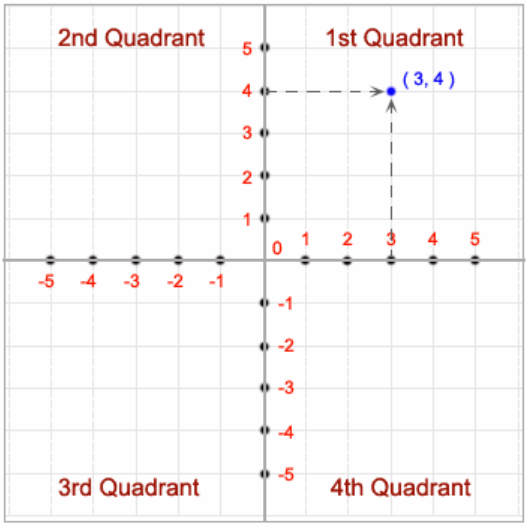
Example Programs Control Statements

1. Write a C program to read the value of an integer m and display the value of n is 1 when m is larger than 0, 0 when m is 0 and -1 when m is less than 0

```
#include <stdio.h>
void main()
{
   int m,n;
   printf("Input the  value of m :");
   scanf("%d",&m);
   if(m!=0)
     if(m>0)
      n=1;
     else
      n=-1;
   else
     n=0;
   printf("The value of m = %d \n",m);
   printf("The value of n = %d \n",n);
}
```

```
Output:
Input the  value of m :5
The value of m = 5
The value of n = 1
```

2. Write a C program to accept a coordinate point in a XY coordinate system and determine in which quadrant the coordinate point lies.



```c
#include <stdio.h>
void main()
{
      int co1,co2;

      printf("Input the values for X and Y coordinate : ");
      scanf("%d %d",&co1,&co2);

      if( co1 > 0 && co2 > 0)
        printf("The coordinate point (%d,%d) lies in the First
quandrant.\n",co1,co2);
      else if( co1 < 0 && co2 > 0)
        printf("The coordinate point (%d,%d) lies in the Second
quandrant.\n",co1,co2);
      else if( co1 < 0 && co2 < 0)
        printf("The coordinate point (%d, %d) lies in the Third
quandrant.\n",co1,co2);
      else if( co1 > 0 && co2 < 0)
        printf("The coordinate point (%d,%d) lies in the Fourth
quandrant.\n",co1,co2);
      else if( co1 == 0 && co2 == 0)
        printf("The coordinate point (%d,%d) lies at the origin.\n",co1,co2);

}
```

Sample Output:

```
Input the values for X and Y coordinate : 7 9
The coordinate point (7,9) lies in the First quandrant.
```

3. Write a C program to find the eligibility of admission for a professional course based on the following criteria:
Eligibility Criteria : Marks in Maths >=65 and Marks in Phy >=55 and Marks in Chem>=50 and Total in all three subject >=190 or Total in Maths and Physics >=140

Input the marks obtained in Physics :65 Input the marks obtained in Chemistry :51 Input the marks obtained in Mathematics :72 Total marks of Maths, Physics and Chemistry : 188 Total marks of Maths and Physics : 137 The candidate is not eligible.

Expected Output **:**

The candidate is not eligible for admission.

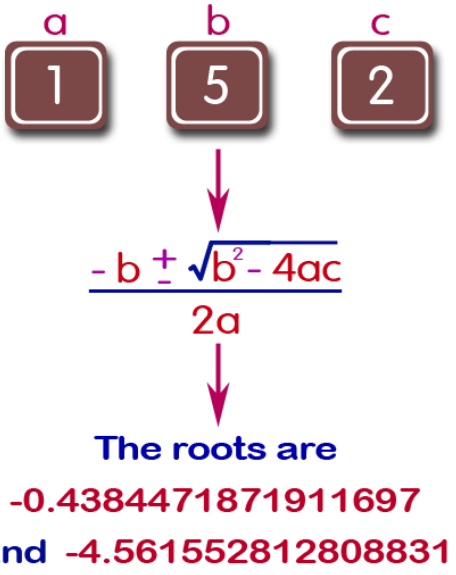
```c
#include <stdio.h>
void main()
{  int p,c,m,t,mp;

   printf("Eligibility Criteria :\n");
   printf("Marks in Maths >=65\n");
   printf("and Marks in Phy >=55\n");
   printf("and Marks in Chem>=50\n");
   printf("and Total in all three subject >=190\n");
   printf("or Total in Maths and Physics >=140\n");
   printf("-------------------------------------\n");

   printf("Input the marks obtained in Physics :");
   scanf("%d",&p);
   printf("Input the marks obtained in Chemistry :");
   scanf("%d",&c);
   printf("Input the marks obtained in Mathematics :");
   scanf("%d",&m);
   printf("Total marks of Maths, Physics and Chemistry : %d\n",m+p+c);
   printf("Total marks of Maths and  Physics : %d\n",m+p);

   if (m>=65)
         if(p>=55)
             if(c>=50)
              if((m+p+c)>=190||(m+p)>=140)
                 printf("The  candidate is eligible for admission.\n");
              else
                printf("The candidate is not eligible.\n");
             else
          printf("The candidate is not eligible.\n");
         else
        printf("The candidate is not eligible.\n");
    else
     printf("The candidate is not eligible.\n");
           }
```

Sample Output:

```
Eligibility Criteria :
Marks in Maths >=65
and Marks in Phy >=55
and Marks in Chem>=50
and Total in all three subject >=190
or Total in Maths and Physics >=140
-------------------------------------
Input the marks obtained in Physics :65
Input the marks obtained in Chemistry :51
Input the marks obtained in Mathematics :72
```

```
Total marks of Maths, Physics and Chemistry : 188
Total marks of Maths and  Physics : 137
The candidate is not eligible.
```

4. Write a C program to calculate the root of a Quadratic Equation
   Test Data : 1 5 7
   Expected Output :
   Root are imaginary;




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

void main()
{
   int a,b,c,d;
   float x1,x2;

   printf("Input the value of a,b & c : ");
   scanf("%d%d%d",&a,&b,&c);
   d=b*b-4*a*c;
   if(d==0)
   {
     printf("Both roots are equal.\n");
     x1=-b/(2.0*a);
     x2=x1;
     printf("First  Root Root1= %f\n",x1);
     printf("Second Root Root2= %f\n",x2);
   }
   else if(d>0)
      {
```

```
        printf("Both roots are real and diff-2\n");
        x1=(-b+sqrt(d))/(2*a);
        x2=(-b-sqrt(d))/(2*a);
        printf("First  Root Root1= %f\n",x1);
        printf("Second Root root2= %f\n",x2);
    }
    else
        printf("Root are imeainary;\nNo Solution. \n");
    }
```

Sample Output:

```
Input the value of a,b & c : 1 5 7
Root are
imaginary;
No Solution.
```

5. Write a C program to read temperature in centigrade and display a suitable message according to temperature state below :

   Temp < 0 then Freezing weather
   Temp 0-10 then Very Cold weather
   Temp 10-20 then Cold weather
   Temp 20-30 then Normal in Temp
   Temp 30-40 then Its Hot
   Temp >=40 then Its Very Hot
   Test Data :
   42
   Expected Output :
   Its very hot

```
#include <stdio.h>
void main()
{
    int tmp;

    printf("Input days temperature : ");
    scanf("%d",&tmp);
  if(tmp<0)
           printf("Freezing weather.\n");
  else if(tmp<10)
         printf("Very cold weather.\n");
         else if(tmp<20)
                    printf("Cold weather.\n");
                else if(tmp<30)
                           printf("Normal in temp.\n");
                       else if(tmp<40)
                                  printf("Its Hot.\n");
```

```
                                    else
                                            printf("Its very hot.\n");

    }
```

Sample Output:

```
Input days temperature : 42
Its very hot.
```

6. Write a C program to check whether a character is an alphabet, digit or special character

```
#include <stdio.h>
int main()
{
   char sing_ch;

   printf("Input a character: ");
   scanf('%c', &sing_ch);

   /* Checks whether it is an alphabet */
   if((sing_ch>='a' && sing_ch<='z') || (sing_ch>='A' && sing_ch<='Z'))
   {
      printf("This is an alphabet.\n");
   }
   else if(sing_ch>='0' && sing_ch<='9') /* whether it is digit */
   {
      printf("This is a digit.\n");
   }
   else /* Else special character */
   {
      printf("This is a special character.\n");
   }
}
```

7. Write a program in C to calculate and print the Electricity bill of a given customer. The customer id., name and unit consumed by the user should be taken from the keyboard and display the total amount to pay to the customer. The charge are as follow :

Unit	**Charge/unit**
upto 199	@1.20

200 and above but less than 400	@1.50
400 and above but less than 600	@1.80
600 and above	@2.00

If bill exceeds Rs. 400 then a surcharge of 15% will be charged and the minimum bill should be of Rs. 100/-

Test Data :

1001

James

800

Expected Output :

Customer IDNO :1001

Customer Name :James

unit Consumed :800

Amount Charges @Rs. 2.00 per unit : 1600.00

Surchage Amount : 240.00

Net Amount Paid By the Customer : 1840.00

```
#include <stdio.h>
#include <string.h>
void main()
{
   int custid, conu;
   float chg, surchg=0, gramt,netamt;
   char connm[25];

   printf("Input Customer ID :");
   scanf("%d",&custid);
   printf("Input the name of the customer :");
   scanf("%s",connm);
   printf("Input the unit consumed by the customer : ");
   scanf("%d",&conu);
   if (conu <200 )
         chg = 1.20;
   elseif (conu>=200 && conu<400)
                  chg = 1.50;
         else if (conu>=400 && conu<600)
                        chg = 1.80;
                  else
```

```
                        chg = 2.00;
    gramt = conu*chg;
    if (gramt>300)
          surchg = gramt*15/100.0;
    netamt = gramt+surchg;
    if (netamt  < 100)
          netamt =100;
    printf("\nElectricity Bill\n");
    printf("Customer IDNO                    :%d\n",custid);
    printf("Customer Name                    :%s\n",connm);
    printf("unit Consumed                   :%d\n",conu);
    printf("Amount Charges @Rs. %4.2f  per unit :%8.2f\n",chg,gramt);
    printf("Surchage Amount                  :%8.2f\n",surchg);
    printf("Net Amount Paid By the Customer     :%8.2f\n",netamt);

}
```

8. Write a C program to find the sum of first 10 natural numbers
   Expected Output :
   The first 10 natural number is :
   1 2 3 4 5 6 7 8 9 10
   The Sum is : 55

```
#include <stdio.h>
int main()
{
   int  j, sum = 0;

   printf("The first 10 natural number is :\n");

   for (j = 1; j <= 10; j++)
   {
      sum = sum + j;
      printf("%d ",j);
   }
   printf("\nThe Sum is : %d\n", sum);
}
```

9. Write a program in C to display n terms of natural number and their sum.
   Test Data : 7
   Expected Output :
   The first 7 natural number is :

1 2 3 4 5 6 7
The Sum of Natural Number upto 7 terms : 28

```
#include <stdio.h>
void main()
{
  int i,n,sum=0;
  printf("Input Value of terms : ");
  scanf("%d",&n);
  printf("\nThe first %d natural numbers are:\n",n);
  for(i=1;i<=n;i++)
  {
   printf("%d ",i);
   sum+=i;
  }
  printf("\nThe Sum of natural numbers upto %d terms : %d \n",n,sum);

}
```

10. Write a program in C to display the cube of the number upto given an integer.
    Test Data :
    Input number of terms : 5
    Expected Output :
    Number is : 1 and cube of the 1 is :1
    Number is : 2 and cube of the 2 is :8
    Number is : 3 and cube of the 3 is :27
    Number is : 4 and cube of the 4 is :64
    Number is : 5 and cube of the 5 is :125

```
#include <stdio.h>
void main()
 {
   int i,ctr;
   printf("Input number of terms : ");
   scanf("%d", &ctr);
   for(i=1;i<=ctr;i++)
   {
         printf("Number is : %d and cube of the %d is :%d \n",i,i, (i*i*i));
   }
 }
```

11. Write a program in C to display the multiplication table of a given integer
    Test Data :
    Input the number (Table to be calculated) : 15
    Expected Output :
    15 X 1 = 15
    ...

...
15 X 10 = 150

```
#include <stdio.h>
void main()
{
  int j,n;
  printf("Input the number (Table to be calculated) : ");
  scanf("%d",&n);
  printf("\n");
  for(j=1;j<=10;j++)
  {
    printf("%d X %d = %d \n",n,j,n*j);
  }
}
```

12. Write a program in C to display the n terms of odd natural number and their sum .
Test Data
Input number of terms : 10
Expected Output :
The odd numbers are :1 3 5 7 9 11 13 15 17 19
The Sum of odd Natural Number upto 10 terms : 100

```
#include <stdio.h>
void main()
{
  int i,n,sum=0;

  printf("Input number of terms : ");
  scanf("%d",&n);
  printf("\nThe odd numbers are :");
  for(i=1;i<=n;i++)
  {
    printf("%d ",2*i-1);
    sum+=2*i-1;
  }
  printf("\nThe Sum of odd Natural Number upto %d terms : %d \n",n,sum);
}
```

Practice Problems

1. Write a C program to accept two integers and check whether they are equal or not.
2. Write a C program to check whether a given number is even or odd
3. Write a C program to check whether a given number is positive or negative
4. Write a C program to find whether a given year is a leap year or not
5. Write a C program to check whether an alphabet is a vowel or consonant
6. Write a C program to read the age of a candidate and determine whether it is eligible for casting his/her own vote (Eligible age is 18)
7. Write a C program to read roll no, name and marks of three subjects and calculate the total, percentage and division
8. Write a program in C to accept a grade and declare the equivalent description

Grade	**Description**
E	Excellent
V	Very Good
G	Good
A	Average
F	Fail

9. Write a program in C to read any day number in integer and display day name in the word.
10. Write a program in C to read any Month Number in integer and display Month name in the word
11. Write a program in C to display the first 10 natural numbers
12. Write a program in C to read 10 numbers from keyboard and find their sum and average