Program 3 and 6 (Boundary Value Analysis and Equivalence Class Testing)

/* Design, develop, code and run the program in any suitable language to implement the NextDate function. Analyze it from the perspective of 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';
          }

if(year<1812 || year>2019)
{
   printf("value of year, not in the range 1812.....2019\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;

case 12: if(day<31)
tomm_day=day+1;
else
   {
     tomm_day=1;
     tomm_month=1;
 if(year= =2019)
  {
     printf("the next day is out of boundary value of year\n");
   }

    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;
}
```

Test Case Name : Boundary Value Analysis test cases for NextDate program

Experiment Number :3

Test data : Enter the three integer value
Pre-condition : Month 1 to 12, Day 1 to 31 and Year 1812 to 2019

Brief Description :

	Min	Min +1	Normal	Max -1	Max
Month	1	2	6	11	12
Day	1	2	15	**29/30**	**30/31**
Year	1812	1813	1915	2018	2019

NextDate Boundary Value test cases (day=1 to 30)

Case Id	Description	Input Data			Expected Output			Actual output			Status	Comment
		month	day	year	month	day	year	month	day	year		
1	Enter day and month as nominal value and vary year from min to max	6	15	1812	6	16	1812					
2	Enter day and month as nominal value and vary year from min to max	6	15	1813	6	16	1813					
3	Enter day and month as nominal value and vary year from min to max	6	15	1915	6	16	1915					
4	Enter day and month as nominal value and vary year from min to max	6	15	2018	6	16	2018					
5	Enter year and month as nominal value and vary day from min to max	6	15	2019	6	16	2019					
6	Enter year and month as nominal value and vary day from min to max	6	1	1915	6	2	1915					

7	Enter year and month as nominal value and vary day from min to max	6	2	1915	6	3	1915					
8	Enter year and month as nominal value and vary day from min to max	6	15	1915	6	16	1915					
9	Enter year and month as nominal value and vary day from min to max	6	29	1915	6	30	1915					
10	Enter year and month as nominal value and vary day from min to max	6	30	1915	7	1	1915					
11	Enter year and day as nominal value and vary month from min to max	1	15	1915	1	16	1915					
12	Enter year and day as nominal value and vary month from min to max	2	15	1915	2	16	1915					
13	Enter year and day as nominal value and vary month from min to max	6	15	1915	6	16	1915					
14	Enter year and day as nominal value and vary month from min to max	11	15	1915	11	16	1915					
15	Enter year and day as nominal value and vary month from min to max	12	15	1915	12	16	1915					

NextDate Boundary Value test cases (day=1 to 31)

Case Id	Description	Input Data			Expected Output			Actual output			Status	Comment
		month	day	year	month	day	year	month	day	year		
1	Enter day and month as nominal value and vary year from min to max	7	15	1812	7	16	1812					
2	Enter day and month as nominal value and vary year from min to max	7	15	1813	7	16	1813					
3	Enter day and month as nominal value and vary year from min to max	7	15	1915	7	16	1915					
4	Enter day and month as nominal value and vary year from min to max	7	15	2018	7	16	2018					

5	Enter year and month as nominal value and vary day from min to max	7	15	2019	7	16	2019						
6	Enter year and month as nominal value and vary day from min to max	7	1	1915	7	2	1915						
7	Enter year and month as nominal value and vary day from min to max	7	2	1915	7	3	1915						
8	Enter year and month as nominal value and vary day from min to max	7	15	1915	7	16	1915						
9	Enter year and month as nominal value and vary day from min to max	7	30	1915	7	31	1915						
10	Enter year and month as nominal value and vary day from min to max	7	31	1915	8	1	1915						
11	Enter year and day as nominal value and vary month from min to max	1	15	1915	1	16	1915						
12	Enter year and day as nominal value and vary month from min to max	2	15	1915	2	16	1915						
13	Enter year and day as nominal value and vary month from min to max	7	15	1915	7	16	1915						
14	Enter year and day as nominal value and vary month from min to max	11	15	1915	11	16	1915						
15	Enter year and day as nominal value and vary month from min to max	12	15	1915	12	16	1915						

NextDate Worst case 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 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	1915	1	2	1915					

4	Enter the max -1 value for year and min for month and day	1	1	2018	1	2	2018					
5	Enter the max value for year and min for month and day	1	1	2019	1	2	2019					
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					
8	Enter the min+1 value for day , normal value for year and min value for month	1	2	1915	1	3	1915					
9	Enter the min+1 value for day , max -1 value for year and min value for month	1	2	2018	1	3	2018					
10	Enter the min+1 value for day , max value for year and min value for month	1	2	2019	1	3	2019					
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	1915	1	16	1915					
14	Enter the normal value for day , max -1 value for year and min value for month	1	15	2018	1	16	2018					
15	Enter the normal value for day , max value for year and min value for month	1	15	2019	1	16	2019					
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	1915	1	31	1915					

19	Enter the max - 1 value for day , max -1 value for year and min value for month	1	30	2018	1	31	2018					
20	Enter the max -1 value for day , max value for year and min value for month	1	30	2019	1	31	2019					
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					
23	Enter the max value for day , normal value for year and min value for month	1	31	1915	2	1	1915					
24	Enter the max value for day , max -1 value for year and min value for month	1	31	2018	2	1	2018					
25	Enter the max value for day , max value for year and min value for month	1	31	2019	2	1	2019					

NextDate 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 valid value for month, day and year	12	31	1811	Should display the message value of the year not in range 1812..2019							
2	Enter the valid value for month, day and year	12	31	2018	1	1	2019					
3	Enter the valid value for month, day and year	12	31	2019	Should display the message Next year is out of boundary 2019							
4	Enter the valid value for month, day and year	2	28	1900	3	01	1900					

5	Enter the valid value for month, day and year	2	28	2014	3	01	2014						
6	Enter the valid value for month, day and year	2	29	2012	3	01	2012						
7	Enter the valid value for month, day and year	2	29	2020	Should display the message value of the year not in range 1812..2019								
8	Enter the valid value for month, day and year	2	28	2012	2	29	2012						
9	Enter the valid value for month, day and year	2	28	2000	2	29	2000						
10	Enter the valid value for month, day and year	2	29	2000	3	01	2000						

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	✓	✓	✓	✓						✓			✓	✓	✓