Question 1:

Write a program which gets an integer n from the user; assume that the user will always enter a number greater than 0 and less than 10000. Have your program determine and output the number of digits of n.

Examples:

- n = 123, the program should output : “the number has 3 digits”

- n = 3000, the program should output : “the number has 4 digits”

You must implement two solutions : one using selection statements (if statements or switch statement); and one solution without using any selection statement. 50% of the mark is allocated to each version.

Answer:

```
#include <stdio.h>
#include <iostream>
using namespace std;

int main()
{

 int n;
 cout<< "enter the value of n: ";
 cin>> n;

 if(n>0 && n<10)
 {
    cout<< "the number of digits in n is: 1";}

    else if(n>=10 && n<100)
    {
       cout<< "the number of digits in n is: 2";}

       else if(n>=100 && n<1000)
       {
          cout<<"the number of digits in n is: 3";}
```

```
   return 0;
}

#include <stdio.h>
#include <iostream>
using namespace std;

int main()
{

 int n,z;

 cout<< "enter the value of n: ";
 cin>> n;

 z = 1+(n>9)+(n>99)+(n>999);
 cout<<z;



   return 0;
}
```

Question 2:

Given a date: month, day in the current year 2019, we want to determine the number of days from month/day to the end of the year (December 31).

Recall that months 1, 3, 5, 7,8,10, 12 have 31 days; month 2 has 28 days; months 4, 6, 9, 11 have 30 days.

Have your program obtain month and day (both variables are intergers) from the user. Then check that month and day define a valid date. Recall that the problem focuses only on dates in 2019. When the date is invalid, output the message : “Invalid date”.

Only when the entered date is valid, determine T, the total number of days from the entered day to the end of the year 2019.

Examples:

- month = 2, day =29, the output should be : “Invalid date”

- month = 4, day =32, the output should be “Invalid date”

- month = 12, day = 30, the output should be : “1 day(s)”

- month = 1, day = 1, the output should be : “364 day(s)”

To determine T, your solution must implement the switch statement. Using if statements (if(){}else{}, or if() {}else if () ...) or using any loop statement (for students who know the loops) to determine T will result in the grade 0 for this problem.

Answer:

```
#include <stdio.h>
#include <iostream>
using namespace std;

int main()
{

 int d,m,m1,m2,m3,m4,m5,m6,m7,m8,m9,m10,m11,m12;

 m1 = 31;
 m2 = 28;
 m3 = 31;
 m4 = 30;
 m5 = 31;
 m6 = 30;
 m7 = 31;
```

```
 m8 = 31;
 m9 = 30;
 m10 = 31;
 m11 = 30;
 m12 = 31;

cout << "enter month ";
cin>> m;
cout<< "enter day ";
cin>> d;

 if ( (m== 1 || m == 3 || m == 5 || m == 7 || m== 8 || m== 10 || m==12 )&& d>31)
 {
    cout<< "please enter a valid date";

 }

    else if ( m == 2 && d>28)
    {
       cout<<"please enter a valid date";}

       else if ( (m == 4 || m== 6 || m== 9 || m== 11) && d>30)
       {
          cout<<"please enter a valid date";}

          else {
             switch(m)
             {
                case 1: cout<< 365 - d;
                break;
                case 2: cout<< 365 - (m1+d);
                break;
                case 3: cout<< 365 - (m1+m2+d);
```

```
                break;
                case 4: cout<< 365 - (m1+m2+m3+d);
                break;
                case 5: cout<< 365 - (m1+m2+m3+m4+d);
                break;
                case 6: cout<< 365 - (m1+m2+m3+m4+m5+d);
                break;
                case 7: cout<< 365 - (m1+m2+m3+m4+m5+m6+d);
                break;
                case 8: cout<< 365 - (m1+m2+m3+m4+m5+m6+m7+d);
                break;
                case 9: cout<< 365 - (m1+m2+m3+m4+m5+m6+m7+m8+d);
                break;
                case 10: cout<< 365 - (m1+m2+m3+m4+m5+m6+m7+m8+m9+d);
                break;
                case 11: cout<< 365 - (m1+m2+m3+m4+m5+m6+m7+m8+m9+m10+d);
                break;
                case 12: cout<< 365 - (m1+m2+m3+m4+m5+m6+m7+m8+m9+m10+m11+d);
                break;

}}
return 0;
}
```