Name: **Tushar Nankani** Roll No: **1902112** Batch: **C23**

**Microprocessor: Experiment 8**

**Aim**: Mixed Language program to check if given year is a leap year or not.

**Theory:**

Mixed-language programming is the process of building programs in which the source code is written in two or more languages.

It allows you to:

• Call existing code that is written in another language

• Use procedures that may be difficult to implement in a particular language

• Gain advantages in processing speeds

Mixed-language programming is possible between Intel Fortran and other languages.

Although other languages (such as assembly language) are discussed,

the primary focus of this section is programming using Intel Fortran and C/C++ .

Mixed language programming between these two languages is relatively

straightforward because each language implements functions, subroutines, and

procedures in approximately the same way.

**What is leap year?**

Leap year is the year having 1 extra day in the calendar, i.e. a leap year has 366 days instead of 365, which are there in an ordinary year. (February 29 is added in a leap year which has 28 days in an ordinary year). Mathematically, years divisible by 4 are considered leap years except for the century years as it occurs after every 4 years.

**Logic to find Leap Year**

1. In general, as the leap year occurs after every 4 years, so a leap year is the

one that should be evenly divisible by 4.

2. Since after every 100 years, we skip a leap year unless it is divisible by 400.

So, for a year to be a leap year, it should be divisible by 100.

3. If the year is divisible by 100, it should also be divisible by 400; then, it is

considered a leap year.

4. If the year is divisible by 100 but not by 400, it is not considered to be a leap

year.

**ALGORITHM:**

1. START
2. Take integer variable year
3. Assign value to the variable
4. Check if year is divisible by 4 but not 100, DISPLAY "leap year"
5. Check if year is divisible by 400, DISPLAY "leap year"
6. Otherwise, DISPLAY "not leap year"
7. STOP

**CODE:**

#include<stdio.h>

#include<conio.h>

void main()

{

int y,num;

clrscr();

printf("\nEnter year : ");

scanf("%d",&y);

asm mov ax,y

asm mov bx,04h

asm mov num,ax

asm mov dx,00h

asm div bx

asm cmp dx,00h

asm jz label1

printf("\n%d is not a leap year");

asm jmp exit

label1:

asm mov ax,num

asm mov dx,00h

asm mov bx,400h

asm div bx

asm cmp dx,00h

asm jz label2

printf("\n%d is a leap year",y);

asm jmp exit

label2:

asm mov ax,num

asm mov dx,00h

asm mov bx,100h

asm div bx

asm cmp dx,00h

asm jz label3:

printf("\n%d is a leap year",y);

asm jmp exit

label3:

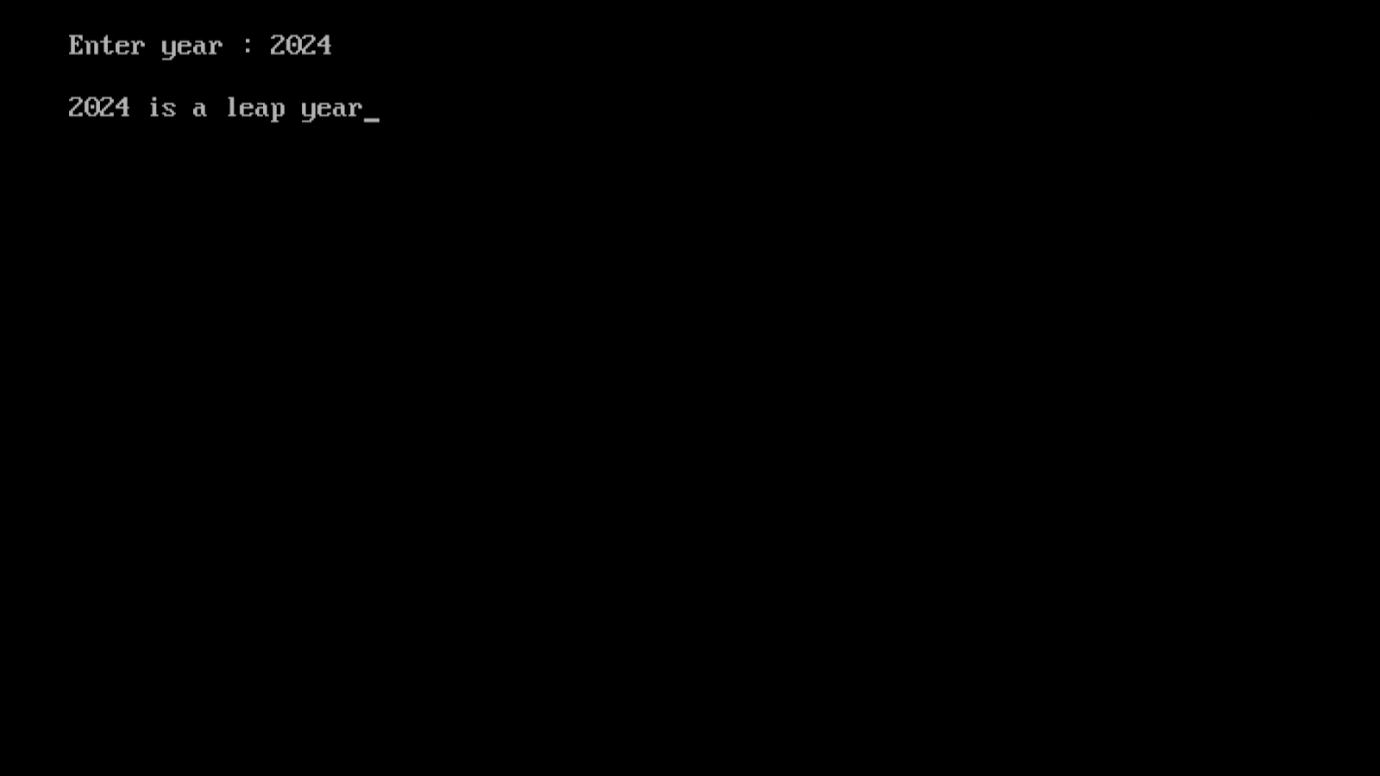
printf("\n%d is not a leap year",y);

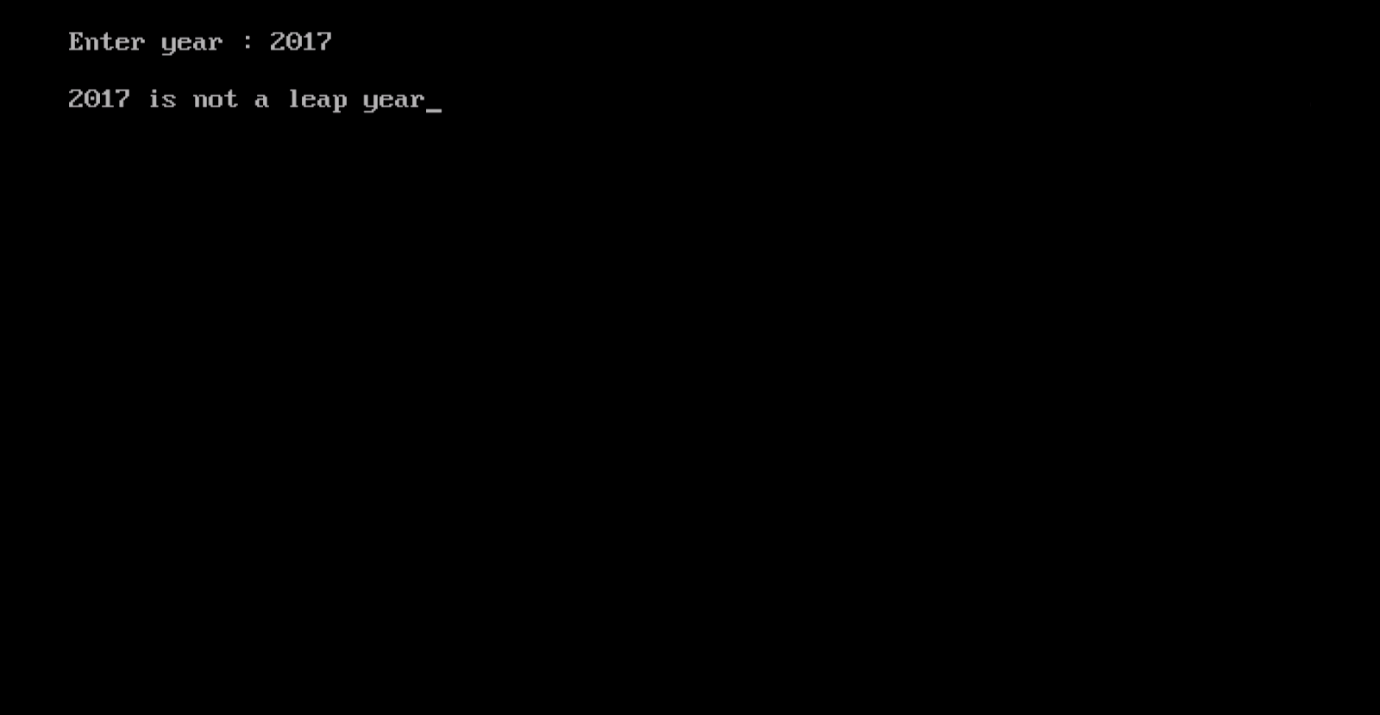
exit:

getch();

}

OUTPUT:

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