Q1. Write a program to determine the maximum of 3 numbers.

Code:

```c
#include<stdio.h>

void main()
{
        int num1,num2,num3;
        printf("Enter first number:");
        scanf("%d",&num1);
        printf("Enter second number:");
        scanf("%d",&num2);
        printf("Enter third number:");
        scanf("%d",&num3);


        if((num1>num2)&&(num1>num3)){
                printf("%d is the maximum of all three numbers",num1);
        }
        else if((num2>num1)&&(num2>num3)){
                printf("%d is the maximum of all three numbers",num2);
        }
        else{
                printf("%d is the maximum of all three numbers",num3);
        }
}
```

Output:

Enter first number:10

Enter second number:20

Enter third number:30

30 is the maximum of all three numbers

Q2.Write a program to swap the values of two variables

Code:

```c
#include<stdio.h>
void main(){
        int num1,num2,var;
        printf("enter first number");
        scanf("%d",&num1);
        printf("enter second number");
        scanf("%d",&num2);
        printf("Before swapping");
        printf("\nNum1: %d",num1);
        printf("\nNum2: %d",num2);
        var=num1;
        num1=num2;
        num2=var;
        printf("\nAfter swapping");
        printf("\nNum1: %d",num1);
        printf("\nNum2: %d",num2);
}
```

Output:

enter first number24

enter second number78

Before swapping

Num1: 24

Num2: 78

After swapping

Num1: 78

Num2: 24

Q3. Write a program that reads the percentage obtained by the students and determines and prints the class obtained by the students as per the following rules:

Percentage   Class

0-39   Fail

40-59   Second Class

60-79   First Class

80-100   Distinction

Code:

```c
#include<stdio.h>

void main()
{
        int per;
        printf("Enter your percentage");
        scanf("%d",&per);
        if(per>=0 && per<=39){
                printf("Class:Fail");
        }
        else if(per>=40 ||per<=59)
        {
                printf("Class:Second class");
        }
        else if(per>=60 && per<=79)
        {
                printf("Class:First class");
        }
        else if(per>=80 && per<=100)
        {   printf("Class:Distinction");
        }
}
```

Output:

Enter your percentage58

Class:Second class

Q4.Write a program to calculate the area of circle/rectangle/triangle.

C indicate circle,

R indicate rectangle,

T indicate triangle.(use symbolic constant to define the value of pie.)

Code:

```c
#include<stdio.h>
#define PI 3.14159
void main(){
        char ch,c;
        float r,area,l,b,ba,h;
        printf("Press c to calculate area of circle\n ");
        printf("Press r to calculate area of rectangle\n");
        printf("Press t to calculate area of triangle\n");
        printf("Enter choice:");
        scanf("%c",&ch);
        switch(ch){
                case'C':

                        printf("Enter radius of circle\n");
                        scanf("%f",&r);
                        area=PI*r*r;
                        printf("\nArea of circle:%f",area);
                        break;


                case 'R':
                        printf("Enter length of rectangle\n");
                        scanf("%f",&l);
                        printf("Enter width of rectangle\n");
                        scanf("%f",&b);
```

```
                area=l*b;

                        printf("Area of rectangle:%f",area);

                break;


        case 'T':

                printf("Enter base of triangle\n");

                scanf("%f",&ba);

                printf("Enter height of triangle\n");

                scanf("%f",&h);

                area=1/2*ba*h;




        }
}
```

Output:

Press c to calculate area of circle

 Press r to calculate area of rectangle

Press t to calculate area of triangle

Enter choice:C

Enter radius of circle

4

Area of circle:50.265442

Q5. Write a program that accept basic,HRA and DA from the user and calculate total salary.

Code:

```
#include <stdio.h>
void main(){
    float bs,da_per,hra_per,gs,da,hra;
    printf("Enter basic salary:");
    scanf("%f",&bs);
    printf("Enter DA:");
    scanf("%f",&da_per);
    printf("Enter HRA:");
    scanf("%f",&hra_per);


    hra=(hra_per/100)*bs;
    da=(da_per/100)*bs;


    gs=da+hra+bs;
    printf("Gross salary is %.2f",gs);
}
```

Output:

Enter basic salary:15000

Enter DA:5

Enter HRA:10

Gross salary is 17250.00

Q6 Write a program to print multiplication table of a given number

Code:

```c
#include<stdio.h>
void main(){
    int n,i,res;
    printf("Enter the number to print its multiplication table\n");
    scanf("%d",&n);
    for(i=1;i<=10;i++){
        res=n*i;
        printf("%d * %d = %d\n",n,i,res);
    }
}
```

Output:

Enter the number to print its multiplication table

5

5 * 1 = 5

5 * 2 = 10

5 * 3 = 15

5 * 4 = 20

5 * 5 = 25

5 * 6 = 30

5 * 7 = 35

5 * 8 = 40

5 * 9 = 45

5 * 10 = 50

Q7 Write a program to determine given number is prime or not

Code:

```c
#include<stdio.h>
void main(){
    int i,n,f=0;
    printf("Enter a number to check whether it is prime or not:");
    scanf("%d",&n);
    for(i=2;i<n;i++){
        if(n % i==0){
            f=1;
            break;
        }
    }
    if(f==1){
        printf("It is not prime number");
    }
    else{
        printf("It is a prime number");
    }
}
```

Output:

Enter a number to check whether it is prime or not:29

It is a prime number

Q8 Write a program to reverse a given number and display the sum of all digits

Code:

```c
#include<stdio.h>
void main(){
        int n,mod,rev=0,sum=0;
        printf("Enter a number");
        scanf("%d",&n);
        while(n>0){
                mod=n%10;
                rev=rev*10+mod;
                sum+=mod;
                n=n/10;
        }
        printf("\nReverse number is:%d",rev);
        printf("\nSum of all digits is:%d",sum);
}
```

Output:

Enter a number789

Reverse number is:987

Sum of all digits is:24

Q9 Write a program to accept two numbers and perform basic operation of calculater(+,-,*,/).(Use switch case)

Code:

```c
#include<stdio.h>
void main(){
        int num1,num2,res;
        char op;
        printf("Enter first number");
        scanf("%d",&num1);
        printf("\nEnter second number");
        scanf("%d",&num2);
        printf("\nEnter + to perform addition");
        printf("\nEnter - to perform subtraction");
        printf("\nEnter * to perform multiplication");
        printf("\nEnter / to perform division");
        printf("\nEnter operator:");
        scanf(" %c",&op);
        switch(op){
                case '+':
                        res=num1+num2;
                        printf("Sum is %d",res);
                        break;

                case '-':
                        res=num1-num2;
                        printf("Result is %d",res);
                        break;

                case '*':
                        res=num1*num2;
                        printf("Result is %d",res);
```

```
                break;


        case '/':

                res=num1+num2;

                printf("Result is %d",res);

                break;

    }

}
```

Output:

Enter first number15

Enter second number30

Enter + to perform addition

Enter - to perform subtraction

Enter * to perform multiplication

Enter / to perform division

Enter operator:*

Result is 450

Q10 Write a program to find maximum and minimum element from 1-Dimensional array

Code:

```c
#include<stdio.h>
void main(){
    int i, min ,max,n;
    int a[10];
     printf("Enter length of array");
    scanf("%d",&n);
     for(i=0;i<n;i++){
       printf("\nEnter element at[%d] position",i);
       scanf("%d",&a[i]);    }
  min=max=a[0];
   for(i=0;i<n;i++){
      if(a[i]>max){
        max=a[i];       }
      if(a[i]<min){
        min=a[i];
      }
   }
  printf("\nMaximum:%d",max);
   printf("\nMinimum:%d",min);
}
```

Output:

Enter length of array5

Enter element at[0] position24

Enter element at[1] position54

Enter element at[2] position63

Enter element at[3] position14

Enter element at[4] position7

Maximum:63

Minimum:7

Q11 Write a program to sort given array in ascending order.

Code:

```c
#include <stdio.h>
void main() {
  int n,i,j,temp;
  int arr[100];
  printf("Enter the number of elements in the array: ");
  scanf("%d", &n);
  printf("Enter %d elements:\n", n);
  for (i = 0; i < n; i++) {
    scanf("%d", &arr[i]); }
   for (i = 0; i < n - 1; i++) {
    for ( j = 0; j < n - i - 1; j++) {
      if (arr[j] > arr[j + 1]) {
        temp = arr[j];
         arr[j] = arr[j + 1];
         arr[j + 1] = temp; }
     }
  }
 printf("Sorted array in ascending order:\n");
  for (i = 0; i < n; i++) {
    printf("%d ", arr[i]); }
  printf("\n");
}
```

Output:

Enter the number of elements in the array: 5

Enter 5 elements:

78

45

Q12 Write a program to add two matrices

Code:

```c
#include<stdio.h>

void main(){
        int i,j,row,col;
        int a[10][10],b[10][10],c[50][50];
        printf("Enter no of rows for matrices ");
        scanf("%d",&row);
        printf("\nEnter no of cols for matrices ");
        scanf("%d",&col);
        for(i=0;i<row;i++){
                for(j=0;j<col;j++){
                        printf("\nEnter element in first matrix at [%d][%d]:",i,j);
                        scanf("%d",&a[i][j]);   }
        }
        for(i=0;i<row;i++){
                for(j=0;j<col;j++){
                        printf("\nEnter element in second matrix at [%d][%d]:",i,j);
                        scanf("%d",&b[i][j]);}
        }
        for(i=0;i<row;i++)
        {
                for(j=0;j<row;j++)
                { c[i][j]=a[i][j]+b[i][j];   }
        }
        printf("\nFirst Matrix is :\n");
        for(i=0;i<row;i++){
                for(j=0;j<col;j++){
                        printf("%d",a[i][j]);
                        if(j<col-1)printf(",");}
                printf("\n");
```

```
        }
        printf("\nSecond Matrix is :\n");
        for(i=0;i<row;i++){
                for(j=0;j<col;j++){


                        printf("%d",b[i][j]);
                        if(j<col-1)printf(",");


                }
                printf("\n");
        }
        printf("\nNew Matrix is :\n");
        for(i=0;i<row;i++){
                for(j=0;j<col;j++){
                        printf("%d",c[i][j]);
                        if(j<col-1)printf(",");
                }
                printf("\n");
        }
}
```

Output:

Enter no of rows for matrices 2

Enter no of cols for matrices 2

Enter element in first matrix at [0][0]:10

Enter element in first matrix at [0][1]:20

Enter element in first matrix at [1][0]:30

Enter element in first matrix at [1][1]:40

Enter element in second matrix at [0][0]:50

Enter element in second matrix at [0][1]:60

Enter element in second matrix at [1][0]:70

Enter element in second matrix at [1][1]:80

First Matrix is :

10,20

30,40

Second Matrix is :

50,60

70,80

New Matrix is :

60,80

100,120

Q13 Write a program to find element at given position from 2-Dimensional array.

Code:

```c
#include<stdio.h>

void main(){
        int i,j,a[20][20];
        int rpos,cpos,r,c,ele;


        printf("Enter row of array");
        scanf("%d",&c);


        printf("\nEnter column of array");
        scanf("%d",&r);


        for(i=0;i<r;i++)
        {
                for(j=0;j<c;j++)
                {
                        printf("\nEnter element at [%d][%d]",i,j);
                        scanf("%d",&a[i][j]);
                }
        }
        printf("\nEnter the row position ");
        scanf("%d",&rpos);
        printf("\n Enter the column position");
        scanf("%d",&cpos);
        if(rpos<0 || rpos>=r || cpos<0 || cpos>=c){
                printf("Invalid index");


        }
        else{
        ele=a[rpos][cpos];
```

```
        printf("\n Element at [%d][%d] position is:%d",rpos,cpos,ele);

    }


}
```

Output:

Enter row of array2

Enter column of array2

Enter element at [0][0]12

Enter element at [0][1]36

Enter element at [1][0]78

Enter element at [1][1]93

Enter the row position 1

 Enter the column position1

 Element at [1][1] position is:93

Q14 Write a program that will read a text and count all occurrences of a particular character using function.

Code:

```c
#include <stdio.h>

int occur(char text[], char ch) {

    int count = 0;

    int i;

    for (i = 0; text[i] != '\0'; i++) {

        if (text[i] == ch) {

            count++;

        }

    }

    return count;

}

void main() {

    char str[100], ch;

    int count;

    printf("Enter a text: ");

    gets(str);

    printf("Enter the character to count: ");

    scanf(" %c", &ch);

    count = occur(str, ch);



    printf("The character '%c' occurs %d times.", ch, count);

}
```

Output:

Enter a text: PGDCSSSA

Enter the character to count: S

The character 'S' occurs 3 times.

Q15 Write a function which returns 1 if the given number is palindrome otherwise returns 0.

Code:

```c
#include <stdio.h>

int isPalindrome(int num) {
    int org = num;
    int rev = 0,mod;
    while (num > 0) {
        mod = num % 10;
        rev = rev * 10 + mod;
        num /= 10;
    }
    return org == rev ? 1 : 0;
}


int main() {
    int num;
    printf("Enter a number: ");
    scanf("%d", &num);



    if (isPalindrome(num)) {
        printf("%d is a palindrome.\n", num);
    } else {
        printf("%d is not a palindrome.\n", num);
    }


    return 0;
}
```

Output:

Enter a number: 151

151 is a palindrome.

Q16 Write a recursive function for finding the factorial of a number.

Code:

```c
#include<stdio.h>

int factorial(int num)
{
        if(num==1)
        {
                return num;
        }
        else
        {
                return num*factorial(num-1);
        }
}
void main(){
        int n,res;
        printf("Enter value of n");
        scanf("%d",&n);
        res=factorial(n);
        printf("Factorial of %d is:%d",n,res);
}
```

Output:

Enter value of n5

Factorial of 5 is:120

Q17 Write a program to perform summation of all elements of array using pointers.

Code:

```c
#include<stdio.h>
void main(){
        int n,i,sum=0;
        int arr[100];
        int *ptr=arr;
        printf("Enter no of elements");
        scanf("%d",&n);

        for(i=0;i<n;i++){
                printf("Enter integer");
                scanf("%d",ptr+i);
        }
        for(i=0;i<n;i++){
                sum+=*(ptr+i);

        }
        printf("Sum:%d",sum);
}
```

Output:

Enter no of elements5

Enter integer14

Enter integer56

Enter integer3

Enter integer45

Enter integer89

Sum:207

Q18 Write a function using pointers to exchange the value stored in two locations in the memory.

Output:

```
#include <stdio.h>
void swap(int *a, int *b) {
   int temp = *a;
   *a = *b;
   *b = temp;
}
void main() {
   int x, y;

   printf("Enter two integers:\n");
   scanf("%d %d", &x, &y);

   printf("Before swapping: x = %d, y = %d\n", x, y);
   swap(&x, &y);

   printf("After swapping: x = %d, y = %d\n", x, y);
}
```

Output:

Enter two integers:

12

56

Before swapping: x = 12, y = 56

After swapping: x = 56, y = 12

Q19 Write a program to create structure Student with student's roll no, name and marks of three subjects (Maths, Science and English) and display the details of student with total marks of all subjects along with the percentage and passing class in proper format.

Code:

```c
#include<stdio.h>

#include<string.h>

struct Student{

        int rollno;

        char name[15];

        int eng,maths,sci;

        float total,per;

        char passclass[20];

};

void percentage(struct Student* s){

        s->total=s->eng+s->maths+s->sci;

        s->per=s->total/3.0;


        if(s->per>=60){

                strcpy(s->passclass,"First class");

        }

        else if(s->per>=50){

                strcpy(s->passclass,"Second class");

        }

        else if(s->per>=40){

                strcpy(s->passclass,"Third class");

        }


}

void display(struct Student s){

        printf("------Marksheet----------\n");
```

```
        printf("Student rollno:%d\n",s.rollno);

        printf("Student name:%s\n",s.name);

        printf("Maths marks:%d\n",s.maths);

        printf("Maths marks:%d\n",s.sci);

        printf("Maths marks:%d\n",s.eng);

        printf("Maths marks:%f\n",s.per);

        printf("Division:%s\n",s.passclass);

        printf("---------------\n");
}
int main(){
        int n,i;
        printf("Enter the numbe of student:");
        scanf("%d",&n);


        struct Student s[n];


        for(i=0;i<n;i++){
                printf("\nEnter Student rollno:");
                scanf("%d",&s[i].rollno);
                printf("\nEnter Student name:");
                scanf("%s",&s[i].name);
                printf("\nEnter English marks:");
                scanf("%d",&s[i].eng);
                printf("\nEnter Science marks:");
                scanf("%d",&s[i].sci);
                printf("\nEnter Maths marks:");
                scanf("%d",&s[i].maths);
                printf("\n");
                percentage(&s[i]);
```

```
        }
        for(i=0;i<n;i++){
                display(s[i]);
        }
        return 0;
}
```

Output:

Enter the numbe of student:3

Enter Student rollno:1

Enter Student name:Dev

Enter English marks:78

Enter Science marks:80

Enter Maths marks:73

Enter Student rollno:2

Enter Student name:Stuti

Enter English marks:45

Enter Science marks:79

Enter Maths marks:83

Enter Student rollno:3

Enter Student name:Pari

Enter English marks:67

Enter Science marks:71

Enter Maths marks:82

------Marksheet----------

Student rollno:1

Student name:Dev

Maths marks:73

Maths marks:80

Maths marks:78

Maths marks:77.000000

Division:First class

------Marksheet----------

Student rollno:2

Student name:Stuti

Maths marks:83

Maths marks:79

Maths marks:45

Maths marks:69.000000

Division:First class

------Marksheet----------

Student rollno:3

Student name:Pari

Maths marks:82

Maths marks:71

Maths marks:67

Maths marks:73.333336

Division:First class

Q20 Write a program to create structure Time (data members : int h, int m, int sec). Read a value as seconds from user to display new time after adding seconds to Time structure.

Code:

```
#include<stdio.h>

struct Time{

        int h;

        int m;

        int sec;

};

int main(){

        struct Time t;

        int addsec;

        printf("Enter the current time in hours,minutes and seconds:");

        scanf("%d %d %d",&t.h,&t.m,&t.sec);


        printf("Enter seconds to add to current time");

        scanf("%d",&addsec);


        t.sec += addsec;


        t.m +=t.sec/60;

        t.sec=t.sec%60;

        t.h+=t.m/60;

        t.m=t.m%60;


        printf("Updated time is:- %d : %d : %d",t.h,t.m,t.sec);

        return 0;

}
```

Output:

Enter the current time in hours,minutes and seconds:12

5

14

Enter seconds to add to current time564

Updated time is:- 12 : 14 : 38

Q21 Write a program to define a structure called book. Write a program to read information about 5 books and display books details in ascending order of price in proper format.

Code:

```c
#include<stdio.h>

struct Book{


        char name[50];

        char authorname[50];

        int price;

};

void sortbook(struct Book b[]) {

   struct Book temp;

   int i,j;

   for (i = 0; i < 5 - 1; i++) {

      for (j = 0; j < 5 - i - 1; j++) {

         if (b[j].price > b[j + 1].price) {

            temp = b[j];

            b[j] = b[j + 1];

            b[j + 1] = temp;

         }

      }

   }

}

int main(){


        int i;

        struct Book b[5];

        for(i=0;i<5;i++){

                printf("Book No:%d\n",i+1);

                printf("Enter Book name:");
```

```
            scanf("%s",&b[i].name);

            printf("Enter Author name:");

            scanf("%s",&b[i].authorname);

            printf("Enter price");

            scanf("%d",&b[i].price);

      }
      printf("\n");


      sortbook(b);
      for(i=0;i<5;i++){

            printf("\n--------Book Details-----------");

            printf("\nBook name:%s",b[i].name);

            printf("\nAuthor name:%s",b[i].authorname);

            printf("\nPrice:%d",b[i].price);

            printf("\n------------------------------");


      }


      return 0;


}
```

Output:

Book No:1

Enter Book name:maths

Enter Author name:abc

Enter price500

Book No:2

Enter Book name:science

Enter Author name:xyz

Enter price450

Book No:3

Enter Book name:english

Enter Author name:pqr

Enter price300

Book No:4

Enter Book name:economics

Enter Author name:mno

Enter price200

Book No:5

Enter Book name:chemistry

Enter Author name:abc

Enter price340

--------Book Details-----------

Book name:economics

Author name:mno

Price:200

--------Book Details-----------

Book name:english

Author name:pqr

Price:300

--------Book Details-----------

Book name:chemistry

Author name:abc

Price:340

--------Book Details-----------

Book name:science

Author name:xyz

Price:450

--------Book Details-----------

Book name:maths

Author name:abc

Price:500

Q22 Write a program to copy contents of one file to another and also print the no of lines in the first file.

Code:

```
#include<stdio.h>
int main(){
        FILE *f1,*f2;
        char ch;
        int count=1;


        f1=fopen("abc.txt","r");
        if(f1==NULL){
                printf("Error opening file1");
                return 1;
        }


        f2=fopen("xyz.txt","w");
        if(f2==NULL){
                printf("Error opening file2");
                return 1;
        }


        while((ch=fgetc(f1))!= EOF){
                fputc(ch,f2);
                if(ch=='\n'){
                        count++;
                }
        }


        fclose(f1);
        fclose(f2);
```

```
        printf("No of lines in the source file: %d\n",count);

        printf("Content copied successfully");

        return 0;

}
```

abc.txt

A photograph (also known as a photo, image, or picture) is an image created by light falling on a photosensitive surface, usually photographic film or an electronic image sensor, such as a CCD or a CMOS chip. Most photographs are now created using a smartphone or camera, which uses a lens to focus the scene's visible wavelengths of light into a reproduction of what the human eye would see.

The process and practice of creating such images is called photography.

The first permanent photograph, a contact-exposed copy of an engraving, was made in 1822 using the bitumen-based "heliography" process developed by Nicéphore Niépce

Xyz.txt

A photograph (also known as a photo, image, or picture) is an image created by light falling on a photosensitive surface, usually photographic film or an electronic image sensor, such as a CCD or a CMOS chip. Most photographs are now created using a smartphone or camera, which uses a lens to focus the scene's visible wavelengths of light into a reproduction of what the human eye would see.

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The first permanent photograph, a contact-exposed copy of an engraving, was made in 1822 using the bitumen-based "heliography" process developed by Nicéphore Niépce

Output:

No of lines in the source file: 3

Content copied successfully

Q 23 Write a function to read a file and count the no of characters , spaces, newlines and no .of words in a given text file.

Code:

```
#include <stdio.h>

void countFile(const char *filename) {

  FILE *file = fopen(filename, "r");

  char ch;

  int characters = 0, spaces = 0, newlines = 1, words = 0;

  int inWord = 0;


  if (file == NULL) {

    printf("Error opening file.\n");

    return;

  }


  while ((ch = fgetc(file)) != EOF) {

    characters++;


    if (ch == ' ') {

      spaces++;

    } else if (ch == '\n') {

      newlines++;

    }

    if (ch == ' ' || ch == '\n' || ch == '\t') {

      inWord = 0;

    } else {

      if (inWord == 0) {

        inWord = 1;

        words++;

      }
```

```
        }

    }


    fclose(file);

    printf("Number of characters: %d\n", characters);

    printf("Number of spaces: %d\n", spaces);

    printf("Number of newlines: %d\n", newlines);

    printf("Number of words: %d\n", words);

}


int main() {

    const char *filename = "abc.txt";

    countFile(filename);

    return 0;

}
```

Output:

Number of characters: 632

Number of spaces: 101

Number of newlines: 3

Number of words: 103