid date	29, April, 1003	Invalid	Invalid
TC-15	Date, month is invalid	-	-	-	Input date	31, April, 1003	Invalid	Invalid
TC-16	Strong Normal	-	-	-	Input date	30, April, 0000	Invalid	Invalid
	Date is invalid	-	-	-	Input date	30 Feb, 2004	Valid.	Invalid

Akashan Bhandari  
QUESTION - 5(B)

Id	Summary	Depend ency	Pre-cond	Post-cond	Input	Execution step	Expected O/P	Actual O/P.
TC-17	Date, month and year are invalid	-	-	Invalid	32, 13, 1003	Input date	Invalid	Invalid
TC-18	Date, month and year are invalid	-	-	Invalid	0, November 1943	Input date	Invalid	Invalid
TC-19	Date is valid, month and year is invalid	-	-	Invalid. 0, 13, 1944	Input date	Invalid. Invalid	Invalid	Invalid
TC-20	Date, month and year are invalid	-	-	Invalid. 32, 0, 1945	Input date	Invalid. Invalid	Invalid	Invalid

Akashan Brarwaj  
QUESTION - 5(B)

Q. Next Date is a function of three variables : month, date and year, it returns the date of the day after the input date. The month, date and year variable have integer values, subject to following condition:

$$C_1 : 1 \leq \text{month} \leq 12$$

$$C_2 : 1 \leq \text{day} \leq 31$$

$$C_3 : 1 \leq \text{year} \leq 1942$$

Derive test case by equivalence class testing and derive the decision table.

## "DECISION TABLE"

SHOT ON POCO F1

POCO

Condition	1	2	3	4	5	6	7	Rules	10	11	12	13	14	15	16	17	18
C1: Month with 30 days	T	T	T	T													
C2: Month with 31 days.					T	T	T	T	T	T	T	T	T	T	T	T	T
C3: Month "February" (2)					T				T	T	T	T	T	T	T	T	
C4: 28 Days in month (1 <sup>to</sup> 28)	T				T				T	T	T	T	T	T	T		
C5: 29 Days in month (1 <sup>to</sup> 29)	T	T			T				T	T	T	T	T	T	T		
C6: <del>30</del> Days in month (1 <sup>to</sup> 30)	T	T	T		T				T	T	T	T	T	T	T		
C7: 31 Days in month (1 <sup>to</sup> 31)	T	T	T	T	T				T	T	T	T	T	T	T		
C8: Leap Year (1... 1942)						T			T	T	T	T	T	T	T		
C9: Common Year (1...1942)						T			T	T	T	T	T	T	T		
C10: Month "December" (12)						T			T	T	T	T	T	T	T		
Z Impossible							T		T	T	T	T	T	T	T		
O Increment day								T									
H Increment month									T								
F Increment year										T							
A Reset day											T						
R Reset month.												T					

## Case Summary

case I  
Month with 30 days  
and day between  
1 to 28.

## Dependency Pre-condition

Common or  
Leap year

4 April  
1907

## Post - Input

Enter date.

Error

## TC-2

Month with 30 days  
and 29<sup>th</sup>  
day

30 June  
1902

Error

## TC-3

Month with 30  
days and 29<sup>th</sup>  
day

Common or  
Leap year

29 June  
1902

Enter date

## TC-4

Month with 30  
days and 31<sup>st</sup>  
day

Common or  
Leap year

30 August  
1900

Enter date

1 September  
1900

Error

## TC-5

Month with 30  
days and 31<sup>st</sup>  
day

Common or  
Leap year

31 August  
1902

Enter date

1 September  
1900

Invalid. Error

## TC-6

Month with 31  
days and 29<sup>th</sup>  
day

Common or  
Leap year

28 May  
1906

Enter date

29 May  
1906.

Error

## TC-7

Month with 31  
days and 29<sup>th</sup>  
day

Common or  
Leap year

29 June  
1909

Enter date

30 July  
1909

Error

Proc ID	Short No Prog ID	Execution	Expected Output		
Test Case Id	Summary	Dependency	Pre-condition	Post-condition	Input
TC-7	Month with 31 days and 30 <sup>th</sup> day	-	-	Common or Leap year	30 September 1940
TC-8	Month with 31 days and 30 <sup>th</sup> day	-	-	Common or Leap year	31 December 1940
TC-9	Month February and 28 <sup>th</sup> day and leap year	-	-	Common or Leap year	28 February 4
TC-10	Month February 28 <sup>th</sup> day and common year	-	-	Common or Leap year	28 February 5
TC-11	Month February 29 <sup>th</sup> day and leap year	-	-	Common or Leap year	29 February 12
	Month February 29 <sup>th</sup> day and leap year	-	-	Common or Leap year	30 February 16

Name - Akashan Bhardwaj  
Section - SF

Test case Id	Summary	Dependency	Pre-condition	Post-condition	Input	Execution	Expected O/P
TC-13	Month February 20 day common year	-	-	-	30 February date	Enter invalid.	Error
TC-14	Month February 31 day Leap year	-	-	-	31 February date	Enter invalid.	Error
TC-15	Month February 31 day Common year	-	-	-	24 February date	Enter invalid.	Error
TC-16	Month February 29 day Common year	-	-	-	25 February date	Enter invalid.	Error
TC-17	Month with 31 day, 31st day of year December	-	-	-	30 February date	Enter invalid.	Error
TC-18	Month with 31 day, 31st day of year December	-	-	-	31 December date	Enter invalid.	Error

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## QUESTION-6

- Q. The triangle problem accepts three integers  $a, b$  and  $c$ . These are taken to be sides of a triangle. The output of the program is a type of triangle determined by side of  $D$ . The integers  $a, b$  and  $c$  must satisfy following condition.

$$c_1: 1 \leq a \leq 200$$

$$c_2: 1 \leq b \leq 200$$

$$c_3: 1 \leq c \leq 200$$

$$c_4: a < b + c$$

$$c_5: b < a + c$$

$$c_6: c < a + b$$

If condition given above fail the program should give output as a message value of  $b$  is not in the range of permitted value.

If value  $a, b$  and  $c$  satisfy condition  $c_1, c_2 \& c_3$  one of the four mutually exclusive output are given.

1.  $a = b = c$  equilateral triangle.
2. If exactly one pair is equal  $\Rightarrow$  isosceles triangle.
3. no pair equal  $\Rightarrow$  scalene triangle.
4. If  $c_4, c_5, c_6$  fail  $\Rightarrow$  not a triangle.

Derive the test cases by equivalence class testing, boundary value analysis and decision table.

Test case Id	Summary	Pre-Condition	Post-Condition	Execution	Input	Expected O/P	Actual O/P.
		Dependency of condition cond1					
TC 1	Normal Boundary value.	$b < a+c$ - $c < b+a$	-	Enter value of a,b and c	$a = 1$ $b = 11$ $c = 10$	Scored	Scored
TC 2	minimum value of a	$b < a+c$ - $c < b+a$	-	Enter value of a,b and c	$a = 2$ $b = 11$ $c = 10$	Scored	Scored
TC 3	minimum value of $a+1$	$a < b+c$ - $c < a+b$	-	Enter value of a,b and c	$a = 20$ $b = 1$ $c = 20$	Scored	Scored
TC 4	minimum value of b	$a < b+c$ - $c < a+b$	-	Enter value of a,b and c	$a = 20$ $b = 2$ $c = 19$	Scored	Scored
TC 5	minimum value of $a+b+1$	$a < b+c$ - $b < a+b$	-	Enter value of a,b and c	$a = 30$ $b = 20$ $c = 1$	Scored	Scored

Test case Id	Summary	Pre - Post-condition Condition	Input	Expected O/P	Actual O/P
TC 6	minimum value of $c+1$	$a < b+c$ $b < a+c$	Enter value of $a, b$ and $c$	$a = 60$ $b = 50$ $c = 2$	Scalene Invalid
TC 7	maximum value of $a$	$b < a+c$ $c < b+a$	-	$a = 200$ $b = 180$ $c = 121$	Scalene Invalid
TC 8	maximum value of $a-1$	$b < a+c$ $c < a+b$	-	$a = 199$ $b = 179$ $c = 20$	Scalene Invalid
TC 9	maximum value of $b$	$a < b+c$ $c < a+b$	-	$a = 280$ $b = 200$ $c = 21$	Scalene Invalid
TC 10	maximum value of $b+1$	$a < b+c$ $c < a+b$	-	$a = 179$ $b = 199$ $c = 20$	Scalene Invalid
TC 11	maximum value of $c$	$b < a+c$ $a < b+c$	-	$a = 180$ $b = 40$ $c = 200$	Scalene Invalid
TC 12	maximum value of $c-1$	$a < b+c$ $b < a+c$	-	$a = 179$ $b = 25$ $c = 199$	Scalene Invalid

Test case Id	Summary	Depending Pre - condition condition			Post - condition condition		
		Input	Execution	Expected Output	Actual Output		
TC 13.	Robust boundary value	-	-	$a=0$ $b=10$ $c=1$	Invalid	Invalid	
TC 14.	Value of a less than minimum value of b less than minimum	-	-	$a=9$ $b=0$ $c=12$	Invalid	Invalid	
TC 15.	value of c less than minimum	-	-	$a=2$ $b=150$ $c=0$	Invalid	Invalid	
TC 16.	value of c greater than maximum	-	-	$a=210$ $b=10$ $c=30$	Invalid	Invalid	
TC 17.	Value of b greater than maximum	-	-	$a=10$ $b=220$ $c=20$	Invalid	Invalid	
TC 18	Value of c greater than maximum	-	-	$a=20$ $b=40$ $c=240$	Enter value of a and b	Enter value of a and c	

Summary	Dependency	Pure - Condition	Post - Condition	Expected Output in	Actual Output
Weak Robust	A is invalid	-	Invalid value of A	Input a= 0 b= 3 c= 4	Invalid Invalid
TC - 1	B is invalid	-	Invalid value of B	Input a= 3 b= 201 c= 5	Invalid Invalid
TC - 2	C is invalid	-	Invalid value of C	Input a= 28 b= 102 c= -5	Invalid Invalid
TC - 3	C is invalid	-	display type of triangle	Input a = 101 b = 101 c = 101	Equilateral Invalid
TC - 4	Strong normal	All side are equal	-	-	-
TC - 5	One pair of side are not equal	-	-	Input a = 128 b = 150 c = 25	Scalene. Invalid
TC - 6.	One pair of side are equal	-	-	Input a = 150 b = 150 c = 25	Isosceles. Invalid

Test case Id	Summary	Dependency	Pre-condition	Post-condition	Expected output im	Actual O/P.
weak robust TC - 1	A is invalid	-	-	-	Input . a= 0 b= 3 c= 4	Invalid Invalid
TC - 2	B is invalid	-	-	-	Input a, b and c	Input a= 3 b= 201 c= 5
TC - 3	C is invalid	-	-	-	Input a, b and c	Input a= 26 b= 102 c= -5
Strong normal TC - 4	All side are equilateral	-	-	-	display type of triangle	a = 101 Equilateral Invalid
TC - 5	One pair of side are not equal	-	-	-	display type of triangle	a = 128 Scalene. Invalid
TC - 6.	One pair of side are equal	-	-	-	display type of triangle	Input a = 150 Isosceles AN a, b and c = 25 Input a = 150 Isosceles AN a, b and c = 25

Test case Id	Summary	Dependency Pre-condition			Post-condition		
		a < b	b < c	a < c	a < b	b < c	a < c
7.	A and B are invalid	-	-	-	Enter value a = 0 b = 256 c = 30	Android	Android
8.	A, B and C are valid	-	-	-	Enter value a, b and c a, b and c a, b and c	Android	Android
9.	B and C are invalid	-	-	-	Enter value a = 40 b = 0 c = 275	Android	Android
10.	All are equal	-	-	-	Enter value a = 40 b = 40 c = 40	Android	Android
11.	A and B are equal	-	-	-	Enter value a = 40 b = 40 c = 30	Android	Android
12.	All are unequal	-	-	-	Enter value a = 20 b = 30 c = 40	Android	Android

CONDITION	1	2	3	4	5	6	7
Rule							
$a = b$	T	T	F	F	F	F	T
$b = c$	T	F	F	F	F	F	T
$a = c$	T	T	T	F	F	F	F
$a < b + c$	T	T	T	T	T	F	P
$b < a + c$	T	T	T	T	T	T	F
$c < a + b$	T	T	T	T	T	T	F
ACTION							
Equilateral	X						
Isosceles		X					
Scalene			X		X	X	
Not a triangle				X	X	X	X

Test case Id	Summary	Pre-condition	Execution	Input	Output
TC-1	All condition are valid	$a < b + c$ $b < a + c$ $c < a + b$	Enter value of a, b and c	$a = 50$ $b = 50$ $c = 50$	Calculated Result 500
TC-2	$a = b$	$a = b = c$	Enter value of a, b and c	$a = 60$ $b = 60$ $c = 70$	Result 530
TC-3	$a \neq b \neq c$	$a < b + c$ $b < a + c$ $c < a + b$	Enter value of a, b and c	$a = 50$ $b = 60$ $c = 70$	Scalene Triangle
TC-4	$a + b$ should not be less than c	-	Enter value of a, b and c	$a = 30$ $b = 20$ $c = 50$	Not a Triangle
TC-5	$a + b > c$ & $b + c > a$	-	Enter value of a, b and c	$a = 20$ $b = 50$ $c = 90$	Scalene Triangle
TC-6	$a + c > b$ & $a + b > c$	-	Enter value of a, b and c	$a = 30$ $b = 30$ $c = 30$	Scalene Hump Not a
TC-7	$a = b = c$	-	-	$a = 30$ $b = 30$ $c = 30$	Enter value of a, b and c

Test case Id	Summary	Dependency condition	Pre-condition	Post-condition	Execution	Input	Expected O/P	Actual O/P
TC-1	Valid date month and year	-	-	-	Enter value of date	15/06/2001	16/06/2001	Invalid
TC-2	Valid date month and year	-	-	-	Enter value of date	15/06/1813	16/06/1813	Invalid
TC-3	Valid date month and year	-	-	-	Enter value of date	31/03/1120	01/04/1120	Invalid
TC-4	Valid date month and year	-	-	-	Enter value of date	01/02/1120	02/02/1120	Invalid
TC-5	Valid date month and year	-	-	-	Enter value of date	15/01/1120	16/01/1120	Invalid
TC-6	Valid date month & year	-	-	-	Enter value of date	15/12/1120	16/12/1120	Invalid
TC-7	Valid date month & year	-	-	-	Enter value of date	15/06/1942	16/06/1942	Invalid

Test case Id	Summary	Dependency	Pre-condition	Post-condition	Execution	Input	Expected O/P.	Actual O/P.
TC-8	valid date, month and year	-	-	-	Enter value of date	31/01/1121	01/02/1121	invalid
TC-9	invalid date valid month and year	-	-	-	Enter value of date	00/01/1112	error	invalid
TC-10	invalid month	-	-	-	Enter value of date	03/13/1112	error	invalid
TC-11	invalid month date	-	-	-	Enter value of date	103/00/1112	error	invalid
TC-12	valid date month	-	-	-	Enter value of date	00/00/1112	error	invalid
TC-13	valid date, year, invalid year	-	-	-	Enter value of date	15/01/0000	error	invalid
TC-14	year in	-	-	-	Enter date	15/01/1943	error	invalid