

# Control Statements

if else

```
if(condition)
{
    statement;
    .....
}
```

```
if(condition)
{
    statement;
    .....
}
else
{
    statement;
    .....
}
```

## P1. Program to print a message if negative number is entered

```
#include<stdio.h>
main( )
{
    int num;
    printf("Enter a number : ");
    scanf("%d",&num);
    if(num<0)
        printf("Number entered is negative\n");
    printf("Value of num is : %d\n", num);
}
```

**1<sup>st</sup> run:**

Enter a number : -6

Number entered is negative

Value of num is -6

**2<sup>nd</sup> run:**

Enter a number : 8

Value of num is 8

## P2. Program to print the larger and smaller of the two numbers

```
#include<stdio.h>
```

```
main( )
```

```
{
```

```
    int  a,b;
```

```
    printf("Enter the first number : ");
```

```
    scanf("%d",&a);
```

```
    printf("Enter the second number : ");
```

```
    scanf("%d",&b);
```

```
    if(a>b)
```

```
        printf("larger number = %d and smaller number = %d\n",a,b);
```

```
    else
```

```
        printf("larger number = %d and smaller number = %d\n",b,a);
```

```
}
```

### P3. Program to print whether the number is even or odd

```
#include<stdio.h>
main( )
{
    int num;
    printf("Enter a number : ");
    scanf("%d",&num);
    if(num%2==0)                /*test for even */
        printf("Number is even\n");
    else
        printf("Number is odd\n");
}
```

# Nested if... else

```
if(condition 1)
{
    if(condition 2)
        statementA1;
    else
        statementA2;
}
else
{
    if(condition 3)
        statementB1;
    else
        statementB2 ;
}
```

```
if (grade == 'A')
{
    if (marks > 95)
        printf("Excellent");
}
else
    printf("Work hard for getting A grade");
```

```
if (grade == 'A')
    if (marks > 95)
        printf("Excellent");
else
    printf("Work hard for getting A grade");
```

## P4. Program to find largest number from three given numbers

```
#include<stdio.h>
main( )
{
    int  a,b,c,large;
    printf("Enter three numbers : ");
    scanf("%d%d%d",&a,&b,&c);
    if(a>b)
    {
        if(a>c)
            large=a;
        else
            large=c;
    }
    else
    {
        if(b>c)
            large=b;
        else
            large=c;
    }
    printf("Largest number is %d\n",large);
}/*End of main( )*/
```



P5. Find whether a year is leap or not. A centennial(divisible by 100) year is leap year if it is divisible by 400, and a non centennial year is leap if it is divisible by 4

```
#include<stdio.h>
main( )
{
    int year;
    printf("Enter year : ");
    scanf("%d",&year);
    if(year%100==0)
    {
        if(year%400==0)
            printf("Leap year\n");
        else
            printf("Not leap\n");
    }
    else
    {
        if(year%4==0)
            printf("Leap year\n");
        else
            printf("Not leap\n");
    }
}
```

```
if(year%4==0 && year%100!=0 || year%400==0)
    printf("Leap year\n");
else
    printf("Not leap\n");
```

if..else if..else

```
if ( condition1)
    statementA;
else if (condition2)
    statementB;
else if ( condition 3)
    statementC;
else
    statementD;
```

/\*P5.6 Program to find out the grade of a student when the marks of 4 subjects are given. The method of assigning grade is as-

per >= 85		grade=A
per < 85	and per >= 70	grade=B
per < 70	and per >= 55	grade=C
per < 55	and per >= 40	grade=D
per < 40		grade=E

Here, per is percentage.

```
#include<stdio.h>
```

```
main( )
```

```
{
```

```
    float m1,m2,m3,m4,total,per;
```

```
    char grade;
```

```
    printf("Enter marks of 4 subjects : ");
```

```
    scanf("%f%f%f%f",&m1,&m2,&m3,&m4);
```

```
    total=m1+m2+m3+m4;
```

```
    per=total/4;
```

```
if(per>=85)
    grade='A';
else if(per>=70)
    grade='B';
else if(per>=55)
    grade='C';
else if(per>=40)
    grade='D';
else
    grade='E';
printf("Percentage is %f\nGrade is %c\n",per,grade);
```

```
if(per>=85)
    grade='A';
if(per<85&&per>=70)
    grade='B';
if(per<70&&per>=55)
    grade='C';
if(per<55&&per>=40)
    grade='D';
if(per<40)
    grade='E';
```

# HOME WORK PROGRAMS

**P1.** Write a program that calculates the user's body mass index (BMI) and categorizes it as underweight, normal, overweight, or obese, based on the following table from the United States Centers for Disease Control. Prompt the user to enter weight in pounds and height in inches.

BMI	Weight Status
Below 18.5	Underweight
18.5–24.9	Normal
25.0–29.9	Overweight
30.0 and above	Obese

To calculate BMI based on weight in pounds (*wt\_lb*) and height in inches (*ht\_in*), use this formula (rounded to tenths):

$$\frac{703 \times wt\_lb}{ht\_in^2}$$

**P2.** Write a program that reports the contents of a compressed-gas cylinder based on the first letter of the cylinder's color. The program input is a character representing the observed color of the cylinder: 'Y' or 'y' for yellow, 'O' or 'o' for orange, and so on. Cylinder colors and associated contents are as follows. Your program should respond to input of a letter other than the first letters of the given colors with the message: "Contents Unknown" .

orange	ammonia
brown	carbon monoxide
yellow	hydrogen
green	oxygen



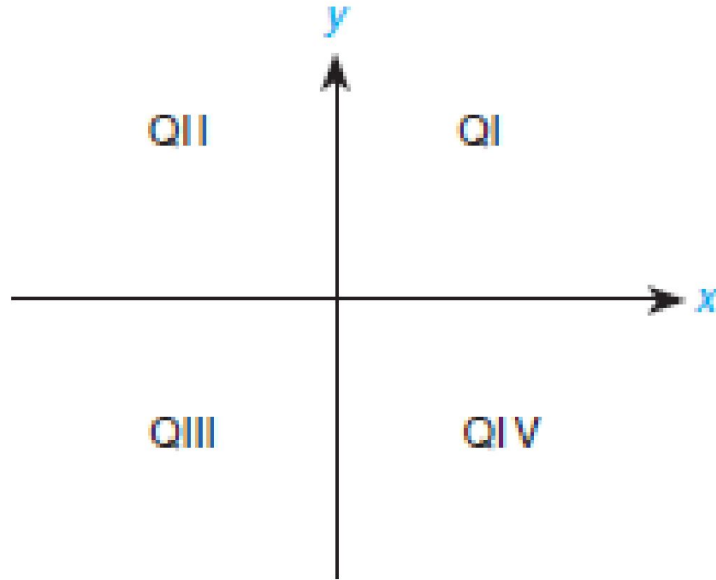
**P3.** The National Earthquake Information Center has asked you to write a program implementing the following decision table to characterize an earthquake based on its Richter scale number.

Richter Scale Number (n)	Characterization
$n < 5.0$	Little or no damage
$5.0 \leq n < 5.5$	Some damage
$5.5 \leq n < 6.5$	Serious damage: walls may crack or fall
$6.5 \leq n < 7.5$	Disaster: houses and buildings may collapse
higher	Catastrophe: most buildings destroyed

**P4.** Write a program that takes the  $(x, y)$  coordinates of a point in the Cartesian plane and prints a message telling either an axis on which the point lies or the quadrant in which it is found. Sample lines of output:

$(-1.0, -2.5)$  is in quadrant III

$(0.0, 4.8)$  is on the  $y$ -axis



**P5.** Write a program that interacts with the user like this:

- (1) Carbon monoxide
- (2) Hydrocarbons
- (3) Nitrogen oxides
- (4) Nonmethane hydrocarbons

Enter pollutant number >> 2

Enter number of grams emitted per mile >> 0.35

Enter odometer reading >> 40112

Emissions exceed permitted level of 0.31 grams/mile.

Use the table of emissions limits below to determine the appropriate message.

	First 50,000 Miles	Second 50,000 Miles
carbon monoxide	3.4 grams/mile	4.2 grams/mile
hydrocarbons	0.31 grams/mile	0.39 grams/mile
nitrogen oxides	0.4 grams/mile	0.5 grams/mile
nonmethane hydrocarbons	0.25 grams/mile	0.31 grams/mile