***CPP LAB ASSIGNMENT***

Question 01:-to find given number is even or odd?

#include<iostream>

using namespace std;

int main(){

    int a;

    cout<<"enter any number";

    cin>>a;

    if(a%2==0){

        cout<<"number is even"<<a;

    }

    else{

        cout<<"number is odd"<<a;

    }

    return 0;

}

Question 02:- to find given number is prime or composite ?

#include<iostream>

using namespace std;

int main(){

    int n;

    int isprime=1;

    cout<<"enter any number";

    cin>>n;

    for(int i=2;i\*i<n;i++){

        if(n%i==0){

        isprime=0;

        }

    }

    if(isprime){

        cout<<"n is prime";

    }

    else{

        cout<<" n is composite";

    }

    return 0;

    }

Question 03:-to print given number of table upto n multiple?

#include<iostream>

using namespace std;

int main(){

int a,n;

cout<<"enter the value of a";

cin>>a;

cout<<"enter the value of n that upto which number you want multiple of your table ";

cin>>n;

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

    cout<<a<<"\*"<<i<<"="<<a\*i<<"\n";

}

return 0;

}

Question 04 a:-to find greatest of two number?

#include<iostream>

using namespace std;

int main(){

    int a,b;

    cout<<"enter two number";

    cin>>a>>b;

    if(a>b){

        cout<<"a is greater than b";

    }

    else {

        cout<<"b is greater than a";

    }

    return 0;

}

Question 04 b :-to find greatest among three number ?

Question 04 b:- to find greatest of three number?  
#include<iostream>

using namespace std;

int main(){

    int a,b,c;

    cout<<"enter three number";

    cin>>a>>b>>c;

    if(a>b){

        if(a>c){

            cout<<"a is greatest among all";

        }

        else{

            cout<<"c is greatest among all";

        }

    }

    else if(b>a){

        if(b>c){

            cout<<"b is greatest among all";

        }

        else {

            cout<<"c is greatest among all";

        }

    }

    return 0;

}

Question 05:- to find sum of first n natural number ?

#include<iostream>

using namespace std;

int main(){

    int n;

    int sum =0;

    cout<<"enter any number";

    cin>>n;

    for(int i=1;i<=n;i++){

        sum =sum +i;

    }

    cout<<sum;

    return 0;

}

Question 06 :- to find factorial of given number?

#include<iostream>

using namespace std;

int main(){

    int n;

    int product=1;

    cout<<"enter any number";

    cin>>n;

    for(int i=n;i>1;i--){

        product=product \*i;

    }

    cout<<product;

    return 0;

}

Question 07 :-to find sum of digits of n digits number?

#include<iostream>

using namespace std;

int main(){

    int n;

    int sum =0;

    cout<<"enter any number";

    cin>>n;

    while( n!=0){

        sum=sum+n%10;

        n=n/10;

    }

    cout<<sum;

    return 0;

}

Question 08:- to find reverse of a number ?

#include<iostream>

using namespace std;

int main(){

    int n;

    int reverse=0;

    cout<<"enter any number";

    cin>>n;

    while(n!=0){

        reverse=reverse\*10+n%10;

        n=n/10;

    }

    cout<<reverse;

    return 0;

}

Question 09:-to find given number is palindrome or not?

#include<iostream>

using namespace std;

int main(){

    int number,reverse=0,originalnumber,i;

    cout<<"enter any number";

    cin>>number;

    originalnumber=number;

    while(number!=0){

reverse=reverse\*10+number%10;

number=number/10;

    }

    if(reverse==originalnumber){

        cout<<"number is palidrome";

    }

    else {

        cout<<"number is not palidrome";

    }

    return 0;

}

Question 10:-to find Fibonacci series upto n terms?

#include <iostream>

using namespace std;

int main() {

    int n;

    int a = 0, b = 1, nextTerm;

    cout << "Enter the number of terms: ";

    cin >> n;

    if (n <= 0) {

        cout << "Please enter a positive integer.";

    } else {

        cout << "Fibonacci series up to " << n << " terms:\n";

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

            cout << a << " ";

            nextTerm = a + b;

            a = b;

            b = nextTerm;

        }

    }

    return 0;

}

Question 11:-to find given number is Armstrong or not?

#include<iostream>

#include<cmath>

using namespace std;

int main(){

    int n,originalnumber,remainder,number=0,counter=0;

    cout<<"enter the number";

    cin>>n;

    originalnumber=n;

    //counting the number of digits

    int temp=n;

    while(temp!=0){

        temp=temp/10;

        ++counter;

    }

   // cout<<counter<<endl;

    temp=originalnumber;

    while(temp!=0){

        remainder=temp%10;

        number=number+pow(remainder,counter);

        temp=temp/10;

    }

    if(number==originalnumber){

        cout<<"number is armstrong";

    }

    else{

        cout<<"number is not armstrong";

    }

    return 0;

}

Question 12:-print all even number between 100 to 200?

#include<iostream>

using namespace std;

int main(){

    for(int i=100;i<=200;i++){

        if(i%2==0){

            cout<<i<<endl;

        }

    }

    return 0;

}

Question 13:- to find first 50 prime number?

#include <iostream>

using namespace std;

bool isPrime(int num) {

    if (num <= 1)

        return false;

    for (int i = 2; i \* i <= num; ++i) {

        if (num % i == 0)

            return false;

    }

    return true;

}

int main() {

    int count = 0;

    int num = 2; // Start from the first prime number

    cout << "First 50 prime numbers are:\n";

    while (count < 50) {

        if (isPrime(num)) {

            cout << num << " ";

            count++;

        }

        num++;

    }

    cout << endl;

    return 0;

}

Question 14:-print all four digit Armstrong number?

#include <iostream>

using namespace std;

int main()

{

    int a;             // Temporary variable to hold the current number for manipulation

    int number = 0;    // To store the sum of the fourth powers of digits

    int originalnumber;

    // Loop through all 4-digit numbers

    for (int i = 1000; i <= 9999; i++)

    {

        a = i;                    // Set 'a' to the current number

        originalnumber = i;       // Save the original number for comparison

        number = 0;               // Reset sum for each number

        // Calculate the sum of the fourth powers of its digits

        while (a != 0)

        {

            int remainder = a % 10;

            number += (remainder \* remainder \* remainder \* remainder);

            a /= 10;

        }

        // Check if it is an Armstrong number

        if (number == originalnumber)

        {

            cout << originalnumber << " is an Armstrong number" << endl;

        }

    }

    return 0;

}

Question 15:- pattern

#include<iostream>

using namespace std;

int main()

{

    int rows;

    cout<<"enter number of rows";

    cin>>rows;

    for(int i=1;i<=rows;i++){

        for(int j=1;j<=i;j++){

            cout<<"\*";

        }

        cout<<endl;

    }

    return 0;

}

#include<iostream>

using namespace std;

int main(){

    int rows;

    cout<<"enter the number of rows";

    cin>>rows;

    for(int i=rows;i>=1;i--){

        for(int j=1;j<=i;j++){

            cout<<"\*";

        }

        cout<<endl;

    }

    return 0;

}

#include<iostream>

using namespace std;

int main(){

    int rows;

    cout<<"enter the number of rows";

    cin>>rows;

    for(int i=1;i<=rows;i++){

        for(int j=1;j<=rows-i;j++){

            cout<<" ";

        }

        for(int k=1;k<=2\*i-1;k++){

cout<<"\*";

        }

        cout<<endl;

    }

    return 0;

}

#include <iostream>

using namespace std;

int main() {

    int rows, i, j, num;

    cout << "Enter the number of rows for Pascal's Triangle: ";

    cin >> rows;

    for (i = 0; i < rows; i++) {

        num = 1;  // First number in each row is always 1

        // Print spaces for alignment

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

            cout << "  ";

        }

        // Print Pascal's Triangle numbers

        for (j = 0; j <= i; j++) {

            cout << num << "   ";  // Add spaces between numbers for better formatting

            num = num \* (i - j) / (j + 1);  // Calculate next number in the row

        }

        cout << "\n";

    }

    return 0;

}

#include <iostream>

using namespace std;

int main() {

    int rows, num = 1;

    cout << "Enter the number of rows: ";

    cin >> rows;

    for (int i = 1; i <= rows; i++) {

        for (int j = 1; j <= i; j++) {

            cout << num << " ";

            ++num;

        }

        cout << endl;

    }

    return 0;

}

Question 16:- to print all palindrome between 500 to 1000?

#include <iostream>

using namespace std;

int main() {

    int number, reverse, originalnumber;

    for (int i = 500; i <= 1000; i++) {

        number = i;             // Assign the current number to "number"

        originalnumber = i;     // Store the original number

        reverse = 0;            // Reset reverse for each number

        // Reverse the number

        while (number != 0) {

            reverse = reverse \* 10 + number % 10;

            number = number / 10;

        }

        // Check if it's a palindrome

        if (reverse == originalnumber) {

            cout << originalnumber << " is a palindrome" << endl;

        } else {

            cout << originalnumber << " is not a palindrome" << endl;

        }

    }

    return 0;

}

Question 16:- to print first 100 odd number?

#include <iostream>

using namespace std;

int main() {

    int count = 0;   // Counter for how many odd numbers printed

    int number = 1;  // Starting number (first odd number)

    cout << "The first 100 odd numbers are:" << endl;

    while (count < 100) {

        cout << number << " ";

        number += 2;   // Move to the next odd number

        count++;

    }

    cout << endl;

    return 0;

}

Question 16:-convert decimal to binary ,octal,hexadecimal?

#include <iostream>

using namespace std;

// Function to convert decimal to binary

void decimalToBinary(int num) {

    int binary[32];  // Array to store binary digits

    int i = 0;

    if (num == 0) {

        cout << "0";

        return;

    }

    while (num > 0) {

        binary[i] = num % 2;

        num = num / 2;

        i++;

    }

    cout << "Binary: ";

    // Print in reverse order

    for (int j = i - 1; j >= 0; j--) {

        cout << binary[j];

    }

    cout << endl;

}

// Function to convert decimal to octal

void decimalToOctal(int num) {

    int octal[32];  // Array to store octal digits

    int i = 0;

    if (num == 0) {

        cout << "0";

        return;

    }

    while (num > 0) {

        octal[i] = num % 8;

        num = num / 8;

        i++;

    }

    cout << "Octal: ";

    // Print in reverse order

    for (int j = i - 1; j >= 0; j--) {

        cout << octal[j];

    }

    cout << endl;

}

// Function to convert decimal to hexadecimal

void decimalToHexadecimal(int num) {

    char hex[32];  // Array to store hex digits

    int i = 0;

    if (num == 0) {

        cout << "0";

        return;

    }

    while (num > 0) {

        int remainder = num % 16;

        if (remainder < 10)

            hex[i] = remainder + '0';  // Convert to char '0'-'9'

        else

            hex[i] = remainder - 10 + 'A';  // Convert to char 'A'-'F'

        num = num / 16;

        i++;

    }

    cout << "Hexadecimal: ";

    // Print in reverse order

    for (int j = i - 1; j >= 0; j--) {

        cout << hex[j];

    }

    cout << endl;

}

int main() {

    int decimalNumber;

    cout << "Enter a decimal number: ";

    cin >> decimalNumber;

    cout << endl;

    decimalToBinary(decimalNumber);

    decimalToOctal(decimalNumber);

    decimalToHexadecimal(decimalNumber);

    return 0;

}

Question 16:-to find geometrical sum upto n terms?

#include <iostream>

#include <cmath> // For pow()

using namespace std;

double geometricSum(double a, double r, int n) {

    double sum = 0;

    for (int i = 0; i < n; i++) {

        sum += a \* pow(r, i); // Adds each term: a \* r^i

    }

    return sum;

}

int main() {

    double a, r;

    int n;

    // Input values from user

    cout << "Enter first term (a): ";

    cin >> a;

    cout << "Enter common ratio (r): ";

    cin >> r;

    cout << "Enter number of terms (n): ";

    cin >> n;

    double result = geometricSum(a, r, n);

    cout << "Geometric sum up to " << n << " terms is: " << result << endl;

    return 0;

}

Question 18:- to calculate the average of all elements in 1d array?

#include <iostream>

using namespace std;

int main()

{

    int sum = 0;

    int arr[5];

    cout << "enter any five number";

    for (int i = 0; i < 5; i++)

    {

        cin >> arr[i];

        sum = (sum + arr[i]);

    }

    int average = sum / 5;

    cout << average;

    return 0;

}y

Question 19:- to find maximum and minimum value in 1d array?

#include <iostream>

using namespace std;

int main()

{

    int arr[5];

    int i = 0;

    cout << "enter any 5 elements of array";

    for (i = 0; i < 5; i++)

    {

        cin >> arr[i];

    }

    int max = arr[0];

    for (i = 0; i < 5; i++)

    {

        if (max < arr[i])

        {

            max = arr[i];

        }

    }

    cout << max;

    return 0;

}

#include <iostream>

using namespace std;

int main()

{

    int i = 0;

    int arr[7];

    cout << "enter any 7 number";

    for (i = 0; i < 7; i++)

    {

        cin >>arr[i];

    }

    int min = arr[0];

    for (i = 0; i < 7; i++)

    {

        if (min > arr[i])

        {

            min = arr[i];

        }

    }

    cout << min;

    return 0;

}

Question 20:- find transpose of given 2d array?

#include <iostream>

using namespace std;

int main() {

    int rows, cols;

    // Input matrix dimensions

    cout << "Enter the number of rows and columns: ";

    cin >> rows >> cols;

    // Declare matrices (assuming modern C++ allows dynamic size with VLA or use std::vector for better practice)

    int matrix[rows][cols];

    int transpose[cols][rows];

    // Input matrix elements

    cout << "Enter the elements of the matrix:\n";

    for (int i = 0; i < rows; i++) {

        for (int j = 0; j < cols; j++) {

            cin >> matrix[i][j];

        }

    }

    // Compute the transpose

    for (int i = 0; i < rows; i++) {

        for (int j = 0; j < cols; j++) {

            transpose[j][i] = matrix[i][j];

        }

    }

    // Display the transpose

    cout << "Transpose of the matrix:\n";

    for (int i = 0; i < cols; i++) {

        for (int j = 0; j < rows; j++) {

            cout << transpose[i][j] << " ";

        }

        cout << endl;

    }

    return 0;

}

Question 21:- to add two matrices?

#include <iostream>

using namespace std;

int main() {

    int arr[2][2] = {1, 2, 3, 4};

    int brr[2][2] = {5, 6, 7, 8};

    cout << endl;

    int res[2][2];

    // Adding two 2D arrays

    for (int i = 0; i < 2; i++) {

        for (int j = 0; j < 2; j++) {

            res[i][j] = arr[i][j] + brr[i][j];

        }

    }

    // Displaying the result

    for (int i = 0; i < 2; i++) {

        for (int j = 0; j < 2; j++) {

            cout << res[i][j] << " ";

        }

        cout << endl;

    }

    return 0;

}

Question 22:- to multiply 2d matrices?

#include <iostream>

using namespace std;

#define MAX 100  // Maximum size of the matrix

int main() {

    int n;

    // Input size of square matrices

    cout << "Enter the size of the square matrices (n x n): ";

    cin >> n;

    int A[MAX][MAX], B[MAX][MAX], C[MAX][MAX];

    // Input elements of Matrix A

    cout << "Enter elements of Matrix A:" << endl;

    for (int i = 0; i < n; i++) {

        for (int j = 0; j < n; j++) {

            cin >> A[i][j];

        }

    }

    // Input elements of Matrix B

    cout << "Enter elements of Matrix B:" << endl;

    for (int i = 0; i < n; i++) {

        for (int j = 0; j < n; j++) {

            cin >> B[i][j];

        }

    }

    // Initialize Matrix C to 0

    for (int i = 0; i < n; i++) {

        for (int j = 0; j < n; j++) {

            C[i][j] = 0;

        }

    }

    // Matrix multiplication: C = A \* B

    for (int i = 0; i < n; i++) {

        for (int j = 0; j < n; j++) {

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

                C[i][j] += A[i][k] \* B[k][j];

            }

        }

    }

    // Print the result matrix C

    cout << "Resultant Matrix C (A x B):" << endl;

    for (int i = 0; i < n; i++) {

        for (int j = 0; j < n; j++) {

            cout << C[i][j] << " ";

        }

     return 0;

    }

Question 28:- Define a class called Car with attributes such as make, model, and year. Include member functions to set and get these attributes. Create an object of the Car class and demonstrate the use of its member functions

#include <iostream>

using namespace std;

class car

{

    string make;

    string model;

    int year;

public:

    void setdata()

    {

        cout << "enter the manufacturing company and the model and year of manufacturing " << endl;

        cin >> make >> model >> year;

    }

    void getdata()

    {

        cout << "the manfacturing company is:" << make << "the model " << model << "the year of manufacturing :" << year << endl;

    }

};

int main()

{

    car myCar;

    myCar.setdata();

    myCar.getdata();

    return 0;

}

Question 29:- Define a class called Address with attributes such as street, city, and zipCode. Create a class called Person that has an Address object as a member variable. Demonstrate composition by creating a Person object and accessing its Address attributes

#include<iostream>

using namespace std;

class address{

    string street;

    string city;

    int zipcode;

    public:

    void setdata(){

        cout<<"enter the user address"<<endl;

        cin>>street>>city>>zipcode;

    }

    void getdata(){

        cout<<"the street of user is :"<<street<<"the city of user is :"<<city<<"the zipcode is:"<<zipcode<<endl;

    }

};

int main(){

    address p1;

    p1.setdata();

    p1.getdata();

    return 0;

}

Question 31:- Define a class student with the following specification  
**Private members** of class student  
admno integer  
sname 20 character  
eng. math, science float  
total float  
**Public member** function of class student

ctotal() a function to calculate eng + math + science with float return type.  
Takedata() Function to accept values for admno, sname, eng, science Showdata() Function to display all the data members on the screen

#include<iostream>

using namespace std;

class student{

    int admissionnumber;

    string studentname;

    float english;

    float maths;

    float science;

    float total;

    public:

    void takedata(){

        cout<<"enter student admission number ,name ,marks of english maths and science"<<endl;

        cin>>admissionnumber>>studentname>>english>>maths>>science;

    }

    void showdata(){

        cout<<admissionnumber<<studentname<<english<<maths<<science<<endl;

    }

    void totalnum(){

        cout<<english+maths+science;

    }

};

int main(){

    student s1;

    s1.takedata();

    s1.showdata();

    s1.totalnum();

    return 0;

}

Question 32:- Define a class in C++ with following description:  
**Private Members**  
A data member Flight number of type integer  
A data member Destination of type string  
A data member Distance of type float  
A data member Fuel of type float  
A member function CALFUEL() to calculate the value of Fuel as per the following criteria  
 Distance Fuel  
 <=1000 500  
 more than 1000 and <=2000 1100  
 more than 2000 2200  
**Public Members**  
A function FEEDINFO() to allow user to enter values for Flight Number, Destination, Distance & call function CALFUEL() to calculate the quantity of Fuel.  
A function SHOWINFO() to allow user to view the content of all the data members.

#include <iostream>

#include <string>

using namespace std;

class Flight {

private:

    int flightNumber;

    string destination;

    float distance;

    float fuel;

    // Member function to calculate fuel

    void calFuel() {

        if (distance <= 1000) {

            fuel = 500;

        } else if (distance > 1000 && distance <= 2000) {

            fuel = 1100;

        } else {

            fuel = 2200;

        }

    }

public:

    // Function to feed information

    void feedInfo() {

        cout << "Enter flight number: ";

        cin >> flightNumber;

        cout << "Enter destination: ";

        cin.ignore(); // Ignore newline character

        getline(cin, destination);

        cout << "Enter distance: ";

        cin >> distance;

        calFuel(); // Calculate fuel

    }

    // Function to show information

    void showInfo() {

        cout << "Flight Number: " << flightNumber << endl;

        cout << "Destination: " << destination << endl;

        cout << "Distance: " << distance << endl;

        cout << "Fuel: " << fuel << endl;

    }

};

int main() {

    Flight flight;

    flight.feedInfo();

    flight.showInfo();

    return 0;

}

Question 33:-**. Write a menu driven program to perform following:**

1. **Input a matrix**
2. **Display matrix**
3. **Add two matrix**
4. **Multiply two matrix**
5. **Transpose a matrix**

#include <iostream>

using namespace std;

const int MAX = 10; // Maximum size of the matrix

// Function to input a matrix

void inputMatrix(int mat[MAX][MAX], int rows, int cols) {

    cout << "Enter elements of the matrix " << rows << "x" << cols << ":\n";

    for (int i = 0; i < rows; i++)

        for (int j = 0; j < cols; j++)

            cin >> mat[i][j];

}

// Function to display a matrix

void displayMatrix(int mat[MAX][MAX], int rows, int cols) {

    cout << "Matrix:\n";

    for (int i = 0; i < rows; i++) {

        for (int j = 0; j < cols; j++)

            cout << mat[i][j] << " ";

        cout << endl;

    }

}

// Function to add two matrices

void addMatrix(int mat1[MAX][MAX], int mat2[MAX][MAX], int res[MAX][MAX], int rows, int cols) {

    for (int i = 0; i < rows; i++)

        for (int j = 0; j < cols; j++)

            res[i][j] = mat1[i][j] + mat2[i][j];

}

// Function to multiply two matrices

void multiplyMatrix(int mat1[MAX][MAX], int mat2[MAX][MAX], int res[MAX][MAX], int r1, int c1, int c2) {

    for (int i = 0; i < r1; i++) {

        for (int j = 0; j < c2; j++) {

            res[i][j] = 0;

            for (int k = 0; k < c1; k++)

                res[i][j] += mat1[i][k] \* mat2[k][j];

        }

    }

}

// Function to transpose a matrix

void transposeMatrix(int mat[MAX][MAX], int res[MAX][MAX], int rows, int cols) {

    for (int i = 0; i < rows; i++)

        for (int j = 0; j < cols; j++)

            res[j][i] = mat[i][j];

}

int main() {

    int mat1[MAX][MAX], mat2[MAX][MAX], res[MAX][MAX];

    int r1 = 0, c1 = 0, r2 = 0, c2 = 0;

    int choice;

    do {

        cout << "\n===== Menu =====\n";

        cout << "1. Input a matrix\n";

        cout << "2. Display matrix\n";

        cout << "3. Add two matrices\n";

        cout << "4. Multiply two matrices\n";

        cout << "5. Transpose a matrix\n";

        cout << "6. Exit\n";

        cout << "Enter your choice: ";

        cin >> choice;

        switch (choice) {

            case 1:

                cout << "Enter rows and columns of matrix: ";

                cin >> r1 >> c1;

                if (r1 > MAX || c1 > MAX || r1 <= 0 || c1 <= 0) {

                    cout << "Invalid matrix size!\n";

                    break;

                }

                inputMatrix(mat1, r1, c1);

                break;

            case 2:

                if (r1 == 0 || c1 == 0) {

                    cout << "No matrix to display. Please input a matrix first.\n";

                } else {

                    displayMatrix(mat1, r1, c1);

                }

                break;

            case 3:

                cout << "Enter rows and columns of both matrices (must be same for addition): ";

                cin >> r1 >> c1;

                if (r1 > MAX || c1 > MAX || r1 <= 0 || c1 <= 0) {

                    cout << "Invalid matrix size!\n";

                    break;

                }

                inputMatrix(mat1, r1, c1);

                inputMatrix(mat2, r1, c1);

                addMatrix(mat1, mat2, res, r1, c1);

                cout << "Result of Addition:\n";

                displayMatrix(res, r1, c1);

                break;

            case 4:

                cout << "Enter rows and columns of first matrix: ";

                cin >> r1 >> c1;

                cout << "Enter rows and columns of second matrix: ";

                cin >> r2 >> c2;

                if (r1 > MAX || c1 > MAX || r2 > MAX || c2 > MAX ||

                    r1 <= 0 || c1 <= 0 || r2 <= 0 || c2 <= 0) {

                    cout << "Invalid matrix size!\n";

                    break;

                }

                if (c1 != r2) {

                    cout << "Matrix multiplication not possible! Columns of first matrix must equal rows of second.\n";

                    break;

                }

                inputMatrix(mat1, r1, c1);

                inputMatrix(mat2, r2, c2);

                multiplyMatrix(mat1, mat2, res, r1, c1, c2);

                cout << "Result of Multiplication:\n";

                displayMatrix(res, r1, c2);

                break;

            case 5:

                cout << "Enter rows and columns of matrix: ";

                cin >> r1 >> c1;

                if (r1 > MAX || c1 > MAX || r1 <= 0 || c1 <= 0) {

                    cout << "Invalid matrix size!\n";

                    break;

                }

                inputMatrix(mat1, r1, c1);

                transposeMatrix(mat1, res, r1, c1);

                cout << "Transpose of the Matrix:\n";

                displayMatrix(res, c1, r1);

                break;

            case 6:

                cout << "Exiting program. Goodbye!\n";

                break;

            default:

                cout << "Invalid choice! Please try again.\n";

        }

    } while (choice != 6);

    return 0;

}

Question 23:- to sort an array in ascending order?

#include<iostream>

using namespace std;

int main (){

    int n;

    cout<<"enter the size of array";

    cin>>n;

    int arr[n];

    cout<<"enter the elements of array";

    for(int i=0;i<n;i++){

        cin>>arr[i];

    }

    for(int i=0;i<n;i++){

        for(int j=i+1;j<n;j++){

            if(arr[i]>arr[j]){

                int temp=arr[i];

                arr[i]=arr[j];

                arr[j]=temp;

            }

        }

    }

    cout<<"sorted array elements are";

    for(int i=0;i<n;i++){

        cout<<arr[i]<<" ";

    }

    return 0;

}

Question 24:-to reverse a given string?

#include<iostream>

#include<algorithm>

using namespace std;

int main(){

    string str;

    cout<<"enter the string ";

    cin>>str;

    reverse(str.begin(),str.end());

    cout<<"reverse string "<<str<<endl;

    return 0;

}

Question 25:-to count all vowels in given string?

#include <iostream>

#include <string>

using namespace std;

int main() {

    string str;

    int count = 0;

    string vowels = "";

    cout << "Enter a string: ";

    cin>>str;

    for (int i = 0; i < str.length(); i++) {

        char ch = str[i];

        // Check if it's a vowel

        if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u') {

            count++;

            // Check if this vowel is already added

            if (vowels.find(ch) == string::npos) {//it returns string::npos (which means "not found").

                vowels += ch;

            }

        }

    }

    cout << "Total vowels: " << count << endl;

    cout << "Vowels in the string: " << vowels << endl;

    return 0;

}

Question 26:- to check whether the given string is palindrome ?

#include<iostream>

#include<algorithm>

using namespace std;

int main() {

    string str, originalstr;

    cout << "Enter the string: ";

    cin >> str;

    originalstr = str;

    reverse(str.begin(), str.end());

    if (str == originalstr) {

        cout << "String is palindrome";

    }

    else {

        cout << "String is not palindrome";

    }

    return 0;

}

Question 27:- to check whether the given string is anagram or not?

#include <iostream>

#include <algorithm>

using namespace std;

int main()

{

    string str1, str2;

    cout << "enter first string";

    cin >> str1;

    cout << "enter second string";

    cin >> str2;

    if (str1.length() != str2.length())

    {

        cout << "not anagram";

        return 0;

    }

    sort(str1.begin(), str1.end());

    sort(str2.begin(), str2.end());

    if (str1 == str2)

    {

        cout << "anagram";

    }

    else

    {

        cout << "not anagram";

    }

    return 0;

}

//question 17 ( i ) : Write a program to print binary number for a decimal number

using recursion

#include<iostream>

using namespace std;

void decimalToBinary(int n) {

 if (n > 0) {

 decimalToBinary(n / 2);

 cout << (n % 2);

 }

}

int main() {

 int num;

 cout << "Enter a decimal number: ";

 cin >> num;

 if (num == 0)

 cout << "0";

 else

 decimalToBinary(num);

 return 0;

}

//question 17 ( ii ) : Write a program to print octal number for a decimal number

using recursion

#include<iostream>

using namespace std;

void decimalToOctal(int n) {

 if (n > 0) {

 decimalToOctal(n / 8);

 cout << (n % 8);

 }

}

int main() {

 int num;

 cout << "Enter a decimal number: ";

 cin >> num;

 if (num == 0)

 cout << "0";

 else

 decimalToOctal(num);

 return 0;

}

//question 17 ( iii ) : Write a program to print factorial for a given range using

recursion

#include<iostream>

using namespace std;

int factorial(int n) {

 if (n == 0 || n == 1) {

 return 1;

 }

 return n \* factorial(n - 1);

}

int main() {

 int start, end;

 cout << "Enter the starting number: ";

 cin >> start;

 cout << "Enter the ending number: ";

 cin >> end;

 for (int i = start; i <= end; i++) {

 cout << "Factorial of " << i << " is: " << factorial(i) << endl;

 }

 return 0;

}

//question 17 ( iv ) : Write a program to print first n terms of fibonacci series using

recursion

#include<iostream>

using namespace std;

int fib(int n){

 if (n==1)

 {

 return 1;

 }

 if (n==0)

 {

 return 0;

 }

 int fibNm1=fib(n-1);

 int fibNm2=fib(n-2);

 int fibN=fibNm1+fibNm2;

 return fibN;

}

int main(){

 int num;

 cout<<"enter the number of term : ";

 cin>>num;

 cout<<"fibonacci series from 0 to "<<num<<" term : ";

 for (int i = 0; i<num; i++)

 {

 cout<<fib(i)<< " ";

 }

 return 0;

}

/\*Question 30 : Write a program to display the minimum, maximum,

 sum, search and average of elements of an array.\*/

#include <iostream>

using namespace std;

int main() {

 int n, searchElement, min, max, sum = 0;

 float avg;

 cout << "Enter the number of elements: ";

 cin >> n;

 int arr[n];

 cout << "Enter " << n << " elements: ";

 for (int i = 0; i < n; i++) {

 cin >> arr[i];

 sum += arr[i];

 }

min = max = arr[0];

 for (int i = 1; i < n; i++) {

 if (arr[i] < min)

 min = arr[i];

 if (arr[i] > max)

 max = arr[i];

 }

 avg = (float)sum / n;

 cout << "Enter element to search: ";

 cin >> searchElement;

 bool found = false;

 for (int i = 0; i < n; i++) {

 if (arr[i] == searchElement) {

 found = true;

 break;

 }

 }

 cout << "Minimum element: " << min << endl;

 cout << "Maximum element: " << max << endl;

 cout << "Sum of elements: " << sum << endl;

 cout << "Average of elements: " << avg << endl;

 if (found)

 cout << "Element " << searchElement << " is present in the array." << endl;

 else

 cout << "Element " << searchElement << " is not found in the array." << endl;

 return 0;