1.Write a C program to print your name, date of birth and mobile number and Name of College using printf() and puts() functions.

```
#include<stdio.h>
int main() {
    printf("\n Mahesh Rokaya");
    puts("\n 2004/10/09");
    printf("\n 9853234934");
    puts("\n Patan Multiple Campus");
    return 0;
}
```

2. Write a C program to display size in bytes of different data types using sizeof() operator.

```
#include<stdio.h>
int main() {
   int num = 7;
   float floatingVal = 7.8;
   double dblVal = 8.009;
   char ch = 'a';
   short shortVal = 100;
   long longVal = 1000000;
   long long longLongVal = 10000000000;
   unsigned int unsignedIntVal = 10;
   _Bool boolValue = 1;
   printf("\nSize in byte of int is : %d", sizeof(num));
   printf("\nSize in bytes of floatingValue: %d", sizeof(floatingVal));
   printf("\nSize in bytes of dblValue: %d", sizeof(dblVal));
   printf("\nSize in bytes of character: %d", sizeof(ch));
   printf("\nSize in bytes of shortValue: %d", sizeof(shortVal));
   printf("\nSize in bytes of longValue: %d", sizeof(longVal));
   printf("\nSize in bytes of longLongValue: %d", sizeof(longLongValue));
   printf("\nSize in bytes of unsignedIntValue: %d", sizeof(unsignedIntVal));
   printf("\nSize in bytes of boolValue: %d", sizeof(boolVal));
   return 0; }
```

3. Write algorithm, flow-chart and program to compute the area and circumference of a circle with given radius r as input defining π as constant.

```
#include<stdio.h>

const float PI=3.1415;

int main(){

   float radius;

   printf("\nEnter the radius of circle:");

   scanf("%f",&radius);

   float area = radius*radius*PI;

   printf("\nThe Area of the circle is :%f", area);

   return 0;

}
```

4. Write a C program to convert specified no of days into years, weeks and days.

```
#include<stdio.h>
int main(){
    int givenDays;
    int years,weeks,days;
    printf("Enter the number of days:");
    scanf("%d",&givenDays);
    years=givenDays/365;
    weeks=(givenDays-(years*365))/7;
    days=givenDays-(years*365)-(weeks*7);
    printf("\nYears: %d",years);
    printf("\nWeeks: %d",weeks);
    printf("\nDays: %d",days);
    return 0;
}
```

5. Write an algorithm and C program that accepts two integers from the user as input and calculates the sum,diference,product,quotient and remainder applying different arithmetic operators between two integers.

CODE :

```
#include<stdio.h>
void main(){
   int num1;
   int num2;
   int sum,diff,pro,quo,rem;
   // taking inputs from user
   printf("Enter a number1: ");
   scanf("%d",&num1);
   printf("Enter a number2: ");
   scanf("%d",&num2);
   // calculating
   sum=num1+num2;
   diff=num1-num2;
   pro=num1*num2;
   quo=num1/num2;
   rem=num1%num2;
   // displaying
   printf("\nsum       : %d",sum);
   printf("\ndiference  : %d",diff);
   printf("\nproduct    : %d",pro);
   printf("\nquotient   : %d",quo);
   printf("\nremainder  : %d",rem);
}
```

ALGORITHM :

Step 1: Start

Step 2: Display “Enter number 1”

Step 3: Read num1

Step 4: Display “Enter number 2”

Step 5: Read num2

Step 6: sum=num1+num2

Step 7: diff=num1-num2

Step 8: pro=num1*num2

Step 9: quo=num1/num2

Step 10: rem=num1%num2

Step 11: Display “sum as sum of num1 and num2”

Step 12: Display “diff as diference of num1 and num2”

Step 13: Display “pro as product of num1 and num2”

Step 14: Display “quo as quotinent of num1 and num2”

Step 15: Display “rem as remainder of num1 and num2”

Step 16: Stop

6. Write algorithm pseudo-code as well as draw flow chart to Compute the roots of the quadratic equation ax2+bx+c =0 for given coefficient input a, b and c. Also, write a C program.

Step 1: Start

Step 2: Display “compare eq with ax^2+bx+c and enter a,b,c”

Step 3: Read a.b.c

Step 4: determinant = b^2-4ac

Step 5: If determinant > 0 then, display “roots are real and distinct” and root1=(-b + sqrt(determinant)) / (2 * a) ,root2=(-b + sqrt(determinant)) / (2 * a) and Display “root1 and root2 as roots of quadratic equation”

Step 6: Else If determinant ==0 then, display “roots are real and equal” and root1=(-b + sqrt(determinant)) / (2 * a) ,root2=(-b + sqrt(determinant)) / (2 * a) and Display “root1 and root2 as roots of quadratic equation”

Step 7: Else display “roots are imaginary” and realPart=-b/(2*a) and imaginaryPart=sqrt(-determinant)/(2*a) and Display“realpart+imaginarypart i and realpart-imaginarypart i as two roots of equation “

Step 8: Stop.

```
#include<stdio.h>

#include<math.h>

void main(){

   float a,b,c,determinant,root1,root2;

   printf("\nCompare the equation to ax^2+bx+c");

   printf("\nEnter the value of a,b,c :");scanf("%f%f
%f",&a,&b,&c);

   determinant=b*b-4*a*c;

   if(determinant==0){

      root1=(-b+sqrt(determinant))/(2*a);

      root2=(-b-sqrt(determinant))/(2*a);

      printf("The roots are real and equal\nroot1:%f\nroot2:
%f",root1,root2);

   }else if (determinant > 0) {

      root1 = (-b + sqrt(determinant)) / (2 * a);

      root2 = (-b - sqrt(determinant)) / (2 * a);

      printf("The roots are real and distinct\nRoot1: %f\
nRoot2: %f",root1,root2);

   }else{

      printf("The roots are imaginary");

      float realPart=-b/(2*a);

      float imaginaryPart=sqrt(-determinant)/(2*a);

  printf("\nroot1: %f+%fi\nroot2: %f-
%fi",realPart,imaginaryPart,realPart,imaginaryPart);

   }}
```

7. Write a C program to check a given integer is positive even, negative even, positiv odd or negative odd.

```
#include <stdio.h>
int main(){
   int num;
   printf("Enter a number : ");
   scanf("%d", &num);
   if (num > 0){
      if (num % 2 == 0){
         printf("\nThe number is positive even");
      }else{
         printf("\nThe number is positive odd");
      }    }
   else if (num < 0){
      if (num % 2 == 0){
         printf("\nThe number is nagative even");
      }else{
         printf("\nThe number is negative odd");
      }
   }else{ printf("number is 0 which neither positive nor negative");
   }
   return 0;
}
```

8. Write a C program to read the score of student and print the grade according to score as:

```
#include<stdio.h>
int main(){
   int score;
   printf("\nEnter the score of the student :");
   scanf("%d",&score);
   if(score>=80){
      printf("\nDistinction");
   }else if(score>=70&&score<80){
      printf("\nFirst Division ");
   }else if(score>=55&&score<70){
      printf("\nSecond Division ");
   } else if(score>=40&&score<55){
      printf("\nThird Division ");
   } else if(score<40)
   printf("\nFail");
   return 0;
}
```

9. Write a C program to find the sum of first 100 natural numbers using loop.

```
#include<stdio.h>
void main(){
   printf("\nProgram to find sum of first 100 Naural Numbers");
   int sum=0;
   for(int i=1;i<=100;i++){
      sum+=i;
   }
   printf("\nThe sum is : %d",sum);
}
```

10. Write a program in C to display the multiplication table of 1 to n where n is input number.

```
#include<stdio.h>
int main(){
   printf("\nProgram to Display Multiplication Table of 1 to n");
   int n;
   printf("\nEnter the value of n:");
   scanf("%d",&n);
   for(int i=1;i<=n;i++){
      printf("\nMultiplication Table of %d",i);
     for(int j=1;j<=10;j++) {
      printf("\n%d * %d = %d",i,j,i*j);
     }
   }
   return 0;
}
```

11. Write algorithm and program to compute factorial of an integer N and a raised to power b using for, do while and while loop separately.

Step 1: Start

Step 2: Read a,b and n

Step 3: initialize fact, power,c1 and c2 to 1

Step 4: fact=fact*c1 and c1=c1+1

Step 5: if c1<=n then goto step 4

Step 6: power=power*a

Step 7: if c2<=b then goto step 6

Step 8: display "fact as factorial of n and power as a raised to b "

Step 9: stop

```c
#include<stdio.h>
int main(){
    int n,a,b,fact=1,pow=1;
    printf("\nEnter n whose factorial is needed: ");
    scanf("%d",&n);
    printf("Enter base and power");
    scanf("%d %d",&a,&b);
    for(int i=1;i<=n;i++){ fact*=i; }
    for(int i=1;i<=b;i++){ pow*=a; }
    printf("Using for loop \nfactorial : %d\npower : %d",fact,pow);
    fact=1;pow=1;
    int i=1,j=1;
    while(i<=n){
        fact*=i; i++;
    }
    while(j<=b){
        pow*=a;
        j++;
    }
    printf("\nUsing While loop\nfactorial : %d\npower : %d",fact,pow);
    fact=1;pow=1,i=1,j=1;
     do{
        fact*=i;
        i++;
    } while(i<=n);
    do {
        pow*=a;
        j++;
    }while(j<=b);
    printf("\n Using Do while loop\nfactorial : %d\npower : %d",fact,pow);
    return 0;
}
```

12. Write a program in C to make such a pattern of astrisk(*) below using loop.

P1 :

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

and

P2:

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

```
#include<stdio.h>
void main(){
   int n;
   printf("\nEnter no. of lines needed: ");
   scanf("%d",&n);
   printf("Pattern 1:\n");
   for(int i=0;i<n;i++){
      for(int j=0;j<=i;j++){
         printf("*");
      }
      printf("\n");
   }
   printf("Pattern 2:\n");
    for (int i = 1; i <= n; i++) {
      for (int space=1;space<=n- i;space++) {
         printf(" ");
      }for (int j = 1; j <= i; j++) {
         printf("* ");
      }
      printf("\n");
   }
}
```

13. Write a program using loop to print the following floyd's triangle as given below when input is n.

1

2 3

4 5 6

7 8 9 10

11 12 13 14 up to n rows

```
#include<stdio.h>
int main(){
   int n,c=1;
   printf("\nEnter no. of lines needed: ");
   scanf("%d",&n);
   printf("Floyd's Triangle:\n");
   for(int i=1;i<=n;i++){
      for(int j=1;j<=i;j++){
         printf("%d ",c);
         c++;
      }
      printf("\n");
   }
   return 0;
}
```

14. Write a program to get input of two 3x3 matrices and find out the sum and product of the matrices and display the result of sum and product.

```
#include<stdio.h>
int main(){
   int a[3][3],b[3][3],sum[3][3],pro[3][3];
   printf("\nInput Matrix A");
   for(int i=0;i<3;i++){
      for(int j=0;j<3;j++){
        scanf("%d",&a[i][j]);
      }  }
   printf("\nInput Matrix B");
   for(int i=0;i<3;i++){
      for(int j=0;j<3;j++){
        scanf("%d",&b[i][j]);
      } }
   printf("\nInput Matrix A");
   for(int i=0;i<3;i++){
      for(int j=0;j<3;j++){
        sum[i][j]=a[i][j]+b[i][j];
        pro[i][j] = 0;
         for(int k = 0; k < 3; k++) {
            pro[i][j] += a[i][k] * b[k][j];
         }     }  }
   printf("\nSum of two matrix is :\n") ;
   for(int i=0;i<3;i++){
      for (int j=0;j<3;j++) { printf("%d   ",sum[i][j]) }
      printf("\n");
   }
   printf("\nProduct of two matrix is :\n") ;
   for (int i=0;i<3;i++) {
      for(int j=0;j<3;j++) { printf("%d   ",pro[i][j]);  }
      printf("\n");
   }
   return 0;
}
```

15. Write a program to get a string as input and print the length of string, reverse of the string.

```
#include<stdio.h>
int stringLen(char str[]);
void revstr(char str[]);
int main(){
   char str[]="hello",originalstr[strlen(str)];
   strcpy(originalstr, str);
   printf("\nReversed : %s",str);
   printf("\nLength : %d",stringLen(originalstr));
   revstr(originalstr);
   return 0;
}

int stringLen(char str[]){
   int j=0;
   while(str[j]!='\0'){
      j++;   }
   return j;
}

void revstr(char str[]){
   int len=stringLen(str);
   for(int i=0;i<len/2;i++){
      char temp=str[i];
      str[i]=str[len-1-i];
      str[len-i-1]=temp;
   }
   printf("\nReversed : %s",str);
}
```

16. Write a program that takes input of two numbers and any one operator in(+,-,*,/ ,%) as input and pass those numbers and an operator to the function. The function should calculate the result of two numbers as indicated by operator and return the result . Display the result of computation in your program.

```
#include<stdio.h>
int cal(int,char,int);
void main(){
   int num1,num2,res;
   char op;
   printf("\nEnter a num1 : ");scanf("%d",&num1);
   printf("Enter operator : ");scanf(" %c",&op);
   printf("Enter a num2 : ");scanf("%d",&num2);
   res=cal(num1,op,num2);
   printf("%d %c %d =%d",num1,op,num2,res);
}
int cal(int num1,char op,int num2){
   int res;
   switch (op) {
   case '+':
      res=num1+num2; break;
    case '-':
      res=num1-num2; break;
    case '*':
      res=num1*num2; break;
    case '/':
      res=num1/num2; break;
    case '%':
      res=num1%num2; break;
   default:
      res=-1;
      printf("invalid operator ");
      break;
   }
   return res;
}
```

17. Write a program defining an array with dynamic memory allocation of integers and compute the sum of the array using function of your own.

```
#include<stdio.h>

#include<stdlib.h>


int sumOfArray(int arr[], int arrLen) {

   int sum = 0;

   for (int i=0; i<arrLen; i++) {

      sum = sum + arr[i];

   }

   return sum;

}

int main() {

   int* ptr;

   int n;

   printf("Enter no. of elements: ");

   scanf("%d", &n);

   ptr = (int*)malloc(n*sizeof(int));

   for(int i =0; i<n; i++) {

      printf("\n ptr[%d] : ", i);

      scanf("%d", &ptr[i]);

   }

   printf("Sum of array = %d", sumOfArray(ptr, n));

   return 0;

}
```

18. Write a program to swap two numbers defining a function swap( ).

```
#include<stdio.h>
void swap(int* a,int* b);
int main(){
   int n1=10,n2=20;
   printf("\nBefore swapping :\n n1= %d \n n2= %d",n1,n2);
   swap(&n1,&n2);// passing reference
   printf("\nAfter swapping :\n n1= %d \n n2= %d",n1,n2);
   return 0;
}
void swap(int* a,int* b){
   int temp=*a;
   *a=*b;
   *b=temp;
}
```

19. Write a program defining a structure to store the data for a student with fields(rollno,f_name, l_name, address, mobileno) , input the data for n students and display the record in appropriate format.

```
#include<stdio.h>

struct student{

   char fName[20];

   char sName[20];

   int rollNo;

   char address[50];

};

void main(){

   int n;

   printf("Enter the number of student :");

   scanf("%d",&n);

   struct student std[n];

   for(int i=0;i<n;i++){

      printf("Enter the details of Student %d",i+1);

      printf("\nEnter first Name , Second Name ,rollno , address");

      scanf("%s%s %d %s",std[i].fName,std[i].sName,&std[i].rollNo,std[i].address);

   }


   for(int i=0;i<n;i++){

      printf("\nDetails of student%d",i+1);

      printf("\nFirst Name: %s\nSecond Name: %s\nRollNO. : %d\n Address:
%s",std[i].fName,std[i].sName,std[i].rollNo,std[i].address);

   }

}
```

20. Write a program to prompt user to input filename and read the content of file and display in screen.

```
#include<stdio.h>
int main(){
   FILE *fp;
   char data[500];
   fp=fopen("ujwalpanday.txt","r");
    if (fp == NULL) {
      printf("Error opening file!\n");
      return 1;
    }
   while(fgets(data, sizeof(data), fp)!=NULL){
      printf("%s",data);
   }
   fclose(fp);
   return 0;
}
```

21. Write a program to read from a text file and count the number of lines and characters in that file.

```
#include <stdio.h>

int main() {
    int spaceCount = 0, charCount = 0;
    FILE *fp;
    char data[500];
    fp = fopen("ujwalpanday.txt", "r");
    if (fp == NULL) {
        printf("Error opening file!\n");
        return 1;
    }
    while (fgets(data, sizeof(data), fp) != NULL) {
        for (int i = 0; data[i] != '\0'; i++) {
            if (data[i] == ' ') {
                spaceCount++;
            } else if (data[i] != '\n') {
                charCount++;
            }
        }
    }
    fclose(fp);
    printf("Number of spaces: %d\n", spaceCount);
    printf("Number of characters: %d\n", charCount);
    return 0;
}
```

22. Write a program to read a text file and copy all contents in the new file.

```
#include <stdio.h>
#include <stdlib.h>
int main() {
    FILE *source_file, *destination_file;
    char source_filename[100], destination_filename[100];
    char ch;

    printf("Enter the source file name: ");
    scanf("%s", source_filename);

    source_file = fopen(source_filename, "r");
    if (source_file == NULL) {
        printf("Error opening source file.\n");
        exit(1);
    }
    printf("Enter the destination file name: ");
    scanf("%s", destination_filename);
    destination_file = fopen(destination_filename, "w");
    if (destination_file == NULL) {
        printf("Error creating destination file.\n");
        fclose(source_file);
        exit(1);
    }
    while ((ch = fgetc(source_file)) != EOF) {
        fputc(ch, destination_file);
    }
    printf("File copied successfully.\n");
    fclose(source_file);
    fclose(destination_file);

    return 0;
}
```