```
//Question 1:write a program to find given number is even or odd
#include<iostream>
using namespace std;
int main(){
        int n;
                cout<<"enter any number: ";
                cin>>n;
        if(n%2==0)
                cout<<n<<" is even number."<<endl;
        else
                cout<<n<<" is odd number."<<endl;
        return 0;
   }
//question 2:write a program to find given number is prime or composite
#include<iostream>
using namespace std;
int main(){
    int n,c=0;
                cout<<"Enter any number: ";
                cin>>n;
        if(n<2){
                cout<<n<<" is neither prime nor composite.\n";
                return 0;
        }
        for(int i=1;i<=n;i++){
                if(n%i==0){
                        c++;
                }}
        if(c==2){
                cout<<n<<" is a prime number.\n";
        }
        else{
```

```
            cout<<n<<" is a composite number.\n";
        }

        return 0;
}
//question 3:write a program to print table of a given number upto n multiple
#include<iostream>
using namespace std;
int main(){
        int num,n;
        cout<<"Enter a number: ";
        cin>>num;
        cout<<"Enter the number of multiples(n): ";
        cin>>n;
        cout<<"Table of "<<num<<" up to "<<n<<" multiples: "<<endl;
        for(int i=1;i<=n;i++){
            cout<<num<<"x"<<i<<"="<<num*i<<endl;
        }
        return 0;
}

//question 4(i):write a program to find greater of two numbers
#include<iostream>
using namespace std;
int main(){
        int num1,num2;
        cout<<"Enter two numbers:";
        cin>>num1>>num2;
        num1>num2?cout<<num1<<" is greater":cout<<num2<<" is greater";
        return 0;
}
//quetion 4(ii):write a program to find greater of three number
#include<iostream>
```

```
using namespace std;
int main(){
	int num1,num2,num3,max;
	cout<<"Enter three numbers : ";
	cin>>num1>>num2>>num3;
	max=num1>num2?(num1>num3?num1:num3):(num2>num3?num2:num3)
;
	cout<<max<<" is greater among three numbers.\n";
	return 0;

}
//question 5: write a program to find sum of first n natural number
#include<iostream>
using namespace std;
int main(){
	int n,sum=0;
	cout<<"Enter the value of N : ";
	cin>>n;
	for(int i=1;i<=n;i++){
		sum=sum+i;
	}
	cout<<"The sum of first "<<n<<" natural numbers is: "<<sum<<endl;
	return 0;
	}

//question 6: write a program to find factorial of given number
#include<iostream>
using namespace std;
int main(){
	int n,factorial=1;
	cout<<"Enter any number: ";
	cin>>n;
	while(n==0){
```

```
            cout<<"Factorial of 0 is 1";
            return 0;
        }
        for(int i=1;i<=n;i++){
            factorial=factorial*i;
        }
        cout<<"Factorial of "<<n<<" is : "<<factorial<<endl;
        return 0;
        }

//question 7: write a program to find sum of digits of n digit number
#include<iostream>
using namespace std;
int main(){
        int n,sum=0,r;
        cout<<"enter any number: ";
        cin>>n;
        int N=n;
        while(n>0){
            r=n%10;
            sum=sum+r;
            n=n/10;
        }
        cout<<"sum of "<<N<<" is: "<<sum;
        return 0;
}

//question 8: write a program to find reverse of  a given number
#include<iostream>
using namespace std;
int main(){
        int n,reverse=0,r;
        cout<<"Enter any number: ";
```

```
    cin>>n;
    while(n!=0){
        r=n%10;
        reverse=reverse*10+r;
        n=n/10;
    }
    cout<<"Reversed number is : "<<reverse<<endl;
    return 0;
}

//question 9: write a program to determine given number is palindrome or not.
#include<iostream>
using namespace std;
int main(){
    int n,reverse=0,r,original;
    cout<<"Enter any number: ";
    cin>>n;
    original=n;
    while(n!=0){
        r=n%10;
        reverse=reverse*10+r;
        n=n/10;
    }
    if(original==reverse){
        cout<<original<<" is a Palindrome number."<<endl;
    }
    else{
        cout<<original<<" is not a Palindrome number."<<endl;
    }
    return 0;
}

//Question 10 : Write a program to print fibonacci series upto n terms
```

```
#include<iostream>
using namespace std;
int main(){
	int n,first=0,second=1,next;
	cout<<"Enter the number of terms : ";
	cin>>n;
	cout<<"Fibonacci series upto "<<n<<" terms : ";
	for(int i=1;i<=n;i++){
		cout<<first<<" ";
		next=first+second;
		first=second;
		second=next;
	}
	return 0;
}
```

//question 11: write a program to determine given n digit numbers is armstrong number bor not

```
#include<iostream>
#include<math.h>
using namespace std;
int main(){
	int n,c=0,r,sum=0,x,m;
	cout<<"Enter any number: ";
	cin>>n;
	m=n;
	x=n;
	while(m>0){
		r=m%10;
		c++;
		m=m/10;
	}
	while(n>0){
```

```
            r=n%10;
            sum=sum+pow(r,c);
            n=n/10;
        }
        if(x==sum){
            cout<<x<<" is Armstrong number."<<endl;
        }
        else{
            cout<<x<<" is not Armstrong number."<<endl;
        }
        }

//question 12: write a program to print all even number between 100  to 200
#include<iostream>
using namespace std;
int main(){
        cout<<"Even numbers between 100 to 200 are: ";
        for(int i=100;i<=200;i++){
            if(i%2==0){
                cout<<i<<" ";
            }
        }
        return 0;
}

//question 13: write a program to print first 50 prime numbers
#include <iostream>
using namespace std;

int main() {
   int count = 0;
   int num = 2;
   cout<<"first 50 prime numbers are: ";
```

```
    while (count < 50) {
        bool isPrime = true;

        for (int i = 2; i < num; i++){
            if (num % i == 0) {
                isPrime = false;
                break;
            }
        }
        if (isPrime) {
            cout << num << " ";
            count++;
        }

        num++;
    }

    return 0;
}

//question  14: write a program to print all four digit armstrong number
#include<iostream>
#include<math.h>
using namespace std;
int main(){
        cout<<"All four digit Armstrong numbers are : \n";
        for(int num=1000;num<=9999;num++){
                int sum=0;
                int temp=num;
                while(temp>0){
                        int digit=temp%10;
                        sum=sum+pow(digit,4);
```

```
                temp=temp/10;
            }
            if(sum==num){
                cout<<num<<" "<<endl;
            }
        }
        return 0;
}

//question 15: write a program to print following pattern
/*      (i)  :          *
                        **
                        ***
                        ****
                        *****
                        */

#include<iostream>
using namespace std;
int main(){
        int i,j,n;
        cout<<"Enter number of rows: ";
        cin>>n;
        for(i=1;i<=n;i++){
            for(j=1;j<=i;j++){
                cout<<"*";
            }
            cout<<endl;
        }
return 0;
}

/*question 15: ( ii )  *****
```

```
                ****
                ***
                **
                *
*/
#include<iostream>
using namespace std;
int main(){
        int i,j,n;
        cout<<"Enter number of rows : ";
        cin>>n;
        for(i=n;i>=1;i--){
                for(j=1;j<=i;j++){
                        cout<<"*";
                }
                cout<<endl;
        }
        return 0;
}

/*question 15 : ( iii )     *
                           ***
                          *****
                         *******
  */
#include<iostream>
using namespace std;
int main(){
        int i,j,k,n;
        cout<<" Enter number of rows : ";
        cin>>n;
        for(i=1;i<+n;i++){
                for(j=1;j<=n-i;j++){
```

```
                cout<<" ";
            }
            for(k=1;k<=2*i-1;k++){
                cout<<"*";
            }
            cout<<endl;
        }
}
/*question 15  ( iv )   1
                        22
                        333
                        4444
                        55555
   */
#include<iostream>
using namespace std;
int main(){
        int i,j,n;
        cout<<"Enter number of rows : ";
        cin>>n;
        for(i=1;i<=n;i++){
            for(j=1;j<=i;j++){
                cout<<i;
            }
            cout<<endl;
        }
}

//question 15  ( v )   pascal's triangle
#include<iostream>
using namespace std;
int main(){
        int i,j,n,k;
```

```
        cout<<"Enter number of rows : ";
        cin>>n;
        for(i=0;i<n;i++){
        int val=1;
                for(j=0;j<n-i-1;j++){
                        cout<<" ";
                }
                for(k=0;k<=i;k++){
                                cout<<val<<" ";
                        val=val*(i-k)/(k+1);
                }
                cout<<endl;
        }
        return 0;
}

/*question 15 ( vi ) flyodd's triangle
                1
                2 3
                4 5 6
                7 8 9 10
   */

#include<iostream>
using namespace std;
int main(){
        int rows,number=1;
        cout<<"Enter number of rows : ";
        cin>>rows;
        for(int i=1;i<=rows;i++){
                for(int j=1;j<=i;j++){
                        cout<<number<<" ";
                        number++;
```

```
            }
        cout<<endl;
        }
        return 0;
}

//question 16 (i) to print all palindrome for a range 500-1000 using functions
#include<iostream>
using namespace std;
bool isPalindromes(int num){
        int original=num,reverse=0,digit;
        while(num>0){
                digit=num%10;
                reverse=reverse*10+digit;
                num=num/10;
        }
        return original==reverse;
}
void printPalindromes(int start,int end){
        cout<<"Palindromes between "<<start<<" and "<<end<<" are : ";
        for(int i=start;i<=end;i++){
                if(isPalindromes(i)){
                        cout<<i<<" ";
                }
        }
        cout<<endl;
}
int main(){
        printPalindromes(500,1000);
        return 0;
}

//question 16 (ii) To print first 100 odd numbers using function
```

```
#include<iostream>
using namespace std;
void  printOddnumbers(int n ){
	int count=0,num=1;
	while(count<n){
		cout<<num<<" ";
		num=num+2;
		count++;
}
cout<<endl;
}
int main(){
	cout<<"First 100 odd numbers are : ";
	printOddnumbers(100);
	return 0;
}
```

//question 16 (iii) to find binary,octal,hexadecimal equivalent of a given decimal number using function

```
#include<iostream>
using namespace std;
int decimalTobinary( long int num){
	int binary=0;
	int p=1;
	int r=0;
	while(num>0){
		r=num%2;
		binary+=r*p;
		p=p*10;
		num=num/2;
	}
	return binary;
}
```

```
 int decimalTooctal(int num){
        int octal=0;
        int p=1;
        int r=0;
        while(num>0){
            r=num%8;
            octal+=r*p;
            p*=10;
            num/=8;
}
return octal;
}
int main(){
        int num;
        cout<<"Enter a decimal number to get equivalent of binary and octal : ";
        cin>>num;
        int result=decimalTobinary(num);
        cout<<"Binary Equivalent: "<<result<<endl;
        result=decimalTooctal(num);
        cout<<"Octal Equivalent: "<<result<<endl;
        return 0;
        }

//question 16 ( v ) : write a program to print the geometric sum upto nth terms
#include<iostream>
#include<math.h>
using namespace std;
double geometricSum(double a,double r,double n){
   int sum=0;
   for (int i = 0; i < n; i++)
   {
      sum=sum+(a*pow(r,i));
   }
```

```
    return sum;
}
int main(){
    int a,r,n;
    cout<<"enter the first term of geometric series :";
    cin>>a;
    cout<<"enter the common ratio :";
    cin>>r;
    cout<<"enter the no. of term :";
    cin>>n;
    cout<<"geometric sum upto "<<n<<" terms : "<<geometricSum(a,r,n);
    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 18 : Write a program to calculate average of all elements of 1D array

#include<iostream>
using namespace std;
int main(){
    int n;
    int array[n];
    cout<<"Enter the size of an array:";
    cin>>n;

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

```
    for(int i=0; i<n; i++){
        cin>>array[i];
    }

    int sum=0;
    for(int i=0; i<n; i++){
        sum=sum+array[i];
    }

    float average=float(sum)/n;
    cout<<"average of an array is : "<<average<<endl;

    return 0;
}
//question 19 : Write a program to find out minimum and maximum value of a 1D numeric array
#include <iostream>
using namespace std;

int main() {
    int n, arr[n];
    cout << "Enter the size of the array: ";
    cin >> n;

    cout << "Enter " << n << " elements: ";
    for (int i = 0; i < n; i++) {
        cin >> arr[i];
    }

    int min = arr[0];
    int max = arr[0];

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

```
        if (arr[i] < min) {
            min = arr[i];
        }
        if (arr[i] > max) {
            max = arr[i];
        }
    }

    cout << "Minimum Value: " << min << endl;
    cout << "Maximum Value: " << max << endl;

    return 0;
}

//question 20 : write a program to find transpose 0f 2D matrix
#include<iostream>
using namespace std;
int main(){
        int r,c;
        cout<<"Enter number of rows : ";
        cin>>r;
        cout<<"Enter number of columns : ";
        cin>>c;
        int matrix[r][c],traspose[c][r];
        cout<<"Enter matrix elements : "<<endl;
        for(int i=0;i<r;i++){
                for(int j=0;j<c;j++){
                        cin>>matrix[i][j];
                }
        }
        cout<<"you entered matrix is : "<<endl;
        for(int i=0;i<r;i++){
                for(int j=0;j<c;j++){
```

```
                cout<<matrix[i][j]<<" ";
            }
            cout<<endl;
        }
        for(int i=0;i<r;i++){
            for(int j=0;j<c;j++){
                traspose[j][i]=matrix[i][j];
            }
        }
        cout<<"Traspose of the matrix is : "<<endl;
        for(int i=0;i<c;i++){
            for(int j=0;j<r;j++){
                cout<<traspose[i][j]<<" ";
            }
            cout<<endl;
        }
        return 0;
}

//question 21 : write a program to add 2D matrices

#include<iostream>
using namespace std;
int main() {
   int r, c;
   cout << "Enter no. of rows : ";
   cin >> r;
   cout<<" Enter no. of columns : ";
   cin>>c;
   int A[r][c], B[r][c], C[r][c];

   cout << "Enter elements of 1st matrix: ";
   for (int i = 0; i < r; i++) {
```

```
        for (int j = 0; j < c; j++) {
            cin >> A[i][j];
        }
    }

    cout << "Enter elements of second matrix: ";
    for (int i = 0; i < r; i++) {
        for (int j = 0; j < c; j++) {
            cin >> B[i][j];
        }
    }

    for (int i = 0; i < r; i++) {
        for (int j = 0; j < c; j++) {
            C[i][j] = A[i][j] + B[i][j];
        }
    }

    cout << "Sum of matrices:\n";
    for (int i = 0; i < r; i++) {
        for (int j = 0; j < c; j++) {
            cout << C[i][j] << " ";
        }
        cout << endl;
    }

    return 0;
}

//question 22 : Write a program to multiply 2D matrices
#include<iostream>
using namespace std;
```

```
int main() {
    int m, n, p;
    cout << "Enter rows & columns of 1st matrix: ";
    cin >> m >> n;
    cout << "Enter columns of second matrix: ";
    cin >> p;

    int A[m][n], B[n][p], C[m][p];

    cout << "Enter elements of 1st matrix: \n";
    for(int i = 0; i < m; i++) {
        for(int j = 0; j < n; j++) {
            cin >> A[i][j];
        }
    }

    cout << "Enter elements of 2nd matrix: \n";
    for(int i = 0; i < n; i++) {
        for(int j = 0; j < p; j++) {
            cin >> B[i][j];
        }
    }

    for(int i = 0; i < m; i++) {
        for(int j = 0; j < p; j++) {
            C[i][j] = 0;
        }
    }

    for(int i = 0; i < m; i++) {
        for(int j = 0; j < p; j++) {
            for(int k = 0; k < n; k++) {
                C[i][j] += A[i][k] * B[k][j];
```

```
            }
        }
    }

    cout << "Product of matrices: \n";
    for(int i = 0; i < m; i++) {
        for(int j = 0; j < p; j++) {
            cout << C[i][j] << " ";
        }
        cout << endl;
    }

    return 0;
}

//question 23 : write a program to sort an array in ascending order
 #include <iostream>
using namespace std;

int main() {
    int n;
    cout << "Enter size of an array: ";
    cin >> n;

    int arr[n];
    cout << "Enter "<<n<<" elements of an array: \n";
    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 tmp = arr[i];
            arr[i] = arr[j];
            arr[j] = tmp;
        }
    }
}

    cout << "Sorted array elements are: ";
    for(int i = 0; i < n; i++) {
        cout << arr[i] << " ";
    }

    return 0;
}

//question 24 : Write a program to reverse a given string

#include <iostream>
#include <algorithm>
using namespace std;

int main() {
    string str;
    cout << "Enter a string: ";
    cin >> str;

    reverse(str.begin(), str.end());

    cout << "Reversed string: " << str << endl;
    return 0;
}

//question 25 : Write a program to count all vowels in a given string
```

```
#include <iostream>
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];
      if (ch == 'a' || ch == 'e' || ch == 'i' || ch == 'o' || ch == 'u') {
         count++;
         if (vowels.find(ch) == -1) {
            vowels += ch;
         }
      }
   }

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

   return 0;
}

//question 26 : Write a program to check if a given string is palindrome or not
#include <iostream>
#include <string>
using namespace std;

int main() {
```

```
    string str;
    cout << "Enter a string: ";
    cin >> str;

    int start = 0;
    int end = str.length() - 1;
    bool isPalindrome = true;

    while (start < end) {
        if (str[start] != str[end]) {
            isPalindrome = false;
            break;
        }
        start++;
        end--;
    }

    if (isPalindrome) {
        cout << "The string is a palindrome." << endl;
    } else {
        cout << "The string is not a palindrome." << endl;
    }

    return 0;
}

//question 27 : Write a program to check if a 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 an anagram";
        return 0;
    }
    sort(str1.begin(), str1.end());
    sort(str2.begin(), str2.end());
    if (str1 == str2)
        cout << "Anagram";
    else
        cout << "Not an anagram";

    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 name : ";
        cin>>make;
                cout<<"Enter the model : ";
                cin>>model;
                cout<<"Enter year of manufacturing : ";
        cin >>year;
    }
    void getdata()
    {
        cout << "The manufacturing company is : " <<make<<endl;
                cout << "The model is : "<<model<<endl;
                cout << "The year of manufacturing is : "<<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;

// Address class
```

```
class Address {
    string street;
    string city;
    int zipcode;

public:
    void setData() {
        cout << "Enter the street: ";
        cin >> street;

        cout << "Enter the city: ";
        cin >> city;

        cout << "Enter the zipcode: ";
        cin >> zipcode;
    }

    void getData() {
        cout << "Street: " << street << endl;
        cout << "City: " << city << endl;
        cout << "Zipcode: " << zipcode << endl;
    }
};

// Person class (Composition)
class Person {
    string name;
    Address address; // Address object

public:
    void setPersonData() {
        cout << "Enter the person's name: ";
        cin >> name;
```

```
        cout << "Enter address details: "<<endl;
        address.setData();
    }

    void getPersonData() {
        cout << "Name: " << name << endl;
        cout << "Address Details:\n";
        address.getData();
    }
};

int main() {
    Person p1;
    p1.setPersonData();
    p1.getPersonData();
    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;
```

```
}

//Question 31 : class student ( from lab assignment question 2 )
#include<iostream>
#include<string>
using namespace std;

class Student {
private:
   int admno;
   char sname[20];
   float eng, math, science;
   float total;

   float ctotal() {
      return eng + math + science;
   }

public:
   void Takedata() {
      cout << "Enter Admission Number: ";
      cin >> admno;

      cout << "Enter Student Name : ";
      cin >>sname;

      cout << "Enter marks of English, Math, and Science: ";
      cin >> eng >> math >> science;

      total = ctotal();
   }

   void Showdata() {
```

```
        cout << "\nStudent Details:\n";
        cout << "Admission No: " << admno << endl;
        cout << "Name: " << sname << endl;
        cout << "English: " << eng << ", Math: " << math << ", Science: " << science <<
endl;
        cout << "Total Marks: " << total << endl;
    }
};

int main() {
    Student s;
    s.Takedata();
    s.Showdata();
    return 0;
}

//Question 32 : ClassFlight ( from lab assignment question no. 3 )
#include <iostream>
#include <string>
using namespace std;

class Flight {
private:
    int FlightNumber;
    string Destination;
    float Distance;
    float Fuel;

    void CALFUEL() {
        if (Distance <= 1000)
            Fuel = 500;
        else if (Distance > 1000 && Distance <= 2000)
            Fuel = 1100;
```

```
        else
            Fuel = 2200;
    }

public:
    void FEEDINFO() {
        cout << "Enter Flight Number: ";
        cin >> FlightNumber;
        cout << "Enter Destination: ";
        cin >> Destination;
        cout << "Enter Distance: ";
        cin >> Distance;

        CALFUEL();
    }

    void SHOWINFO() {
        cout << "\nFlight Details:\n";
        cout << "Flight Number: " << FlightNumber << endl;
        cout << "Destination: " << Destination << endl;
        cout << "Distance: " << Distance << " km" << endl;
        cout << "Fuel Required: " << Fuel << " liters" << endl;
    }
};

int main() {
    Flight F;
    F.FEEDINFO();
    F.SHOWINFO();
    return 0;
}

//Question 33 : Menu Driven ( from lab assignment question 4 )
```

```
#include <iostream>
using namespace std;
#define SIZE 10
void inputMatrix(int mat[SIZE][SIZE], int rows, int cols) {
    cout << "Enter elements of the matrix:\n";
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            cin >> mat[i][j];
        }
    }
}
void displayMatrix(int mat[SIZE][SIZE], int rows, int cols) {
    cout << "Matrix is:\n";
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            cout << mat[i][j] << " ";
        }
        cout << endl;
    }
}
void addMatrix(int mat1[SIZE][SIZE], int mat2[SIZE][SIZE], int result[SIZE][SIZE], int
rows, int cols) {
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            result[i][j] = mat1[i][j] + mat2[i][j];
        }
    }
}
void multiplyMatrix(int mat1[SIZE][SIZE], int mat2[SIZE][SIZE], int
result[SIZE][SIZE], int r1, int c1, int r2, int c2) {
    for (int i = 0; i < r1; i++) {
        for (int j = 0; j < c2; j++) {
            result[i][j] = 0;
```

```
            for (int k = 0; k < c1; k++) {
                result[i][j] += mat1[i][k] * mat2[k][j];
            }
        }
    }
}
void transposeMatrix(int mat[SIZE][SIZE], int trans[SIZE][SIZE], int rows, int cols) {
    for (int i = 0; i < rows; i++) {
        for (int j = 0; j < cols; j++) {
            trans[j][i] = mat[i][j];
        }
    }
}

int main() {
    int mat1[SIZE][SIZE], mat2[SIZE][SIZE], result[SIZE][SIZE];
    int rows, cols, r2, c2, choice;

    while (true) {
        cout << "\nMenu:\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: ";
                cin >> rows >> cols;
```

```
    inputMatrix(mat1, rows, cols);
    break;

case 2:
    displayMatrix(mat1, rows, cols);
    break;

case 3:
    cout << "Enter rows and columns for second matrix: ";
    cin >> r2 >> c2;
    if (r2 != rows || c2 != cols) {
        cout << "Addition not possible (different dimensions)\n";
    } else {
        inputMatrix(mat2, rows, cols);
        addMatrix(mat1, mat2, result, rows, cols);
        cout << "Sum of matrices:\n";
        displayMatrix(result, rows, cols);
    }
    break;

case 4:
    cout << "Enter rows and columns for second matrix: ";
    cin >> r2 >> c2;
    if (cols != r2) {
        cout << "Multiplication not possible (invalid dimensions)\n";
    } else {
        inputMatrix(mat2, r2, c2);
        multiplyMatrix(mat1, mat2, result, rows, cols, r2, c2);
        cout << "Product of matrices:\n";
        displayMatrix(result, rows, c2);
    }
    break;
```

```
            case 5:
                transposeMatrix(mat1, result, rows, cols);
                cout << "Transpose of the matrix:\n";
                displayMatrix(result, cols, rows);
                break;

            case 6:
                cout << "Exiting program.\n";
                return 0;

            default:
                cout << "Invalid choice! Try again.\n";
        }
    }
return 0;
}
```