<u>Assignment</u>

1. Write a C program to display the n terms of odd natural numbers 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

   Sol. #include <stdio.h>

```c
int main()
{
    int n,i,odd,sum;
    printf("Input number of terms");
    scanf("%d",&n);
    printf("The odd numbers are : ");
    for(i=1;i<=n;i++)
    {
        odd=2*i-1;
        printf("%d",odd);
        sum+=odd;
    }
    printf("The sum of odd natural numbers upto \n%d terms : %d\n",n,sum);

    return 0;
}
```

2. Write a program in C to make a pyramid pattern with numbers increased by 1.

```
        1
       2 3
      4 5 6
     7 8 9 10
```

   Sol. #include <stdio.h>

```c
int main()
{
    int n,num=1;
    printf("Enter no. of rows");
    scanf("%d",&n);
    for(int i=1;i<=n;i++)
```

```
    {
       for(int j=1;j<=i;j++)
       {
          printf("%d",num);
          num++;
       }
       printf("\n");
    }
    return 0;
}
```

3. Write a program in C to convert a decimal number into octal without using an array.
Test Data :
Enter a number to convert : 79
Expected Output :
The Octal of 79 is 117.

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

int main()
{
   int decimal_num,quotient,remainder,octal_num=0,place=1;
   printf("enter a no. to convert : ");
   scanf("%d",decimal_num);
   quotient=decimal_num;
   while(quotient>0)
   {
      remainder=quotient%8;
      octal_num+=remainder*place;
      quotient/=8;
      place+=10;
   }
   printf("The octal of %d is %d\n",decimal_num,octal_num);
   return 0;
}
```

4.   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 captured from the keyboard to display the total amount to be paid 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
Surcharge Amount : 240.00
Net Amount Paid By the Customer : 1840.00

Sol. #include <stdio.h>

```
int
main ()
{
  int customerID, unit_consumed;
  char customer_name[100];
float total_amount, surcharge = 0;
  printf ("Enter Customer ID");
  scanf ("%d", &customerID);
  printf ("Enter Customer Name");
  scanf ("%s", &customer_name);
  printf("Enter Unit Consumed");
  scanf("%d",&unit_consumed);
  if(unit_consumed<=199)
  {
    total_amount=unit_consumed*1.20;
  }
  else if(unit_consumed>=200 && unit_consumed<400)
  {
    total_amount=unit_consumed*1.50;
  }
```

```c
      else if(unit_consumed>=400 && unit_consumed<600)
      {
        total_amount=unit_consumed*1.80;
      }
      else
      {
        total_amount=unit_consumed*2.00;
      }
      if(total_amount>400)
      {
        surcharge=total_amount*0.15;
      }
      if(total_amount<100)
      {
        total_amount=100;
      }
      total_amount+=surcharge;
      printf("Customer IDNO : %d\n",customerID);
      printf("Customer Name : %s\n",customer_name);
      printf("Unit Consumed : %d\n",unit_consumed);
      printf("Amount Charges @Rs. %.2f\n per unit :
    %.2f\n",total_amount/unit_consumed,total_amount);
      printf("Surcharge Amount : %.2f\n",surcharge);
      printf("Net Amount Paid by the Customer : %.2f\n",total_amount);
      return 0;
    }
```

5.   C program to find the third angle of a triangle if two angles are given.
Expected Output :
Input two angles of triangle separated by comma : 50,70
Third angle of the triangle : 60

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

int main ()
{
  int angle_1,angle_2,angle_3;
  printf("Input two angles of the triangle separated by a comma : ");
  scanf("%d,%d",&angle_1,&angle_2);
  //Calculate the third angle
  angle_3=180-(angle_1+angle_2);
  printf("Third angle of the triangle : %d\n",angle_3);
  return 0;
}
```

6.   Write a C program to find the sum of an A.P. series.
Test Data :
Input the starting number of the A.P. series: 1
Input the number of items for the A.P. series: 10

Input the common difference of A.P. series: 4
Expected Output :
The Sum of the A.P. series are :
1 + 5 + 9 + 13 + 17 + 21 + 25 + 29 + 33 + 37 = 190

Sol. #include <stdio.h>

```c
int main ()
{
  int start,num_items,common_diff;
  printf("Input the starting no. of the A.P. series : ");
  scanf("%d",&start);
  printf("Input the number of items for the A.P. series : ");
  scanf("%d",&num_items);
  printf("Input the common difference of the A.P. series : ");
  scanf("%d",&common_diff);
  printf("The sum of the A.P. series is : ");
  int sum=0;
  for(int i=0;i<num_items;i++)
  {
     printf("%d",start+i*common_diff);
     sum+=start+i*common_diff;
     if(i<num_items-1)
     {
        printf("+");
     }

  }
  printf(" =%d\n",sum);


  return 0;
}
```

7.   Write a program in C to display a pattern like a diamond.

```
      *
     * * *
    * * * * *
   * * * * * * *
  * * * * * * * * *
   * * * * * * *
    * * * * *
     * * *
      *
```

Sol. #include <stdio.h>

```c
int main ()
{
  int n,i,j,space;
  printf("enter no. of rows(odd) : ");
  scanf("%d",&n);
  if(n%2==0)
  {
     printf("enter an odd no. for diamond pattern \n");
  }
  //Upper half of the diamond
  for(i=1;i<=n;i+=2)
  {
     //print spaces
     for(space=1;space<=(n-i)/2;space++)
     {
        printf(" ");
     }
     //print asterisks
     for(j=1;j<=i;j++)
     {
        printf("*");
     }
     printf("\n");
  }
  //Lower half of the diamond
  for(i=n-2;i>=1;i-=2)
  {
     //print space
     for(space=1;space<=(n-i)/2;space++)
  {
     printf(" ");
  }
  //print asterisks
  for(j=1;j<=i;j++)
  {
   printf("*");
  }
  printf("\n");
  }
  return 0;
}
```