

PES Institute of Technology
Bangalore South Campus

**DEPARTMENT OF INFORMATION SCIENCE &
ENGINEERING**

VI SEMESTER

SOFTWARE TESTING LABORATORY MANUAL

SUBJECT CODE: 15ISL67

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By

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ISE

SOFTWARE TESTING

//Program 1: Decision table approach for solving triangle problem

/* Design and develop a program in a language of your choice to solve the triangle problem defined as follows : Accept three integers which are supposed to be the three sides of triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all. Derive test cases for your program based on decision-table approach, execute the test cases and discuss the results */

```
#include<stdio.h>
int main()
{
    int a,b,c;
    char istriangle;
    printf("enter 3 integers which are sides of triangle\n");
    scanf("%d%d%d",&a,&b,&c);
    printf("a=%d\t,b=%d\t,c=%d",a,b,c);

    // to check is it a triangle or not

    if( a<b+c && b<a+c && c<a+b )
        istriangle='y';
    else
        istriangle='n';
    ;
    if (istriangle=='y')
        if ((a==b) && (b==c))
            printf("equilateral triangle\n");
        else if ((a!=b) && (a!=c) && (b!=c))
            printf("scalene triangle\n");
        else
            printf("isosceles triangle\n");
    else
        printf("Not a triangle\n");
    return 0;
}
```

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Test Case Name :Decision table for triangle problem

Experiment Number : 1

Test Data : Enter the 3 Integer Value(a , b And c)

Pre-condition : $a < b + c$, $b < a + c$ and $c < a + b$

Brief Description : Check whether given value for a equilateral, isosceles , Scalene triangle or can't form a triangle

Input data decision Table

RULES		R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11
Conditions	C1: $a < b + c$	F	T	T	T	T	T	T	T	T	T	T
	C2: $b < a + c$	-	F	T	T	T	T	T	T	T	T	T
	C3: $c < a + b$	-	-	F	T	T	T	T	T	T	T	T
	C4: $a = b$	-	-	-	T	T	T	T	F	F	F	F
	C5: $a = c$	-	-	-	T	T	F	F	T	T	F	F
	C6: $b = c$	-	-	-	T	F	T	F	T	F	T	F
Actions	a1 : Not a triangle	X	X	X								
	a2 : Scalene triangle											X
	a3 : Isosceles triangle							X		X	X	
	a4 : Equilateral triangle				X							
	a5 : Impossible					X	X		X			

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Triangle Problem -Decision Table Test cases for input data

Case Id	Description	Input Data			Expected Output	Actual Output	Status	Comments
		a	b	C				
1	Enter the value of a, b and c Such that a is not less than sum of two sides	20	5	5	Message should be displayed can't form a triangle			
2	Enter the value of a, b and c Such that b is not less than sum of two sides and a is less than sum of other two sides	3	15	11	Message should be displayed can't form a triangle			
3	Enter the value of a, b and c Such that c is not less than sum of two sides and a and b is less than sum of other two sides	4	5	20	Message should be displayed can't form a triangle			
4	Enter the value a, b and c satisfying precondition and $a=b$, $b=c$ and $c=a$	5	5	5	Should display the message Equilateral triangle			
5	Enter the value a ,b and c satisfying precondition and $a=b$ and $b \neq c$	10	10	9	Should display the message Isosceles triangle			
6	Enter the value a, b and c satisfying precondition and $a \neq b$, $b \neq c$ and $c \neq a$	5	6	7	Should display the message Scalene triangle			

Program 1 (Boundary value analysis program)

/* Design and develop a program in a language of your choice to solve the triangle problem defined as follows : Accept three integers which are supposed to be the three sides of triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all. Derive test cases for your program based on boundary value analysis, execute the test cases and discuss the results */

```
#include<stdio.h>
int main()
{
    int a,b,c,c1,c2,c3;
    char istriangle;
    do
    {
        printf("\nenter 3 integers which are sides of triangle\n");
        scanf("%d%d%d",&a,&b,&c);
        printf("\na=%d\tb=%d\tc=%d",a,b,c);
        c1 = a>=1 && a<=10;
        c2= b>=1 && b<=10;
        c3= c>=1 && c<=10;
        if (!c1)
            printf("\nthe value of a=%d is not the range of permitted value",a);
        if (!c2)
            printf("\nthe value of b=%d is not the range of permitted value",b);
        if (!c3)
            printf("\nthe value of c=%d is not the range of permitted value",c);
    } while(!(c1 && c2 && c3));

    // to check is it a triangle or not
    if( a<b+c && b<a+c && c<a+b )
        istriangle='y';
    else
        istriangle='n';
    if (istriangle=='y')
        if ((a==b) && (b==c))
            printf("equilateral triangle\n");
        else if ((a!=b) && (a!=c) && (b!=c))
            printf("scalene triangle\n");
        else
            printf("isosceles triangle\n");
    else
        printf("Not a triangle\n");
    return 0;
}
```

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Test Case Name :Boundary Value Analysis for triangle problem

Experiment Number : 2

Test Data : Enter the 3 Integer Value(a , b And c)

Pre-condition : $1 \leq a \leq 10$, $1 \leq b \leq 10$ and $1 \leq c \leq 10$ and $a < b + c$, $b < a + c$ and $c < a + b$

Brief Description : Check whether given value for a equilateral, isosceles , Scalene triangle or can't form a triangle

Triangle Problem -Boundary value Test cases for input data

Case Id	Description	Input Data			Expected Output	Actual Output	Status	Comments
		A	b	c				
1	Enter the min value for a , b and c	1	1	1	Should display the message Equilateral triangle			
2	Enter the min value for 2 items and min +1 for any one item1	1	1	2	Message should be displayed can't form a triangle			
3	Enter the min value for 2 items and min +1 for any one item1	1	2	1	Message should be displayed can't form a triangle			
4	Enter the min value for 2 items and min +1 for any one item1	2	1	1	Message should be displayed can't form a triangle			
5	Enter the normal value for 2 items and 1 item is min value	5	5	1	Should display the message Isosceles triangle			
6	Enter the normal value for 2 items and 1 item is min value	5	1	5	Should display the message Isosceles triangle			
7	Enter the normal value for 2 items and 1 item is min value	1	5	5	Should display the message Isosceles triangle			
8	Enter the normal Value for a, b and c	5	5	5	Should display the message Equilateral triangle			
9	Enter the normal value for 2 items and 1 item is max value	5	5	10	Should display the message Not a triangle			

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10	Enter the normal value for 2 items and 1 item is max value	5	10	5	Should display the message Not a triangle			
11	Enter the normal value for 2 items and 1 item is max value	10	5	5	Should display the message Not a triangle			
12	Enter the max value for 2 items and max - 1 for any one item	10	10	9	Should display the message Isosceles triangle			
13	Enter the max value for 2 items and max - 1 for any one item	10	9	10	Should display the message Isosceles triangle			
14	Enter the max value for 2 items and max - 1 for any one item	9	10	10	Should display the message Isosceles triangle			
15	Enter the max value for a, b and c	10	10	10	Should display the message Equilateral triangle			

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Program 3 (equivalence class partitioning program)

/* Design and develop a program in a language of your choice to solve the triangle problem defined as follows : Accept three integers which are supposed to be the three sides of triangle and determine if the three values represent an equilateral triangle, isosceles triangle, scalene triangle, or they do not form a triangle at all. Derive test cases for your program based on equivalence class partitioning , execute the test cases and discuss the results */

```
#include<stdio.h>
int main()
{
    int a,b,c , c1,c2,c3;
    char istriangle;
    do
    {
        printf("\nenter 3 integers which are sides of triangle\n");
        scanf("%d%d%d",&a,&b,&c);
        printf("\na=%d\tb=%d\tc=%d",a,b,c);
        c1 = a>=1 && a<=10;
        c2= b>=1 && b<=10;
        c3= c>=1 && c<=10;
        if (!c1)
            printf("\nthe value of a=%d is not the range of permitted value",a);
        if (!c2)
            printf("\nthe value of b=%d is not the range of permitted value",b);
        if (!c3)
            printf("\nthe value of c=%d is not the range of permitted value",c);
    } while(!(c1 && c2 && c3));

    // to check is it a triangle or not
    if( a<b+c && b<a+c && c<a+b )
        istriangle='y';
    else
        istriangle ='n';
    if (istriangle=='y')
        if ((a==b) && (b==c))
            printf("equilateral triangle\n");
        else if ((a!=b) && (a!=c) && (b!=c))
            printf("scalene triangle\n");
        else
            printf("isosceles triangle\n");
    else
        printf("Not a triangle\n");
    return 0;
}
```


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Test Case Name :Equivalence class Analysis for triangle problem

Experiment Number : 3

Test Data : Enter the 3 Integer Value(a , b And c)

Pre-condition : $1 \leq a \leq 10$, $1 \leq b \leq 10$ and $1 \leq c \leq 10$ and $a < b + c$, $b < a + c$ and $c < a + b$

Brief Description : Check whether given value for a equilateral, isosceles , Scalene triangle or can't form a triangle

Triangle Problem -Equivalence Class Test cases for input data

Weak Equivalence class Testing								
Case Id	Description	Input Data			Expected Output	Actual Output	Status	Comments
		a	b	C				
1	Enter the min value for a , b and c	5	5	5	Should display the message Equilateral triangle			
2	Enter the min value for a , b and c	2	2	3	Should display the message Isosceles triangle			
3	Enter the min value for a , b and c	3	4	5	Should display the message Scalene triangle			
4	Enter the min value for a , b and c	4	1	2	Message should be displayed can't form a triangle			

Weak Robust Equivalence class Testing								
5	Enter one invalid input and two valid value for a , b and c	-1	5	5	Should display value of a is not in the range of permitted values			
6	Enter one invalid input and two valid value for a , b and c	5	-1	5	Should display value of a is not in the range of permitted values			
7	Enter one invalid input and two valid value for a , b and c	5	5	-1	Should display value of a is not in the range of permitted values			
8	Enter one invalid input and two valid value for a , b and c	11	5	5	Should display value of a is not in the range of permitted values			
9	Enter one invalid input and two valid value for a , b and c	5	11	5	Should display value of a is not in the range of permitted values			
10	Enter one invalid input and two valid value for a , b and c	5	5	11	Should display value of a is not in the range of permitted values			

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Strong Robust Equivalence class Testing

11	Enter one invalid input and two valid value for a , b and c	-1	5	5	Should display value of a is not in the range of permitted values			
12	Enter one invalid input and two valid value for a , b and c	5	-1	5	Should display value of a is not in the range of permitted values			
13	Enter one invalid input and two valid value for a , b and c	5	5	-1	Should display value of a is not in the range of permitted values			
14	Enter two invalid input and two valid value for a , b and c	-1	-1	5	Should display value of a is not in the range of permitted values			
					Should display value of b is not in the range of permitted values			
14	Enter two invalid input and two valid value for a , b and c	5	-1	-1	Should display value of b is not in the range of permitted values			
					Should display value of c is not in the range of permitted values			
14	Enter two invalid input and two valid value for a , b and c	-1	5	-1	Should display value of a is not in the range of permitted values			
					Should display value of c is not in the range of permitted values			
15	Enter all invalid inputs	-1	-1	-1	Should display value of a is not in the range of permitted values			
					Should display value of b is not in the range of permitted values			
					Should display value of c is not in the range of permitted values			

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```
1 //Program 4: (Dataflow Testing for commission calculation)
2 #include<stdio.h>
3 int main()
4 {
5     int locks, stocks, barrels, tlocks, tstocks, tbarrels;
6     float lprice,sprice,bprice,lsales,ssales,bsales,sales,comm;
7     lprice=45.0;
8     sprice=30.0;
9     bprice=25.0;
10    tlocks=0;
11    tstocks=0;
12    tbarrels=0;
13    printf("\nenter the number of locks and to exit the loop enter -1 for locks\n");
14    scanf("%d", &locks);
15    while(locks!=-1) {
16        printf("enter the number of stocks and barrels\n");
17        scanf("%d%d",&stocks,&barrels);
18        tlocks=tlocks+locks;
19        tstocks=tstocks+stocks;
20        tbarrels=tbarrels+barrels;
21        printf("\nenter the number of locks and to exit the loop enter -1 for locks\n");
22        scanf("%d",&locks);
23    }
24    printf("\ntotal locks = %d\n",tlocks);
25    printf("total stocks =%d\n",tstocks);
26    printf("total barrels =%d\n",tbarrels);
27
28    lsales = lprice*tlocks;
29    ssales=sprice*tstocks;
30    bsales=bprice*tbarrels;
31    sales=lsales+ssales+bsales;
32    printf("\nthe total sales=%f\n",sales);
33    if(sales > 1800.0)
34    {
35        comm=0.10*1000.0;
36        comm=comm+0.15*800;
37        comm=comm+0.20*(sales-1800.0);
38    }
39    else if(sales > 1000)
40    {
41        comm =0.10*1000;
42        comm=comm+0.15*(sales-1000);
43    }
44    else
45        comm=0.10*sales;
46    printf("the commission is=%f\n",comm);
47    return 0;
48 }
```

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Test Case Name : Data Flow Testing for Commission Program

Experiment No : 4

Precondition : Enter -1 for locks to exit from input loop

Brief Description : Enter the locks, stocks and barrels > 0

Define /Use nodes for variables in the commission problem

Variable name	Defined at node	Used at Node
lprice	7	24
sprice	8	25
bprice	9	26
tlocks	10,16	16,21,24
tstocks	11,17	17,22,25
tbarrels	12,18	18,23,26
locks	13,19	14,16
stocks	15	17
barrels	15	18
lsales	24	27
ssales	25	27
bsales	26	27
sales	27	28,29,33,34,37,39
comm	31,32,33,36,37,39	32,33,37,42

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Selected Define/Use Paths for Commission problem

Test case id	Description	variables path(Beginning, End nodes)	Du paths	Definition clear ?	Comments
1	Check for lock price variable DEF(lprice,7) and USE(lprice,24)	(7 , 24)	<7-8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24>	Yes	
2	Check for Stock price variable DEF(sprice,8) and USE(sprice,25)	(8 , 25)	<8-9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25>	Yes	
3	Check for barrel price variable DEF(bprice,9) and USE(bprice,26)	(9 , 26)	<9-10-11-12-13-14-15-16-17-18-19-20-21-22-23-24-25-26>	Yes	
4	Check for total locks variable DEF((tlocks,10) and DEF(tlocks,16)) and 3 usage node(USE(tlocks,16),USE(tlocks,21),USE(tlocks,24)	(10 , 16)	<10-11-12-13-14-15-16>	Yes	
		(10 , 21)	<10-11-12-13-14-15-16-17-18-19-20-14-21>	No	
		(10 , 24)	<10-11-12-13-14-15-16-17-18-19-20-14-21-22-23-24>	No	
		(16 , 16)	<16-16>	Yes	
		(16 , 21)	<16-17-18-19-14-21>	No	
		(16 , 24)	<16-17-18-19-20-14-21-22-23-24>	No	
5	Check for total stocks variable DEF((tstocks,11) and DEF(tstocks,17)) and 3 usage node(USE(tstocks,17),USE(tstocks,22),USE(tstocks,25)	(11 , 17)	<11-12-13-14-15-16-17>	Yes	
		(11 , 22)	<11-12-13-14-15-16-17-18-19-20-21-14-21>	No	
		(11 , 25)	<11-12-13-14-15-16-17-18-19-20-21-14-21-23-24-25>	No	
		(17 , 17)	<17-17>	Yes	
		(17 , 22)	<17-18-19-20-14-21-22>	No	
		(17 , 25)	<17-18-19-20-14-21-22-23-24-25>	No	

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6	check for locks variable (DEF(locks,13) ,DEF(locks,19) and USE(locks,14),USE(locks,16)	(13 , 14)	<13-14>	Yes	Begin the loop
		(13 , 16)	<13-14-15-16>	Yes	
		(19 , 14)	<19-20-14>	Yes	
		(19 , 16)	<19-20-14-15-16>	Yes	Repeat the loop
7	Check for stocks variable (DEF(stocks,15) and USE(stocks,17)	(15 , 17)	<15-16-17>	Yes	
8	Check for sales DEF(sales, 27) and USE(Sales, 28), USE(Sales , 29), USE(Sales,33) , USE(Sales , 34) , USE(Sales,37) , USE(Sales , 39)	(27 , 28)	<27-28>	Yes	
		(27 , 29)	<27-28-29>	Yes	
		(27 , 33)	<27-28-29-30-31-32-33>	Yes	
		(27 , 34)	<27-28-29-34>	Yes	
		(27 , 37)	<27-28-29-34-35-36-37>	Yes	
		(27 , 39)	<27-28-29-34-38-39>	Yes	
9	Check for Commission variable DEF(comm, 31,32,33) , DEF(comm,34,35) and DEF(comm,39) and USE(comm,42)	((31,32,33),42)	<31-32-33-42>	Yes	
		((34 , 35) , 42)	<34-35-42>	Yes	
		((39 , 42)	<39 - 42>	Yes	

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//Program 5, 6 and 7 (Boundary , Equivalence and Decision Test Case for Commission Problem)

/* Design. develop, code and run the program in any suitable language to solve the commission problem. Analyze it from the perspective of boundary value, derive test cases, execute these test cases and discuss the test results */

/* Assumption price for lock=45.0, stock=30.0 and barrels=25.0 production limit could sell in a month 70 locks,80 stocks and 90 barrels commission on sales = 10 % <= 1000 and 15 % on 1000 to 1800 and 20 % on above 1800*/

```
#include<stdio.h>
int main()
{
    int locks, stocks, barrels, tlocks, tstocks, tbarrels;
    float lprice, sprice, bprice, sales, comm;
    int c1,c2,c3,temp;
    lprice=45.0;
    sprice=30.0;
    bprice=25.0;
    tlocks=0;
    tstocks=0;
    tbarrels=0;
    printf("\nenter the number of locks and to exit the loop enter -1 for locks\n");
    scanf("%d",&locks);
    while(locks!=-1)
    {
        c1=(locks<=0||locks>70);
        printf("enter the number of stocks and barrels\n");
        scanf("%d%d",&stocks,&barrels);
        c2=(stocks<=0||stocks>80);
        c3=(barrels<=0||barrels>90);
        if(c1)
            printf("value of locks not in the range 1..70 ");
        else
        {
            temp=tlocks+locks;
            if(temp>70)
                printf("new total locks =%d not in the range 1..70 so old ",temp);
            else
                tlocks=temp;
        }
        printf("total locks = %d\n",tlocks);

        if(c2)
            printf("value of stocks not in the range 1..80 ");
        else
        {
            temp=tstocks+stocks;
            if(temp>80)
```

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```
        printf("new total stocks =%d not in the range 1..80 so old ",temp);
        else
            tstocks=temp;
    }
    printf("total stocks=%d\n",tstocks);

    if(c3)
        printf("value of barrels not in the range 1..90 ");
    else
    {
        temp=tbarrels+barrels;
        if(temp>90)
            printf("new total barrels =%d not in the range 1..90 so old ",temp);
        else
            tbarrels=temp;
    }
    printf("total barrel=%d",tbarrels);
    printf("\nenter the number of locks and to exit the loop enter -1 for locks\n");
    scanf("%d",&locks);
}
printf("\ntotal locks = %d\ntotal stocks =%d\ntotal barrels =%d\n",tlocks,tstocks,tbarrels);
sales = lprice*tlocks+sprice*tstocks+bprice*tbarrels;
printf("\nthe total sales=%f\n",sales);

if(sales > 0)
{
    if(sales > 1800.0)
    {
        comm=0.10*1000.0;
        comm=comm+0.15*800;
        comm=comm+0.20*(sales-1800.0);
    }
    else if(sales > 1000)
    {
        comm =0.10*1000;
        comm=comm+0.15*(sales-1000);
    }
    else
        comm=0.10*sales;

    printf("the commission is=%f\n",comm);
}
else
    printf("there is no sales\n");
return 0;
}
```


Test Case Name : Boundary Value for Commission Problem

Experiment Number : 5

Test data : price Rs for lock - 45.0 , stock - 30.0 and barrel - 25.0

sales = total lock * lock price + total stock * stock price + total barrel * barrel price

commission : 10% up to sales Rs 1000 , 15 % of the next Rs 800 and 20 % on any sales in excess of 1800

Pre-condition : lock = -1 to exit and $1 \leq \text{lock} \leq 70$, $1 \leq \text{stock} \leq 80$ and $1 \leq \text{barrel} \leq 90$

Brief Description: The salesperson had to sell at least one complete rifle per month.

Checking boundary value for locks, stocks and barrels and commission

Commission Problem Output Boundary Value Analysis Cases

Case Id	Description	Input Data			Expected Output		Actual output		Status	Comment
		Total Locks	Total Stocks	Total Barrels	Sales	Commission	Sales	Commission		
1	Enter the min value for locks, stocks and barrels	1	1	1	100	10				output minimum
2	Enter the min value for 2 items and min +1 for any one item	1	1	2	125	12.5				output minimum +
3		1	2	1	130	13				output minimum +
4		2	1	1	145	14.5				output minimum +
5	Enter the value sales approximately mid value between 100 to 1000	5	5	5	500	50				Midpoint
6	Enter the values to calculate the commission for sales nearly less than 1000	10	10	9	975	97.5				Border point -
7		10	9	10	970	97				Border point -
8		9	10	10	955	95.5				Border point -
9	Enter the values sales exactly equal to 1000	10	10	10	1000	100				Border point
10	Enter the values to calculate the commission for sales nearly greater than 1000	10	10	11	1025	103.75				Border point +
11		10	11	10	1030	104.5				Border point +
12		11	10	10	1045	106.75				Border point +
13	Enter the value sales approximately mid value	14	14	14	1400	160				Midpoint

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	between 1000 to 1800								
14	Enter the values to calculate the commission for sales nearly less than 1800	18	18	17	1775	216.25			Border point -
15		18	17	18	1770	215.5			Border point -
16		17	18	18	1755	213.25			Border point -
17	Enter the values sales exactly equal to 1800	18	18	18	1800	220			Border point
18	Enter the values to calculate the commission for sales nearly greater than 1800	18	18	19	1825	225			Border point +
19		18	19	18	1830	226			Border point +
20		19	18	18	1845	229			Border point +
21	Enter the values normal value for lock, stock and barrel	48	48	48	4800	820			Midpoint
22	Enter the max value for 2 items and max - 1 for any one item	70	80	89	7775	1415			Output maximum -
23		70	79	90	7770	1414			Output maximum -
24		69	80	90	7755	1411			Output maximum -
25	Enter the max value for locks,stocks and barrels	70	80	90	7800	1420			Output maximum

Output Special Value Test Cases

Case Id	Description	Input Data			Expected Output		Actual output		Status	Comment
		Total Locks	Total Stocks	Total Barrels	Sales	Commission	Sales	Commission		
1	Enter the random values such that to calculate commission for sales nearly less than 1000	11	10	8	995	99.5				Border point -
2	Enter the random values such that to calculate commission for sales nearly greater than 1000	10	11	9	1005	100.75				Border point +
3	Enter the random values such that to calculate commission for sales nearly less than 1800	18	17	19	1795	219.25				Border point -

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4	Enter the random values such that to calculate commission for sales nearly greater than 1800	18	19	17	1805	221				Border point +
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Test Case Name :Equivalence Class for Commission Problem

Experiment Number : 6

Test data : price Rs for lock - 45.0 , stock - 30.0 and barrel - 25.0

sales = total lock * lock price + total stock * stock price + total barrel * barrel price

commission : 10% Upto sales Rs 1000 , 15 % of the next Rs 800 and 20 % on any sales in excess of 1800

Pre-condition : lock = -1 to exit and $1 \leq \text{lock} \leq 70$, $1 \leq \text{stock} \leq 80$ and $1 \leq \text{barrel} \leq 90$

Brief Description: The salesperson had to sell at least one complete rifle per month.

Checking boundary value for locks,stocks and barrels and commission

Valid Classes

L1 = {LOCKS : $1 \leq \text{LOCKS} \leq 70$ }

L2 = {Locks=-1} (occurs if locks=-1 is used to control input iteration)

L3 = {stocks : $1 \leq \text{stocks} \leq 80$ }

L4 = {barrels : $1 \leq \text{barrels} \leq 90$ }

Invalid Classes

L3 = {locks: locks=0 OR locks<-1}

L4 = {locks: locks> 70}

S2 = {stocks : stocks<1}

S3 = {stocks : stocks >80}

B2 = {barrels : barrels <1}

B3 = barrels : barrels >90}

Commission Problem Output Equivalence Class Testing

(Weak & Strong Normal Equivalence Class)

Case Id	Description	Input Data			Expected Output		Actual output		Status	Comment
		Total Locks	Total Stocks	Total Barrels	Sales	Commission	Sales	Commission		
1	Enter the value within the range for locks,stocks and barrels	35	40	45	3900	640				

SOFTWARE TESTING

Weak Robustness equivalence Class

Case Id	Description	Input Data			Expected Output	Actual output	Status	Comment
		Locks	Stocks	Barrels				
WR1	Enter the value locks = -1	-1	40	45	Terminates the input loop and proceed to calculate sales and commission (if Sales > 0)			
WR2	Enter the value less than -1 or equal to zero for locks and other valid inputs	0	40	45	Value of Locks not in the range 1..70			
WR3	Enter the value greater than 70 for locks and other valid inputs	71	40	45	Value of Locks not in the range 1..70			
WR4	Enter the value less than or equal than 0 for stocks and other valid inputs	35	0	45	Value of stocks not in the range 1..80			
WR5	Enter the value greater than 80 for stocks and other valid inputs	35	81	45	Value of stocks not in the range 1..80			
WR6	Enter the value less than or equal 0 for barrels and other valid inputs	35	40	0	Value of Barrels not in the range 1..90			
WR7	Enter the value greater than 90 for barrels and other valid inputs	35	40	91	Value of Barrels not in the range 1..90			

Strong Robustness equivalence Class

Case Id	Description	Input Data			Expected Output	Actual output	Status	Comment
		Locks	Stocks	Barrels				
SR1	Enter the value less than -1 for locks and other valid inputs	-2	40	45	Value of Locks not in the range 1..70			
SR2	Enter the value less than or equal than 0 for stocks and other valid inputs	35	-1	45	Value of stocks not in the range 1..80			
SR3	Enter the value less than or equal 0 for barrels and other valid inputs	35	40	-2	Value of Barrels not in the range 1..90			
SR4	Enter the locks and stocks less than or equal to 0 and other valid inputs	-2	-1	45	Value of Locks not in the range 1..70			
					Value of stocks not in the range 1..80			
SR5	Enter the locks and barrel less than or equal to 0 and other valid inputs	-2	40	-1	Value of Locks not in the range 1..70			
					Value of Barrels not in the range 1..90			

SOFTWARE TESTING

SR6	Enter the stocks and barrel less than or equal to 0 and other valid inputs	35	-1	-1	Value of stocks not in the range 1..80			
					Value of Barrels not in the range 1..90			
SR7	Enter the stocks and barrel less than or equal to 0 and other valid inputs	-2	-2	-2	Value of Locks not in the range 1..70			
					Value of stocks not in the range 1..80			
					Value of Barrels not in the range 1..90			

Some addition equivalence Boundary checking

Case Id	Description	Input Data			Expected Output		Actual output		Stat us	Comment
		Total Locks	Total Stocks	Total Barrels	Sales	Commission	Sale s	Commiss ion		
OR1	Enter the value for lock, stocks and barrels where $0 < \text{Sales} < 1000$	5	5	5	500	50				
OR2	Enter the value for lock, stocks and barrels where $1000 < \text{Sales} < 1800$	15	15	15	1500	175				
OR3	Enter the value for lock, stocks and barrels where $\text{Sales} < 1800$	25	25	25	2500	360				

SOFTWARE TESTING

Test Case Name :Decision Table for Commission Problem

Experiment Number : 7

Test data : price Rs for lock - 45.0 , stock - 30.0 and barrel - 25.0

sales = total lock * lock price + total stock * stock price + total barrel * barrel price

commission : 10% Upto sales Rs 1000 , 15 % of the next Rs 800 and 20 % on any sales in excess of 1800

Pre-condition : lock = -1 to exit and $1 \leq \text{lock} \leq 70$, $1 \leq \text{stock} \leq 80$ and $1 \leq \text{barrel} \leq 90$

Brief Description: The salesperson had to sell at least one complete rifle per month.

Input data decision Table

RULES		R1	R2	R3	R4	R5	R6	R7	R8	R10
Conditions	C1: Locks = -1	T	F	F	F	F	F	F	F	F
	C2 : $1 \leq \text{Locks} \leq 70$	-	T	T	F	T	F	F	F	T
	C3 : $1 \leq \text{Stocks} \leq 80$	-	T	F	T	F	T	F	F	T
	C4 : $1 \leq \text{Barrels} \leq 90$	-	F	T	T	F	F	T	F	T
Actions	a1 : Terminate the input loop	X								
	a2 : Invalid locks input				X		X	X	X	
	a3 : Invalid stocks input			X		X		X	X	
	a4 : Invalid barrels input		X			X	X		X	
	a5 : Calculate total locks,stocks and barrels		X	X	X	X	X	X		X
	a5 : Calculate Sales	X								
	a6: proceed to commission decision table	X								

Commission calculation Decision Table

Precondition : lock = -1

RULES		R1	R2	R3	R4
Condition	C1 : Sales = 0	T	F	F	F
	C1 : Sales > 0 AND Sales ≤ 1000		T	F	F
	C2 : Sales > 1001 AND sales ≤ 1800			T	F
	C3 : sales ≥ 1801				T
Actions	A1 : Terminate the program	X			
	A2 : comm= 10%*sales		X		
	A3 : comm = 10%*1000 + (sales-1000)*15%			X	
	A4 : comm = 10%*1000 + 15% * 800 + (sales-1800)*20%				X

SOFTWARE TESTING

Precondition : Initial Value Total Locks= 0 , Total Stocks=0 and Total Barrels=0

Precondition Limit :Total locks, stocks and barrels should not exceed the limit 70,80 and 90 respectively

Commission Problem -Decision Table Test cases for input data

Case Id	Description	Input Data			Expected Output	Actual Output	Status	Comments
		Locks	Stocks	Barrels				
1	Enter the value of Locks= -1	-1			Terminate the input loop check for sales if(sales=0) exit from program else calculate commission			
2	Enter the valid input for lock and stack and invalid for barrels	20	30	-5	Total of locks,stocks is updated if it is with in a precondition limit and Should display value of barrels is not in the range 1..90			
3	Enter the valid input for lock and barrels and invalid for stocks	15	-2	45	Total of locks, barrels is updated if it is with in a precondition limit and Should display value of barrels is not in the range 1..80			
4	Enter the valid input for lock and barrels and invalid for stocks	-4	15	16	Total of stocks , barrels is updated if it is with in a precondition limit and Should display value of barrels is not in the range 1..70			
5	Enter the valid input for lock and invalid value for stocks and barrels	15	80	100	Total of locks is updated if it is with in a precondition limit and (i)Should display value of stock is not in the range 1..80 (ii)Should display value of barrels is not in the range 1..90			
6	Enter the valid input for stocks and invalid value for locks and barrels	88	20	99	Total of stocks is updated if it is with in a precondition limit and (i)Should display value of lock is not in the range 1..70 (ii)Should display value of barrels is not in the range 1..90			
7	Enter the valid input for barrels and invalid value for locks and stocks	100	20 0	25	Total of barrels is updated if it is with in a precondition limit and (i)Should display value of lock is not in the range 1..70 (ii)Should display value of stocks is not in the range 1..80			
8	Enter the invalid input for lock , stocks and barrels	-5	40 0	-9	(i)Should display value of lock is not in the range 1..70 (ii)Should display value of stocks is not in the range 1..80 (iii)Should display value of barrel in not in the range 1..90			

SOFTWARE TESTING

9	Enter the valid input for lock, stocks and barrels	15	20	25	Total of locks,stocks and barrels is updated if it is with in a precondition limit and calculate the sales and proceed to commission			
---	--	----	----	----	--	--	--	--

Commission Problem -Decision Table Test cases for commission calculation

Precondition : Locks = -1

Case Id	Description	Input Data	Expected Output		Actual Output	Status	Comments
		Sales	Commission	Values			
1	Check the value of sales	0	Terminate the program where commission is zero	0			
2	if sales value with in these range(Sales > 0 AND Sales ≤ 1000)	900	Then commission = 0.10*sales = 90	900			
3	if sales value with in these range(Sales > 1000 AND Sales ≤ 1800)	1400	Then commission = 0.10*1000 + 0.15*(sales - 1000)	1600			
4	if sales value with in these range(Sales > 1800	2500	Then commission = 0.10*1000 + 0.15*800 + 0.20 *(sales - 1800)	3400			

SOFTWARE TESTING

Program 8(Binary Search - Path Testing)

/* Design, develop a code and run the program in any suitable language to implement the binary search algorithm. Determine the basis paths and using them derive different test cases execute these test cases and discuss the test results */

```
#include<stdio.h>
int binsrc(int x[],int low,int high,int key)
{
    int mid;
    while(low<=high)
    {
        mid=(low+high)/2;
        if(x[mid]==key)
            return mid;
        if(x[mid]<key)
            low=mid+1;
        else
            high=mid-1;
    }
    return -1;
}

int main()
{
    int a[20],key,i,n,succ;
    printf("Enter the n value");
    scanf("%d",&n);
    if(n>0)
    {
        printf("enter the elements in ascending order\n");
        for(i=0;i<n;i++)
            scanf("%d",&a[i]);

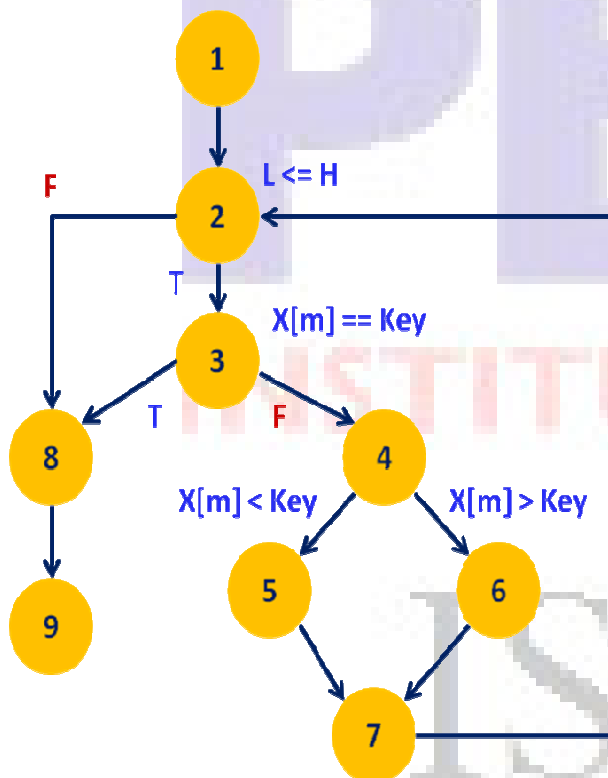
        printf("enter the key element to be searched\n");
        scanf("%d",&key);
        succ=binsrc(a,0,n-1,key);
        if(succ>=0)
            printf("Element found in position = %d\n",succ+1);
        else
            printf("Element not found \n");
    }
    else
        printf("Number of element should be greater than zero\n");
    return 0;
}
```

Binary Search function with line number

```
int binsrc(int x[],int low, int high, int key)
{
    int mid;
    while(low<=high)
    {
        mid=(low+high)/2;
        if(x[mid]==key)
            return mid;
        if(x[mid]<key)
            low=mid+1;
        else
            high=mid-1;
    }
    return -1;
}
```

1
2
3
8
4
5
6
7
8
9

Program Graph – for Binary Search



Independent Paths:

#Edges=11, #Nodes=9, #P=1

$$V(G) = E - N + 2P = 11 - 9 + 2 = 4$$

P1: 1-2-3-8-9

P2: 1-2-3-4-5-7-2

P3: 1-2-3-4-6-7-2

P4: 1-2-8-9

SOFTWARE TESTING

Pre-Conditions/Issues:

Array has Elements in **Ascending order** **T/F**

Key element is in the Array **T/F**

Array has **ODD** number of Elements **T/F**

Test Cases – Binary Search

Paths	Inputs		Expected Output	Remarks
	X[]	Key		
P1: 1-2-3-8-9	{10,20,30,40,50}	30	Success	Key \in X[] and Key==X[mid]
P2: 1-2-3-4-5-7-2	{10,20,30,40,50}	20	Repeat and Success	Key < X[mid] Search 1 st Half
P3: 1-2-3-4-6-7-2	{10,20,30,40,50}	40	Repeat and Success	Key > X[mid] Search 2 nd Half
P4: 1-2-8-9	{10,20,30,40,50}	60 OR 05	Repeat and Failure	Key \notin X[]
P4: 1-2-8-9	Empty	Any Key	Failure	Empty List

INSTITUTIONS

ISE

Program 9(Quick Sort-Path Testing)

/*Design, develop ,code and run the program in any suitable language to implement the quicksort algorithm. Determine the basis paths and using them derive different test cases, execute these test cases and discuss the test results.*/

```
#include<stdio.h>
void quicksort(int x[10],int first,int last)
{
    int temp,pivot,i,j;
    if(first<last)
    {
        pivot=first;
        i=first;
        j=last;
        while(i<j)
        {
            while(x[i]<=x[pivot] && i<last)
                i++;
            while(x[j]>=x[pivot])
                j--;
            if(i<j)
            {
                temp=x[i];
                x[i]=x[j];
                x[j]=temp;
            }
        }
        temp=x[pivot];
        x[pivot]=x[j];
        x[j]=temp;
        quicksort(x,first,j-1);
        quicksort(x,j+1,last);
    }
}
```

// main program

```
int main()
{
    int a[20],i,key,n;
    printf("enter the size of the array");
    scanf("%d",&n);
    if(n>0)
    {
        printf("enter the elements of the array");
        for(i=0;i<n;i++)
            scanf("%d",&a[i]);
    }
}
```

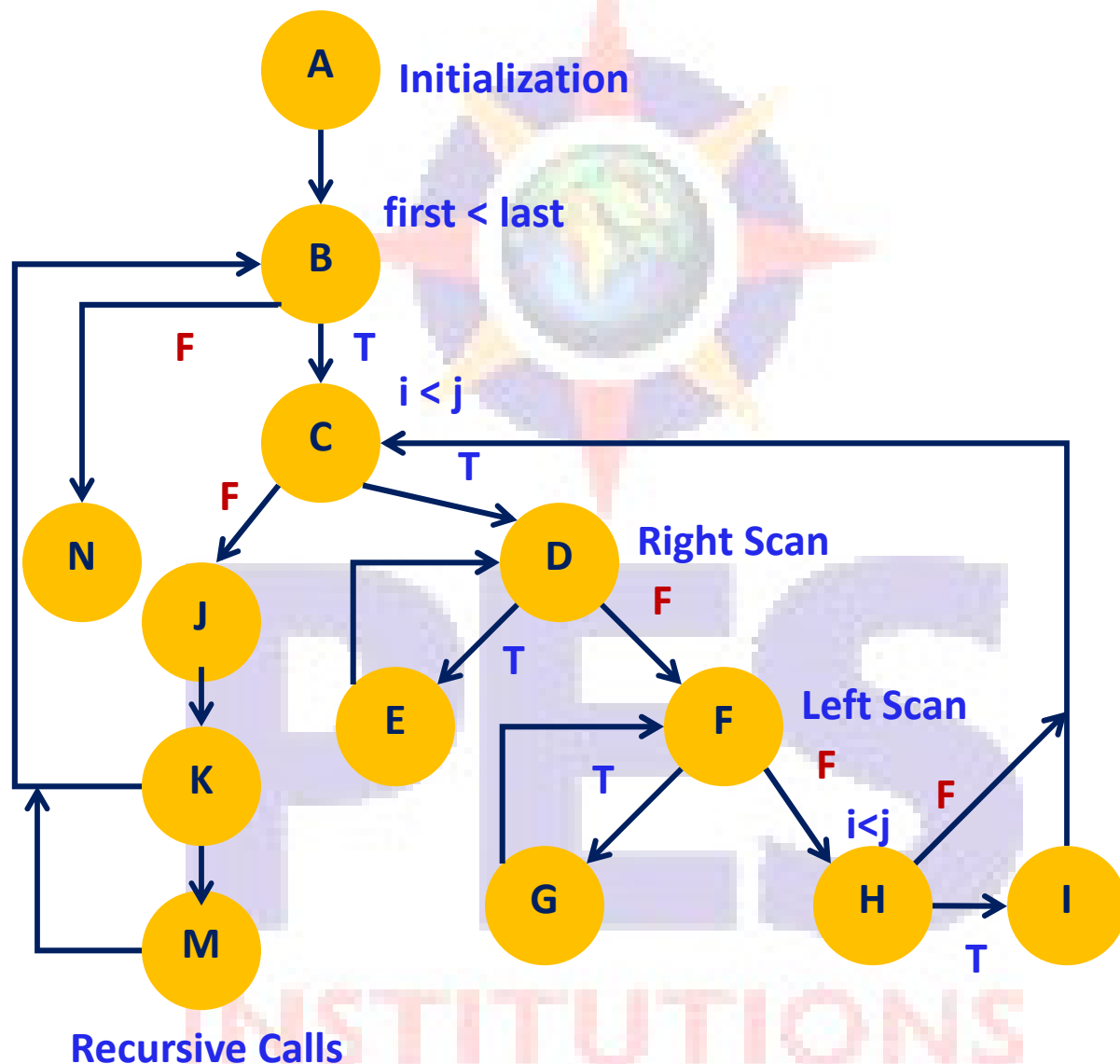
SOFTWARE TESTING

```
        quicksort(a,0,n-1);
        printf("the elements in the sorted array is:\n");
        for(i=0;i<n;i++)
            printf("%d\t",a[i]);
    }
    else
    {
        printf("size of array is invalid\n");
    }
}
```

Quick sort function with line number

```
void quicksort(int x[10],int first,int last)
{
    int temp,pivot,i,j;                                1
    if(first<last)                                     2
    {
        pivot=first;                                    3
        i=first+1;                                      4
        j=last;                                         5
        while(i<j)                                       6
        {
            while(x[i]<=x[pivot] && i<last)              7
                i++;                                    8
            while(x[j]>=x[pivot])                        9
                j--;                                    10
            if(i<j)                                      11
            {
                temp=x[i];                               12
                x[i]=x[j];                               13
                x[j]=temp;                               14
            }
        }
        temp=x[pivot];                                  15
        x[pivot]=x[j];                                  16
        x[j]=temp;                                       17
        quicksort(x,first,j-1);                         18
        quicksort(x,j+1,last);                         19
    }
}                                                        20
```

Program Graph – Quick Sort



Independent Paths– Quick Sort

P1: A-B-N

P2: A-B-C-J-K-B

P3: A-B-C-J-K-M-B

P4: A-B-C-D-F-H-C

P5: A-B-C-D-F-H-I-C

P6: A-B-C-D-E-D-F-H

P7: A-B-C-D-F-G-F-H

Pre-Conditions/Issues:

Array has only one Element, Two Elements, Three Elements (6 Possibilities)

Array has Elements in ASC/DSC/Arbitrary(Any of the Permutations)

SOFTWARE TESTING

EX: 3 elements: 123, 132, 213, 231, 312, 321, + 222,111,333

Test Cases – Quick Sort

Paths	Inputs		Expected Output	Remarks
	X[]	First, Last		
P1: A-B-N	5	1,1	Sorted	Only one Elem
P2: A-B-C-J-K-B	5,4	1,2	Repeat & Sorted	Two Elements
P3: A-B-C-J-K-M-B	1,2,3 OR 3,1,2	1,3	Repeat & Sorted	Three Elements
P4: A-B-C-D-F-H-C	1,2,3,4,5	1,5	Repeat & Sorted	ASC Sequence
P5: A-B-C-D-F-H-I-C	5,4,3,2,1	1,5	Repeat & Sorted	DSC Sequence
P6: A-B-C-D-E-D-F-H	1,4,3,2,5 OR 2,2,2,2,2	1,5	Repeat & Sorted	Pivot is MIN
P7: A-B-C-D-F-G-F-H	5,2,3,1,4	1,5	Repeat & Sorted	Pivot is MAX



SOFTWARE TESTING

Program 10 (Absolute Letter Grading Path Testing)

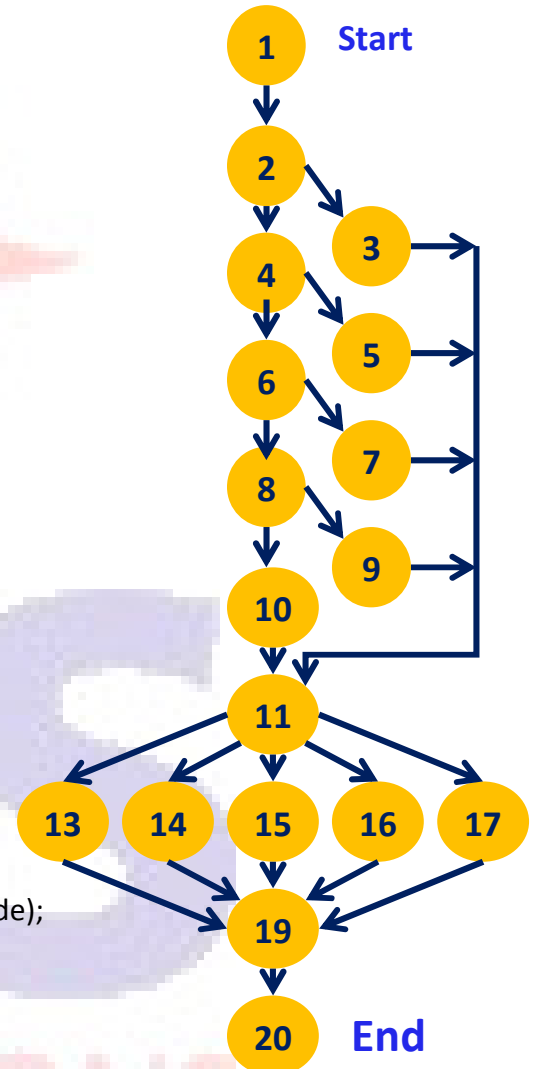
/* Design, develop, code and run the program in any suitable language to implement an absolute letter grading procedure, making suitable assumptions. Determine the basis paths and using them derive different test cases, execute these test cases and discuss the test results */

```
#include<stdio.h>
int main()
{
    float per;
    char grade;
    scanf("%f",&per);
    if(per>=90)
        grade= 'A';
    else if(per>=80 && per<90)
        grade ='B';
    else if(per>=70 && per<80)
        grade ='C';
    else if(per>=60 && per<70)
        grade='D';
    else grade='E';
    switch(grade)
    {
        case 'A': printf("\nEXCELLENT"); break;
        case 'B':printf("\nVery Good"); break;
        case 'C' : printf("\nGood"); break;
        case 'D': printf("\nAbove Average"); break;
        case 'E': printf("\n Satisfactory"); break;
    }
    printf("\t The percentage = %f and grade is %c ",per,grade);
    return 0;
}
```

SOFTWARE TESTING

Absolute Grading Program with Line Numbers and Program Graph

```
int main()
{
    float per;
    char grade;
    1.    scanf("%f",&per);
    2.    if(per>=90)
    3.        grade= 'A';
    4.    else if(per>=80 && per<90)
    5.        grade = 'B';
    6.    else if(per>=70 && per<80)
    7.        grade = 'C';
    8.    else if(per>=60 && per<70)
    9.        grade='D';
    10.   else grade='E';
    11.   switch(grade)
    12.   {
    13.       case 'A': printf("\nEXCELLENT"); break;
    14.       case 'B': printf("\nVery Good"); break;
    15.       case 'C' : printf("\nGood"); break;
    16.       case 'D': printf("\nAbove Average"); break;
    17.       case 'E': printf("\n Satisfactory"); break;
    18.   }
    19. printf("\t The percentage = %f and grade is %c ",per,grade);
    20. return 0;
}
```



Independent Paths:

#Edges=25, #Nodes=18, #P=1

$V(G) = E - N + 2P = 25 - 18 + 2 = 09$

- | | |
|-------------------------------------|---------|
| P1: 1-2-4-6-8-10-11-17-19-20 | E Grade |
| P2: 1-2-4-6-8-9-11-16-19-20 | D Grade |
| P3: 1-2-4-6-7-11-15-19-20 | C Grade |
| P4: 1-2-4-5-11-14-19-20 | B Grade |
| P5: 1-2-3-11-13-19-20 | A Grade |
| P6: 1-2-4-6-8-10-11-13-19-20 | |
| P7: 1-2-4-6-8-10-11-14-19-20 | |
| P8: 1-2-4-6-8-10-11-15-19-20 | |
| P9: 1-2-4-6-8-10-11-16-19-20 | |

SOFTWARE TESTING

Pre-Conditions/Issues:

Percentage Per is a positive Float Number

Test Cases – Absolute Grading

Paths	Input	Expected Output	Remarks
	Per		
P1: 1-2-4-6-8-10-11-17-19-20	< 60	E Grade, Satisfactory	Pass
P2: 1-2-4-6-8-9-11-16-19-20	60-69	D Grade, Above Average	Pass
P3: 1-2-4-6-7-11-15-19-20	70-79	C Grade, Good	Pass
P4: 1-2-4-5-11-14-19-20	80-89	B Grade, Very Good	Pass
P5: 1-2-3-11-13-19-20	>= 90	A Grade, Excellent	Pass
P6: 1-2-4-6-8-10-11-13-19-20	< 60	Excellent	Fail
P7: 1-2-4-6-8-10-11-14-19-20	< 60	Very Good	Fail
P8: 1-2-4-6-8-10-11-15-19-20	< 60	Good	Fail
P9: 1-2-4-6-8-10-11-16-19-20	< 60	Above Average	Fail



SOFTWARE TESTING

Program 11 and 12 (Next date program)

/* Design,develop,code and run the program in any suitable language to implement the NextDate function. Analyze it from the perspective boundary value testing and equivalence class analysis. Derive different test cases, execute these test cases and discuss the test results. */

```
#include<stdio.h>
int check(int day,int month)
{
    if((month==4||month==6||month==9 ||month==11) && day==31)
        return 1;
    else
        return 0;
}
int isleap(int year)
{
    if((year%4==0 && year%100!=0) || year%400==0)
        return 1;
    else
        return 0;
}
int main()
{
    int day,month,year,tomm_day,tomm_month,tomm_year;
    char flag;
    do
    {
        flag='y';
        printf("\nenter the today's date in the form of dd mm yyyy\n");
        scanf("%d%d%d",&day,&month,&year);
        tomm_month=month;
        tomm_year= year;
        if(day<1 || day>31)
        {
            printf("value of day, not in the range 1...31\n");
            flag='n';
        }
        if(month<1 || month>12)
        {
            printf("value of month, not in the range 1....12\n");
            flag='n';
        }
        else if(check(day,month))
        {
            printf("value of day, not in the range day<=30");
            flag='n';
        }
    }
```

SOFTWARE TESTING

```
if(year<=1812 || year>2013)
{
    printf("value of year, not in the range 1812.....2013\n");
    flag='n';
}
if(month==2)
{
    if(isleap(year) && day>29)
    {
        printf("invalid date input for leap year");
        flag='n';
    }
    else if(!(isleap(year))&& day>28)
    {
        printf("invalid date input for not a leap year");
        flag='n';
    }
}
}while(flag=='n');

switch (month)
{
    case 1:
    case 3:
    case 5:
    case 7:
    case 8:
    case 10:if(day<31)
        tomm_day=day+1;
        else
        {
            tomm_day=1;
            tomm_month=month+1;
        }
        break;
    case 4:
    case 6:
    case 9:
    case 11: if(day<30)
        tomm_day=day+1;
        else
        {
            tomm_day=1;
            tomm_month=month+1;
        }
        break;
```

SOFTWARE TESTING

```
case 12: if(day<31)
        tomm_day=day+1;
    else
    {
        tomm_day=1;
        tomm_month=1;
        if(year==2013)
        {
            printf("the next day is out of boundary value of year\n");
            tomm_year=year+1;
        }
        else
            tomm_year=year+1;
    }
    break;
case 2:
    if(day<28)
        tomm_day=day+1;
    else if(isleap(year)&& day==28)
        tomm_day=day+1;
    else if(day==28 || day==29)
    {
        tomm_day=1;
        tomm_month=3;
    }
    break;
}
printf("next day is : %d %d %d",tomm_day,tomm_month,tomm_year);
return 0;}
```

SOFTWARE TESTING

Test Case Name : Boundary Value Analysis test cases for Next date program

Experiment Number : 11

Test data : Enter the three integer value

Pre-condition : Month 1 to 12 , DAY 1 TO 31 AND YEAR 1812 TO 2013 / we are consider one corner of the input space

Brief Description :

	Min	Min +1	Normal	Max -1	Max
Month	1	2	6	11	12
Day	1	2	15	30	31
Year	1812	1813	1912	2012	2013

Next date Output Boundary Value Analysis Cases

Case Id	Description	Input Data			Expected Output			Actual output			Status	Comment
		Month	day	year	Month	day	year	Month	day	year		
1	Enter the min value month,day and year	1	1	1812	1	2	1812					
2	Enter the min+1 value for year and min for month and day	1	1	1813	1	2	1813					
3	Enter the normal value for year and min for month and day	1	1	1912	1	2	1912					
4	Enter the max -1 value for year and min for month and day	1	1	2012	1	2	2012					
5	Enter the max value for year and min for month and day	1	1	2013	1	2	2013					
6	Enter the min+1 value of day and min for month and year	1	2	1812	1	3	1812					
7	Enter the min+1 value for day and year and min for month	1	2	1813	1	3	1813					

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8	Enter the min+1 value for day , normal value for year and min value for month	1	2	1912	1	3	1912					
9	Enter the min+1 value for day , max -1 value for year and min value for month	1	2	2012	1	3	2012					
10	Enter the min+1 value for day , max value for year and min value for month	1	2	2013	1	3	2013					
11	Enter the normal value of day and min for year and month	1	15	1812	1	16	1812					
12	Enter the normal value for day and min+1 for year and min for month	1	15	1813	1	16	1813					
13	Enter the normal value for day normal value for year and min value for month	1	15	1912	1	16	1912					
14	Enter the normal value for day , max -1 value for year and min value for month	1	15	2012	1	16	2012					
15	Enter the normal value for day , max value for year and min value for month	1	15	2013	1	16	2013					
16	Enter the max - 1 value of day and min for day and year	1	30	1812	1	31	1812					
17	Enter the max -1 value for day and min for month and min+1 for year	1	30	1813	1	31	1813					
18	Enter the max - 1 value for day , normal value for year and min value for month	1	30	1912	1	31	1912					
19	Enter the max - 1 value for day , max -1 value for year and min value for month	1	30	2012	1	31	2012					
20	Enter the max -1 value for day , max value for year and min value for month	1	30	2013	1	31	2013					

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21	Enter the max value of day and min for year and month	1	31	1812	2	1	1812					
22	Enter the max value for day and min for month and min + 1 for year	1	31	1813	2	1	1813					
	Enter the max value for day , normal value for year and min value for month	1	31	1912	2	1	1912					
24	Enter the max value for day , max -1 value for year and min value for month	1	31	2012	2	1	2012					
25	Enter the max value for day , max value for year and min value for month	1	31	2013	2	1	2013					

Next date Output Special value test cases

Case Id	Description	Input Data			Expected Output			Actual output			Status	Comment
		month	day	year	month	day	year	month	day	year		
1	Enter the D1, M1 and Y1 valid cases	12	31	1811	Should display the message value of the year in range 1812..2013							
2	Enter the D1, M1 and Y2 valid cases	12	31	2012	1	1	2013					
3	Enter the D1, M1 and Y3 valid cases	12	31	2013	Should display the message Next is out of boundary 2013							

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Test Case Name : Equivalence class test cases for Next date

Experiment Number : 12

Test data : Enter the three integer value

Pre-condition : Month 1 to 12 , DAY 1 TO 31 AND YEAR 1812 TO 2013

Valid Cases

M1 = { month ; $1 \leq \text{month} \leq 12$ }

D1 = { day : $1 \leq \text{day} \leq 31$ }

Y1 = { year : $1812 \leq \text{year} \leq 2013$ }

Invalid cases

M2 = { month : month < 1 }

M3 = { month : month > 12 }

D2 = { day : day < 1 }

D3 = { day : day > 31 }

Y2 = { year : year < 1812 }

Y3 = { year : year > 2013 }

Next date Output Equivalence Class Testing (Weak and Strong Normal Equivalence Class)

Case Id	Description	Input Data			Expected Output			Actual output			Status	Comment
		month	day	year	month	day	year	month	day	year		
WN1,SN1	Enter the M1, D1 and Y1 valid cases	6	15	1912	6	16	1912					

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(Weak Robustness Equivalence Class)

Case Id	Description	Input Data			Expected Output			Actual output			Status	Comment
		month	day	year	month	day	year	month	day	year		
WR1	Enter the M1, D1 and Y1 cases	6	15	1912	6	16	1912					
WR2	Enter the M2 , D1 and Y1 cases	-1	15	1912	Should display the message value of the month not in the range 1..12							
WR3	Enter the M3 ,D1 and Y1 cases	13	15	1912	Should display the message value of the month not in the range 1..12							
WR4	Enter the M1, D2 and Y1 cases	6	-1	1912	Should display the message value of the day not in the range 1..31							
WR5	Enter the M1, D3 and Y1 cases	6	32	1912	Should display the message value of the day not in the range 1..31							
WR6	Enter the M1, D1 and Y2 cases	6	15	1811	Should display the message value of the year not in the range 1812..2013							
WR7	Enter the M1, D1 and Y3 cases	6	15	2014	Should display the message value of the year not in the range 1812..2013							

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(Strong Robustness Equivalence Class)

Case Id	Description	Input Data			Expected Output	Actual output	Status	Comment
		month	day	year				
SR1	Enter the M2 , D1 and Y1 cases	-1	15	1912	Should display the message value of the month not in the range 1..12			
SR2	Enter the M1, D2 and Y1 cases	6	-1	1912	Should display the message value of the day not in the range 1..31			
SR3	Enter the M1, D1 and Y2 cases	6	15	1811	Should display the message value of the year not in the range 1812..2013			
SR4	Enter the M2 , D2 and Y1 cases	-1	-1	1912	(i)Should display the message value of the month in range 1..12			
					(ii) Should display the message value of the day in range 1..31			
SR5	Enter the M1, D2 and Y2 cases	6	-1	1811	(i) Should display the message value of the day in range 1..31			
					(ii) Should display the message value of the year in range 1812..2013			
SR6	Enter the M2, D1 and Y2 cases	-1	15	1811	(i)Should display the message value of the month in range 1..12			
					(ii) Should display the message value of the year in range 1812..2013			
SR7	Enter the M2, D2 and Y2 cases	-1	-1	1811	(i)Should display the message value of the month in range 1..12			
					(ii) Should display the message value of the day in range 1..31			
					(iii) Should display the message value of the year in range 1812..2013			

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Some addition equivalence Boundary checking

Case Id	Description	Input Data			Expected Output			Actual output			Status	Comment
		day	month	year	day	month	year	day	month	year		
1	Enter the D1, M1 and Y1 valid cases	31	12	1811	Should display the message value of the year in range 1812..2013							
2	Enter the D1, M1 and Y2 valid cases	31	12	2012	1	1	2013					
3	Enter the D1, M1 and Y3 valid cases	31	12	2013	Should display the message Next is out of boundary 2013							