**SIMPLE C PROGRAMS**

**Assign 1)Accept the radius from user and compute the area and circumference of a circle.**

#include<stdio.h>

int main()

{

    float radius,area,circum;

    printf("enter the radius :");

    scanf("%f",&radius);

    area = 3.1412 \* radius \* radius;

    circum = 2 \* 3.1412 \* radius;

    printf("area = %f\n",area);

    printf("circumference = %f\n",circum);

    return(0);

}

**enter the radius :7**

**area = 153.918793**

**circumference = 43.976799**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_2) Accept a character from user and display ASCII value of it.**

#include <stdio.h>

int main() {

    char c;

    printf("Enter a character: ");

    scanf("%c", &c);

    printf("ASCII value of %c = %d", c, c);

    return (0);

}

**Enter a character: a**

**ASCII value of a = 97**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_3)Accept marks of 5 subjects (out of 100) of a student and display total marks and compute the percentage also.**

#include <stdio.h>

int main()

{

    float sub1, sub2, sub3, sub4, sub5;

float total,percentage;

    printf("Enter marks of five subjects: \n");

    scanf("%f%f%f%f%f", &sub1, &sub2, &sub3, &sub4, &sub5);

    total = sub1 + sub2 + sub3 + sub4 + sub5;

    percentage = (total / 500.0) \* 100;

    printf("Total marks = %.2f\n", total);

    printf("Percentage = %.2f\n", percentage);

    return (0);

}

**Enter marks of five subjects:**

**90**

**85**

**80**

**75**

**70**

**Total marks = 400.00**

**Assign\_4 )Accept the basic salary of an employee and compute the net salary after adding earnings and subtracting deductions. PF is 2 % of basic**

**Tax is 3 % of basic**

**HRA is 5 % basic**

**DA is 8 % of basic**

#include<stdio.h>

int main(){

    float basic\_sal,net\_sal,pf,tax,hra,da;

    printf("enter basic salary of an employee :");

    scanf("%f",&basic\_sal);

    pf = basic\_sal \* 0.02;

    tax =  basic\_sal \* 0.03;

    hra = basic\_sal \* 0.05;

    da = basic\_sal \* 0.08;

    net\_sal = basic\_sal +(hra+da)-(pf+tax);

    printf("net salary after deductions and additions is : %.2f", net\_sal);

    return (0);

}

**enter basic salary of an employee :30000**

**net salary after deductions and additions is : 32400.00**

**Assign\_5)-accept two numbers and swap two numbers using**

* **Third variable**
* **ii) By performing arithmetic operations**

#include <stdio.h>

 int main()

{

//    using third variable

   int a, b, temp;

   printf("Enter two numbers a and b ");

   scanf("%d %d", &a, &b);

   temp = a;

   a = b;

   b = temp;

  printf("\n After swapping \na = %d\nb = %d\n", a, b);

//   using arithmnetic oprations

    a = a + b;

    b = a - b;

    a = a - b;

 printf("\n After swapping using arithmetic operations\na = %d\nb = %d\n", a, b);

  return 0;

**Enter two numbers a and b 5**

**4**

**After swapping**

**a = 4**

**b = 5**

**After swapping using arithmetic operations**

**a = 5**

**b = 4**

**assign\_6 Accept dimensions of a cylinder and print the surface area and volume (Hint: surface area = 2πr 2 + 2πrh, volume = π r 2 h). Define a constant variable pi=3.14.**

#include<stdio.h>

int main(){

    float radius, srfc\_area, hght, volume;

    printf("enter radius of cyllinder :\n");

    scanf("%f", &radius);

    printf("enter height of cyllinder :");

    scanf("%f", &hght);

    srfc\_area = 2\*3.142\*radius\*(radius + hght);

    volume = 3.142\*radius\*radius\*hght;

    printf("surface area of cyllinder : %.2f ", srfc\_area);

    printf("volume of cyllinder : %.2f", volume);

    return(0);

}

**enter radius of cyllinder :**

**4enter height of cyllinder :6surface area of cyllinder : 251.36 volume of cyllinder : 301.63**

**Assign\_7) accept temperatures in Fahrenheit (F) and print it in Celsius(C) and Kelvin (K) (Hint: C=5/9(F-32), K = C + 273.15**

#include<stdio.h>

int main(){

float frnht, celsius, kelvin;

printf("enter tempratures in f :");

scanf("%f",&frnht);

celsius = ((frnht-32)\*5/9);

kelvin = celsius + 273.15;

printf("temprature of farenhite to celsius is : %.2f \n", celsius);

printf("temprature of farenhite to kelvin is : %.2fk", kelvin);

return (0);

}

**enter tempratures in f :50**

**temprature of farenhite to celsius is : 10.00**

**temprature of farenhite to kelvin is : 283.15k**

**PS D:\iacsd assignments pre\_cdac>**

**If - else**

**Assign\_10)Write a program to accept an integer and check if it is even or odd.**

#include<stdio.h>

int main(){

int num;

printf("Enter an integer: ");

scanf("%d", &num);

if(num % 2 == 0)

printf("%d is even.", num);

else

printf("%d is odd.", num);

return (0);

}

**Enter an integer: 5**

**5 is odd.**

**assign\_2)Write a program to accept a number and check if it is divisible by 5 and 7**

#include<stdio.h>

int main()

{

int num,f,m;

printf("\nEnter a number ");

scanf("%d",&num);

if(num%5==0)

{

f=1;

}

if(num%7==0)

{

m=1;

}

if(f==1 && m==1)

{

printf("\nThe number %d is divisible by 5 and 7",num);

}

else if(f==1)

{

printf("\nThe number %d is divisible by 5 but not by 7",num);

}

else if(m==1)

{

printf("\nThe number %d is divisible by 7 but not by 5",num);

}

else

{

printf("\nThe number %d is neither divisible by 5 nor by 7",num);

}

return (0);

}

**Enter a number 35**

**The number 35 is divisible by 5 and 7**

**Assign\_3)Write a program, which accepts annual basic salary of an employee and calculates and displays the**

**Income tax as per the following rules.**

**Basic: < 1, 50,000 Tax = 0**

**1, 50,000 to 3,00,000 Tax = 20%**

**> 3,00,000 Tax = 30%**

#include<stdio.h>

#include<math.h>

#include<conio.h>

int main()

{

float salary,tax;

printf("enter the emp basic salary :");

scanf("%f",&salary);

if(salary<=150000)

{

tax=0;

printf("tax = %f",tax);

}

else if(salary>150000 && salary<=300000)

{

tax=(salary\*0.2);

printf("tax = %f",tax);

}

else if(salary>300000)

{

tax=(salary\*0.3);

printf("tax = %f",tax);

}

return (0)

;}

**enter the emp basic salary :155000**

**tax = 31000.000000**

**Assign\_4)**

**Accept a lowercase character from the user and check whether the character is a vowel or consonant.**

**(Hint: a, e, i, o, u are vowels)**

#include <stdio.h>

int main() {

char c;

int lowercase\_vowel;

printf("Enter an alphabet: ");

scanf("%c", &c);

lowercase\_vowel = (c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u');

if (lowercase\_vowel)

printf("%c is a vowel.", c);

else

printf("%c is a consonant.", c);

return (0);

}

**Enter an alphabet: a**

**a is a vowel.**

**assign \_5)Write a C program to input angles of a triangle and check whether triangle is valid or not.**

#include<stdio.h>

int main()

{

    float A,B,C,Tot;

    printf("\nEnter the three values of angles A,B,C\n");

    scanf("\n%f\n%f\n%f",&A,&B,&C);

    Tot = A+B+C;

    if(Tot==180)

    {

        printf("it is a triangle");

    }

    else

    {

        printf("it is not a triangle");

    }

}

**Enter the three values of angles A,B,C**

**50**

**60**

**70**

**it is a triangle**

**Assign\_6) Write a C program to check whether a entered character is uppercase or lowercase alphabet.**

#include<conio.h>

int main()

{

char c;

int i;

printf("Enter a Character: ");

scanf("%c", &c);

i=c;

if(i<=90)

{

printf("it is a uppercase");

}

else

{

printf("it is a lowercase");

}

}

**Enter a Character: A**

**it is a uppercase**

**Assign\_7)**

**Write a C program to accept a character and invert the case of it**

#include<stdio.h>

#include<conio.h>

int main()

{

char c;

int i;

printf("Enter a Character: ");

scanf("%c",&c);

i=c;

if(i<=90)

{

i=i+32;

c=i;

printf("lowercase=%c\n",c);

}

if(i<=122)

{

i=i-32;

c=i;

printf("Uppercase=%c",c);

}

return 0;

}

**Enter a Character: a**

**Uppercase=A**

**Assign\_8) Write a program to accept 3 numbers and compute minimum and maximum from them.**

#include<stdio.h>

#include<stdio.h>

#include<conio.h>

int main()

{

int a,b,c,big;

printf("Enter three numbers:");

scanf("\n%d\n%d\n%d",&a,&b,&c);

if(a>b)

{

if(b>c)

big=a;

else

{

if(c>a)

big=c;

else

big=a;

}

}

else

{

if(b>c)

big=b;

else

big= c;

}

printf("\nLargest number=%d",big);

getch();

return 0;

}

**Enter three numbers:20**

**10**

**30**

**Largest number=30**

**SWITCH\_CASE**

**Assign\_1)**

**Accept a single digit from the user and display it in words. For example, if digit entered is 9, display Nine.**

#include <stdio.h>

int main()

{

   int digit;

   printf("Input Digit(0-9) : ");

   scanf("%d",&digit);

   switch(digit)

   {

     case 0:

           printf("Zero\n");

           break;

     case 1:

           printf("one\n");

           break;

    case 2:

           printf("Two\n");

           break;

    case 3:

           printf("Three\n");

           break;

    case 4:

           printf("Four\n");

           break;

    case 5:

           printf("Five\n");

           break;

    case 6:

           printf("Six\n");

           break;

    case 7:

           printf("Seven\n");

           break;

    case 8:

           printf("Eight\n");

           break;

    case 9:

           printf("Nine\n");

           break;

    default:

           printf("invalid digit. \nPlease try again ....\n");

           break;

      }

}

**PS D:\iacsd assignments pre\_cdac> cd "d:\iacsd assignments pre\_cdac\" ; if ($?) { gcc switch\_1.c -o switch\_1 } ; if ($?) { .\switch\_1 }**

**Input Digit(0-9) : 9**

**Nine**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_2) Write a program, which accepts two integers and an operator as a character (+ - \* / ), performs the corresponding operation and displays the result**

#include<stdio.h>

int main()

{

  int a,b,res;

  char c;

  printf ("Enter any one operator +, -, \*, /,\n");

  scanf("%c", &c);

  printf ("\n Enter two numbers \n");

  scanf ("\n %d \n %d",&a, &b);

  switch(c)

  {

    case '+': res=a+b;

    printf("\n The sum is %d",res);

    break;

    case '-': res=a-b;

    printf("\n The difference is %d",res);

    break;

    case '\*': res=a\*b;

    printf("\n The product is %d",res);

    break;

    case '/': res=a/b;

    printf("\n The quotient is %d",res);

    break;

    default: printf ("\n Invalid entry");

  }

  return 0;

}

**Enter any one operator+,-,\*,**

**-**

**Enter two numbers**

**5**

**3**

**The difference is 2**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_3) Accept two numbers in variables x and y from the user and perform the following operations Options Actions**

**1. Equality Check if x is equal to y**

**2. Less Than Check if x is less than y**

**3. Quotient and Remainder Divide x by y and display the quotient and remainder**

**4. Range : Accept a number and check if it lies between x and y (both inclusive)**

**5. Swap : Interchange x and y**

#include<stdio.h>

int main()

{

int a,b;

float quo,rem;

float x;

int t;

printf("Enter any two numbers ");

scanf("\n%d\n%d",&a, &b);

switch(1)

{

case 1:

printf("1st case\n");

if(a==b){

printf("equal\n");

}

else{

printf("not equal\n");

}

case 2:

printf("2nd case\n");

if(a<b)

{

printf("x is less than y\n");

}

else{

printf("x is not less than y\n");

}

case 3:

printf("3rd case\n");

quo= a/b;

rem=a%b;

printf("\nQuotint=%f\nRemainder=%f\n",quo, rem);

case 4:

printf("4th case\n");

printf("enter a number :");

scanf("%f",&x);

if(x<a && x<b)

{

printf("does not lie between the numbers\n");

}

else

{

printf("lies between the numbers\n");

}

case 5:

printf("5th case\n");

printf("numbers before swapping : \n%d\n%d",a,b);

t=a;

a=b;

b=t;

printf("numbers after swapping : \n%d\n%d",a,b);

break;

return 0;

}

}

**PS D:\iacsd assignments pre\_cdac> cd "d:\iacsd assignments pre\_cdac\" ; if ($?) { gcc switch\_3.c -o switch\_3 } ; if ($?) { .\switch\_3 }**

**Enter any two numbers 5**

**4**

**1st case**

**not equal**

**2nd case**

**x is not less than y**

**3rd case**

**Quotint=1.000000**

**Remainder=1.000000**

**4th case**

**5**

**lies between the numbers**

**5th case**

**numbers before swapping :**

**5**

**4numbers after swapping :**

**4**

**5**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_4) Accept radius from the user and write a program having menu with the following options and**

**corresponding actions:**

**Options Actions**

**1. Area of Circle**

**2. Circumference of Circle**

**3. Volume of Sphere**

#include<stdio.h>

int main()

{

int c;

float r,A,C,V;

printf("1. Area of circle\n2. Circumference of circle\n3. Volume of sphere.\n");

printf("Enter your choice : ");

scanf("%d",&c);

switch(c)

{

case 1:

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

scanf("%f", &r);

A = 3.14 \* r \* r;

printf("\nArea of Circle : %f",A);

break;

case 2:

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

scanf("%f", &r);

C = 2 \* 3.14 \* r;

printf("\nCircumference of Circle: %f ",C);

break;

case 3:

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

scanf("%f", &r);

V = (4/3) \* 3.14 \* r \* r \* r;

printf("\nVolume of the Sphere is : %f",V);

break;

default: printf ("\nInvalid entry");

}

return (0);

}

**output :**

**1. Area of circle**

**2. Circumference of circle**

**3. Volume of sphere.**

**Enter your choice : 2**

**Enter the radius of Circle : 5**

**Circumference of Circle: 31.400000**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_5) Write a program having menu that has three options - add, subtract or multiply two fractions. The two**

**fractions and the options are taken as input and the result is displayed as output. Each fraction is read as**

**two integers, numerator and denominator.**

#include<stdio.h>

int main()

{

int a,b,c,d,ch,nu,de;

printf("enter 1 st fraction \nnumerator:");

scanf("%d",&a);

printf("denominator:");

scanf("%d",&b);

printf("enter 2 nd fraction \nnumerator:");

scanf("%d",&c);

printf("denominator:");

scanf("%d",&d);

printf("1.add\n2.sub\n3.mul :");

scanf("%d",&ch);

switch(ch)

{

case 1:nu=(a\*d)+(c\*b);

de=(b\*d);

printf("add is %d/%d",nu,de);

break;

case 2:nu=(a\*d)-(c\*b);

de=(b\*d);

printf("sub is %d/%d",nu,de);

break;

case 3:nu=(a\*c);

de=(b\*d);

printf("mul is %d/%d",nu,de);

break;

}

return (0);

}

**output:**

**enter 1 st fraction**

**numerator:5**

**denominator:10**

**enter 2 nd fraction**

**numerator:15**

**denominator:25**

**1.add**

**2.sub**

**3.mul :3**

**mul is 75/250**

**PS D:\iacsd assignments pre\_cdac>**

**LOOPS**

**Assign\_1)rite a program that accepts numbers continuously as long as the number is positive and prints the sum of the given numbers**

#include<stdio.h>

int main()

{

int num,sum=0;

printf("Enter Postive numbers to sum:");

while(1)

{

scanf("%d",&num);

if(num<0)

{

break;

}

sum=sum+num;

}

printf("positive numbers sum : %d",sum);

return 0;

}

**output :**

**Enter Postive numbers to sum:1**

**2**

**2**

**3**

**4**

**-1**

**positive numbers sum : 10**

**Assign\_2) Write a program to accept two integers x and n and compute x raised to n.**

**#include <stdio.h>**

#include <math.h>

void main()

{

long int x,n,pow=1,j=1;

printf("Enter the values of X and n : ");

scanf("%d %d",&x,&n);

pow=x;

while(n!=j)

{

pow=pow\*x;

j++;

}

printf(" %d to the power %d = %d",x,n,pow);

}

**output:**

**Enter the values of X and n : 2**

**2**

**2 to the power 2 = 4**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_3) Write a program to accept a character, an integer n and display the next n characters.**

#include<stdio.h>

int main()

{

int n,j=1;

char a;

printf("enter char :");

scanf("%c",&a);

printf("enter limit :");

scanf("%d",&n);

while(j<=n)

{

a=a+1;

if(a=='z' || a=='Z')

{

printf("large limit\n");

j=n;

}

else

printf("%c\t",a);

j++;

}

}

**output :**

**enter char :a**

**enter limit :5**

**b c d e f**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_4) Write a program to calculate factorial of a number.**

**For e.g. factorial of 5 = 5! = 5 \*4\*3\*2\*1 = 120**

**#include<stdio.h>**

int main(){

int x,fact=1,n;

printf("Enter a number to find factorial: ");

scanf("%d",&n);

for(x=1;x<=n;x++)

fact=fact\*x;

printf("Factorial of %d is: %d",n,fact);

return 0;

}

**output:**

**Enter a number to find factorial: 5**

**Factorial of 5 is: 120**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_5) Write a program to calculate factors of a given number.**

#include <stdio.h>

int main() {

int num, i;

printf("Enter a positive integer: ");

scanf("%d", &num);

printf("Factors of %d are: ", num);

for (i = 1; i <= num; ++i) {

if (num % i == 0) {

printf("%d ", i);

}

}

return 0;

}

**output:**

**Enter a positive integer: 5**

**Factors of 5 are: 1 5**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_6) Accept two numbers and calculate GCD of them.**

#include <stdio.h>

int main()

{

int n1, n2, i, gcd;

printf("Enter two integers: ");

scanf("%d %d", &n1, &n2);

for(i=1; i <= n1 && i <= n2; ++i)

{

if(n1%i==0 && n2%i==0)

gcd = i;

}

printf("G.C.D of %d and %d is %d", n1, n2, gcd);

return 0;

}

**output:**

**Enter two integers: 5**

**4**

**G.C.D of 5 and 4 is 1**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_7)Write a menu driven program to do following operations :**

**a) Compute area of circle**

**b) Compute area of rectangle**

**c) Compute area of triangle**

**d) Exit**

**Display menu, ask choice to the user, depending on choice accept the parameters and perform the**

**operation. Continue this process until user selects exit option.**

#include<stdio.h>

void main ()

{

int choice,r,l,w,b,h;

float area;

printf("Input 1 for area of circle\n");

printf("Input 2 for area of rectangle\n");

printf("Input 3 for area of triangle\n");

printf("Input your choice : ");

scanf("%d",&choice);

switch(choice)

{

case 1:

printf("Input radious of the circle : ");

scanf("%d",&r);

area=3.14\*r\*r;

break;

case 2:

printf("Input length and width of the rectangle : ");

scanf("%d%d",&l,&w);

area=l\*w;

break;

case 3:

printf("Input the base and hight of the triangle :");

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

area=.5\*b\*h;

break;

}

printf("The area is : %f\n",area);

}

**output:**

**Input 1 for area of circle**

**Input 2 for area of rectangle**

**Input 3 for area of triangle**

**Input your choice : 3**

**Input the base and hight of the triangle :5**

**6**

**The area is : 15.000000**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_8)Write a program to print all prime numbers between 1 to n.**

#include<stdio.h>

void main(){

int i, num, n, count;

printf("Enter the range: \n");

scanf("%d", &n);

printf("The prime numbers in between the range 1 to %d:",n);

for(num = 1;num<=n;num++){

count = 0;

for(i=2;i<=num/2;i++){

if(num%i==0){

count++;

break;

}

}

if(count==0 && num!= 1)

printf("%d ",num);

}

}

**output:**

**Enter the range:**

**5**

**The prime numbers in between the range 1 to 5:2 3 5**

**PS D:\iacsd assignments pre\_cdac>**

**1\_D ARRAY**

**Assign\_1)Write a program to accept n numbers in an array and display the largest and smallest number. Using**

**these values, calculate the range of elements in the array.**

#include<stdio.h>

int main()

{

int a[50],i,n,large,small;

printf("\nEnter the number of elements : ");

scanf("%d",&n);

printf("\nInput the array elements : ");

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

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

large=small=a[0];

for(i=1;i<n;++i)

{

if(a[i]>large)

large=a[i];

if(a[i]<small)

small=a[i];

}

printf("\nThe smallest element is %d\n",small);

printf("\nThe largest element is %d\n",large);

return 0;

}

**output:**

**Enter the number of elements : 5**

**Input the array elements : 10**

**15**

**20**

**25**

**30**

**The smallest element is 10**

**The largest element is 30**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_2)**

**Write a program to accept an array of n elements and a number say key. Check whether key is present**

**in the array or not.**

#include <stdio.h>

#include <conio.h>

int search(int \*a,int n,int key)

{

int i;

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

{

if(a[i]==key)

{

return 1;

}

}

return 0;

}

int main()

{

int a[10000],i,n,key;

printf("Enter size of the array : ");

scanf("%d", &n);

printf("Enter elements in array : ");

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

{

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

}

printf("Enter the key : ");

scanf("%d", &key);

if(search(a,n,key))

printf("element found ");

else

printf("element not found ");

}

**output:**

**Enter size of the array : 5**

**Enter elements in array : 10**

**20**

**30**

**40**

**50**

**Enter the key : 30**

**element found**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_3)Write a program to accept an integer array and an integer say num and counts the occurrences of the num in the array.**

#include<stdio.h>

int main()

{

int n,i,j,c,a[20],t,num;

printf("/\*How Many Numbers You Want\nTo Add in Array\*/\n\nEnter Limit : ");

scanf("%d",&n);

printf("\nEnter %d Numbers:\n\n",n);

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

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

/\* To sort all entered element in ascending order\*/

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

{

for(j=i+1;j<n;j++)

{

if(a[i]>a[j])

{

t=a[i];

a[i]=a[j];

a[j]=t;

}

}

}

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

printf("\nNumber\t Frequency of Occurrence");

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

for(i=0;i<n;i=j)

{

num=a[i];

c=1;

for(j=i+1;j<n;j++)

{

if(a[j]!=num)

break;

else

c++;

}

printf("\n%d\t\t%d",num,c);

}

return 0;

}

**output:**

**/\*How Many Numbers You Want**

**To Add in Array\*/**

**Enter Limit : 5**

**Enter 5 Numbers:**

**10**

**20**

**30**

**40**

**50**

**--------------------------------**

**Number Frequency of Occurrence**

**--------------------------------**

**10 1**

**20 1**

**30 1**

**40 1**

**50 1**

**PS D:\iacsd assignments pre\_cdac>**

**Asign\_4)Write a program to accept n numbers from the user and store them in an array. Then sort the array in descending order and display it.**

#include <stdio.h>

void main ()

{

int number[30];

int i, j, a, n;

printf("Enter the value of N\n");

scanf("%d", &n);

printf("Enter the numbers \n");

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

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

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

{

for (j = i + 1; j < n; ++j)

{

if (number[i] < number[j])

{

a = number[i];

number[i] = number[j];

number[j] = a;

}

}

}

printf("The numbers arranged in descending order are given below\n");

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

{

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

}

}

**output:**

**Enter the value of N**

**5**

**Enter the numbers**

**10**

**12**

**14**

**16**

**18**

**The numbers arranged in descending order are given below**

**18**

**16**

**14**

**12**

**10**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_5)5Write a program to accept a decimal number and convert it to binary.**

#include<stdio.h>

#include<stdlib.h>

int main(){

int a[10],n,i;

system ("cls");

printf("Enter the number to convert: ");

scanf("%d",&n);

for(i=0;n>0;i++)

{

a[i]=n%2;

n=n/2;

}

printf("\nBinary of Given Number is=");

for(i=i-1;i>=0;i--)

{

printf("%d",a[i]);

}

return 0;

}

**output:**

**Enter the number to convert: 10**

**Binary of Given Number is=1010**

**PS D:\iacsd assignments pre\_cdac>**

**2D\_ARRAY**

**Assign\_1) Write a program to accept, display and print the sum of elements of each row and sum of elements of each column of a matrix.**

#include <stdio.h>

void main ()

{

static int array[10][10];

int i, j, m, n, sum = 0;

printf("Enter the order of the matrix\n");

scanf("%d %d", &m, &n);

printf("Enter the co-efficients of the matrix\n");

for (i = 0; i < m; ++i)

{

for (j = 0; j < n; ++j)

{

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

}

}

for (i = 0; i < m; ++i)

{

for (j = 0; j < n; ++j)

{

sum = sum + array[i][j] ;

}

printf("Sum of the %d row is = %d\n", i, sum);

sum = 0;

}

sum = 0;

for (j = 0; j < n; ++j)

{

for (i = 0; i < m; ++i)

{

sum = sum + array[i][j];

}

printf("Sum of the %d column is = %d\n", j, sum);

sum = 0;

}

}

**output:**

**Enter the order of the matrix**

**2**

**4**

**Enter the co-efficients of the matrix**

**6**

**8**

**10**

**12**

**14**

**16**

**18**

**20**

**Sum of the 0 row is = 36**

**Sum of the 1 row is = 68**

**Sum of the 0 column is = 20**

**Sum of the 1 column is = 24**

**Sum of the 2 column is = 28**

**Sum of the 3 column is = 32**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_2)2Write a program to accept a matrix A of size mXn and store its transpose in matrix B. Display matrix B.**

#include <stdio.h>

void main()

{

static int array[10][10];

int i, j, m, n;

printf("Enter the order of the matrix \n");

scanf("%d %d", &m, &n);

printf("Enter the coeficients of the matrix\n");

for (i = 0; i < m; ++i)

{

for (j = 0; j < n; ++j)

{

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

}

}

printf("The given matrix is \n");

for (i = 0; i < m; ++i)

{

for (j = 0; j < n; ++j)

{

printf(" %d", array[i][j]);

}

printf("\n");

}

printf("Transpose of matrix is \n");

for (j = 0; j < n; ++j)

{

for (i = 0; i < m; ++i)

{

printf(" %d", array[i][j]);

}

printf("\n");

}

}

**output:**

**nter the order of the matrix**

**2**

**2**

**Enter the coeficients of the matrix**

**10**

**20**

**30**

**40**

**The given matrix is**

**10 20**

**30 40**

**Transpose of matrix is**

**10 30**

**20 40**

**PS D:\iacsd assignments pre\_cdac>**

**Assign\_3)**

**Write a program to add and multiply two matrices. Perform necessary checks before adding and multiplying the matrices.**

#include<stdio.h>

#include<conio.h>

void main()

{

int a[3][3], b[3][3], c[3][3]={0}, d[3][3]={0};

int i,j,k,m,n,p,q;

printf("Enter no. of rows and columns in matrix A: ");

scanf("%d%d",&m,&n);

printf("Enter no. of rows and columns in matrix B: ");

scanf("%d%d",&p,&q);

if(m!=p || n!=q)

{

printf("Matrix Addition is not possible");

return;

}

else if(n!=p)

{

printf("Matrix Multiplication is not possible");

return;

}

else

{

printf("Enter elements of matrix A: ");

for(i=0;i<m;i++)

for(j=0;j<n;j++)

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

printf("Enter elements of matrix B: ");

for(i=0;i<p;i++)

for(j=0;j<q;j++)

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

//Matrix Addition

for(i=0;i<m;i++)

for(j=0;j<n;j++)

c[i][j] = a[i][j] + b[i][j];

printf("\nResult of Matirx Addition:\n");

for(i=0;i<m;i++)

{

for(j=0;j<n;j++)

printf("%d ", c[i][j]);

printf("\n");

}

//Matrix Multiplication

for(i=0;i<m;i++)

for(j=0;j<q;j++)

for(k=0;k<p;k++)

d[i][j] += a[i][k]\*b[k][j];

printf("\nResult of Matirx Multiplication:\n");

for(i=0;i<m;i++)

{

for(j=0;j<q;j++)

printf("%d ", d[i][j]);

printf("\n");

}

}

getch();

}

**output:**

**Enter no. of rows and columns in matrix A: 2**

**2**

**Enter no. of rows and columns in matrix B: 2**

**2**

**Enter elements of matrix A: 10**

**20**

**30**

**40**

**Enter elements of matrix B: 1**

**2**

**3**

**4**

**Result of Matirx Addition:**

**11 22**

**33 44**

**Result of Matirx Multiplication:**

**70 100**

**150 220**

**Assign\_4)Write a program to perform the following operations on a square matrix. Write**

**i) Check if the matrix is symmetric.**

**ii) Display the trace of the matrix (sum of diagonal elements).**

**iii) Check if the matrix is an upper triangular matrix.**

#include<stdio.h>

void sym();

void trace();

void uptri();

void lowtri();

void ide();

void main()

{

int ch;

printf("1.Check if the matrix is symmetric\n2.Display the trace of the matrix (sum of diagonal elements)\n3.Check if the matrix is an upper triangular matrix\n4.Check if the matrix is a lower triangular matrix\n5.Check if it is an identity matrix\n ");

printf("Enter your choice: ");

scanf("%d",&ch);

switch(ch)

{

case 1:

sym();

break;

case 2:

trace();

break;

case 3:

uptri();

break;

case 4:

lowtri();

break;

case 5:

ide();

break;

}

}

void sym()

{

int m, n, c, d, matrix[10][10], transpose[10][10];

printf("Enter the number of rows and columns of matrix\n");

scanf("%d%d", &m, &n);

printf("Enter an elements of the matrix \n");

for (c = 0; c < m; c++)

for (d = 0; d < n; d++)

scanf("%d", &matrix[c][d]);

for (c = 0; c < m; c++)

for (d = 0; d < n; d++)

transpose[d][c] = matrix[c][d];

if (m == n)

{

for (c = 0; c < m; c++)

{

for (d = 0; d < m; d++)

{

if (matrix[c][d] != transpose[c][d])

break;

}

if (d != m)

break;

}

if (c == m)

printf("The matrix is symmetric.\n");

else

printf("The matrix isn't symmetric.\n");

}

else

printf("The matrix isn't symmetric.\n");

}

void trace()

{

int a[10][10],i,j,sum=0,m,n;

printf("Enter the values of m,n: ");

scanf("%d%d",&m,&n);

printf("Enter the elements of matrix : ");

for(i=0;i<m;i++)

for(j=0;j<n;j++)

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

for(i=0;i<m;i++)

for(j=0;j<n;j++)

if(i==j)

sum=sum+a[i][j];

printf("Trace of a matrix= %d\n",sum);

}

void uptri()

{

int array[10][10];

int row, col, isUpper,MAX\_COLS,MAX\_ROWS;

printf("enter how many row:(row = col):");

scanf("%d",&MAX\_ROWS);

MAX\_COLS=MAX\_ROWS;

printf("Enter elements in matrix of size %dx%d: \n", MAX\_ROWS, MAX\_COLS);

for(row=0; row<MAX\_ROWS; row++)

{

for(col=0; col<MAX\_COLS; col++)

{

scanf("%d", &array[row][col]);

}

}

isUpper = 1;

for(row=0; row<MAX\_ROWS; row++)

{

for(col=0; col<MAX\_COLS; col++)

{

if(col<row && array[row][col]!=0)

{

isUpper = 0;

}

}

}

if(isUpper == 1)

{

printf("\nThe matrix is Upper triangular matrix.\n");

for(row=0; row<MAX\_ROWS; row++)

{

for(col=0; col<MAX\_COLS; col++)

{

printf("%d ", array[row][col]);

}

printf("\n");

}

}

else

{

printf("\nThe matrix is not Upper triangular matrix.");

}

}

void lowtri()

{

int array[10][10];

int row, col, isLower,MAX\_COLS,MAX\_ROWS;

printf("enter how many row:(row = col):");

scanf("%d",&MAX\_ROWS);

MAX\_COLS=MAX\_ROWS;

printf("Enter elements in matrix of size %dx%d: \n", MAX\_ROWS, MAX\_COLS);

for(row=0; row<MAX\_ROWS; row++)

{

for(col=0; col<MAX\_COLS; col++)

{

scanf("%d", &array[row][col]);

}

}

isLower = 1;

for(row=0; row<MAX\_ROWS; row++)

{

for(col=0; col<MAX\_COLS; col++)

{

if(col>row && array[row][col]!=0)

{

isLower = 0;

}

}

}

if(isLower == 1)

{

printf("\nMatrix is Lower triangular matrix: \n");

for(row=0; row<MAX\_ROWS; row++)

{

for(col=0; col<MAX\_COLS; col++)

{

printf("%d ", array[row][col]);

}

printf("\n");

}

}

else

{

printf("\nMatrix is not a Lower triangular matrix");

}

}

void ide()

{

int i, j, rows, columns, a[10][10], Flag = 1;

printf("\n Please Enter Number of rows and columns : ");

scanf("%d %d", &i, &j);

printf("\n Please Enter the Matrix Elements \n");

for(rows = 0; rows < i; rows++)

{

for(columns = 0; columns < j; columns++)

{

scanf("%d", &a[rows][columns]);

}

}

for(rows = 0; rows < i; rows++)

{

for(columns = 0; columns < j; columns++)

{

if(a[rows][columns] != 1 && a[columns][rows] != 0)

{

Flag = 0;

break;

}

}

}

if(Flag == 1)

{

printf("\n The Matrix that you entered is an Identity Matrix ");

}

else

{

printf("\n The Matrix that you entered is Not an Identity Matrix ");

}

}

**output:**

**1.Check if the matrix is symmetric**

**2.Display the trace of the matrix (sum of diagonal elements)**

**3.Check if the matrix is an upper triangular matrix**

**4.Check if the matrix is a lower triangular matrix**

**5.Check if it is an identity matrix**

**Enter your choice: 3**

**enter how many row:(row = col):2**

**Enter elements in matrix of size 2x2:**

**10**

**20**

**90**

**100**

**The matrix is not Upper triangular matrix.**

**PS D:\iacsd assignments pre\_cdac>**

**STRING**