# C# Lab 01.

**1).**

using System;

namespace NameAndBatchConsoleApp

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter your name:");

string name = Console.ReadLine();

Console.WriteLine("Please enter your batch:");

string batch = Console.ReadLine();

Console.WriteLine("Name: " + name);

Console.WriteLine("Batch: " + batch);

}

}

}

**2).**

using System;

namespace CircleAreaConsoleApp

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter the radius of the circle:");

double radius = Convert.ToDouble(Console.ReadLine());

double area = Math.PI \* radius \* radius;

Console.WriteLine("The area of the circle is: " + area);

}

}

}

**3).**

using System;

namespace SummationConsoleApp

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter the first number:");

int num1 = Convert.ToInt32(Console.ReadLine());

Console.WriteLine("Please enter the second number:");

int num2 = Convert.ToInt32(Console.ReadLine());

int sum = num1 + num2;

Console.WriteLine("Summation: " + sum);

}

}

}

**4).**

using System;

namespace SalaryAfterTaxConsoleApp

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter the employee's salary:");

double salary = Convert.ToDouble(Console.ReadLine());

Console.WriteLine("Please enter the tax rate (in decimal form, e.g., 0.2 for 20%):");

double taxRate = Convert.ToDouble(Console.ReadLine());

double taxAmount = salary \* taxRate;

double salaryAfterTax = salary - taxAmount;

Console.WriteLine("Salary after tax: " + salaryAfterTax);

}

}

}

# C# Lab 02.

**1**).

using System;

namespace SumOfTwoNumbersConsoleApp

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter the first number:");

double num1 = Convert.ToDouble(Console.ReadLine());

Console.WriteLine("Please enter the second number:");

double num2 = Convert.ToDouble(Console.ReadLine());

double sum = num1 + num2;

Console.WriteLine("Sum: " + sum);

}

}

}

**2).**

using System;

namespace ArithmeticOperationsConsoleApp

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter the first number:");

double num1 = Convert.ToDouble(Console.ReadLine());

Console.WriteLine("Please enter the second number:");

double num2 = Convert.ToDouble(Console.ReadLine());

double sum = num1 + num2;

double subtraction = num1 - num2;

double multiplication = num1 \* num2;

double division = num1 / num2;

Console.WriteLine("Sum: " + sum);

Console.WriteLine("Subtraction: " + subtraction);

Console.WriteLine("Multiplication: " + multiplication);

Console.WriteLine("Division: " + division);

}

}

}

**3).**

using System;

namespace CircleGeometryConsoleApp

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter the radius of the circle:");

double radius = Convert.ToDouble(Console.ReadLine());

double area = Math.PI \* radius \* radius;

double circumference = 2 \* Math.PI \* radius;

Console.WriteLine("Area: " + area);

Console.WriteLine("Circumference: " + circumference);

}

}

}

**4).**

using System;

namespace EvenOrOddConsoleApp

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter a number:");

int number = Convert.ToInt32(Console.ReadLine());

if (number % 2 == 0)

Console.WriteLine("Even");

else

Console.WriteLine("Odd");

}

}

}

**5).**

using System;

namespace EvenOrOddMultipleInputsConsoleApp

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter 10 numbers:");

for (int i = 0; i < 10; i++)

{

int number = Convert.ToInt32(Console.ReadLine());

if (number % 2 == 0)

Console.WriteLine("Even");

else

Console.WriteLine("Odd");

}

}

}

}

# C# Lab 03.

**1).**

using System;

namespace EvenOrOddProgram

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter an integer:");

int number = Convert.ToInt32(Console.ReadLine());

if (number % 2 == 0)

Console.WriteLine("Even");

else

Console.WriteLine("Odd");

}

}

}

**2).**

using System;

namespace VowelCountProgram

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter a string:");

string inputString = Console.ReadLine().ToLower(); // Convert the string to lowercase for case-insensitivity

int vowelCount = 0;

foreach (char c in inputString)

{

if ("aeiou".Contains(c)) // Check if the character is a vowel

vowelCount++;

}

Console.WriteLine("Number of vowels in the string: " + vowelCount);

}

}

}

**3).**

using System;

namespace SumOfDigitsProgram

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter a number:");

int number = Convert.ToInt32(Console.ReadLine());

int sum = 0;

int temp = number;

while (temp != 0)

{

sum += temp % 10;

temp /= 10;

}

Console.WriteLine("Sum of digits of the number: " + sum);

}

}

}

**4).**

using System;

namespace FactorialProgram

{

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter a number:");

int number = Convert.ToInt32(Console.ReadLine());

long factorial = 1;

for (int i = 1; i <= number; i++)

{

factorial \*= i;

}

Console.WriteLine("Factorial of the number: " + factorial);

}

}

}

# C# Lab 04.

**Question 01.**

**1).**

using System;

namespace KilometerToMeterConversion

{

class ConvertValues

{

public void KilometerToMeter()

{

Console.WriteLine("Please enter the distance in kilometers:");

double kilometers = Convert.ToDouble(Console.ReadLine());

double meters = kilometers \* 1000;

Console.WriteLine("Distance in meters: " + meters);

}

}

class Program

{

static void Main(string[] args)

{

ConvertValues converter = new ConvertValues();

converter.KilometerToMeter();

}

}

}

**2).**

using System;

namespace KilometerToMeterConversionWithParameter

{

class ConvertValues

{

public void KilometerToMeter(double kilometers)

{

double meters = kilometers \* 1000;

Console.WriteLine("Distance in meters: " + meters);

}

}

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter the distance in kilometers:");

double kilometers = Convert.ToDouble(Console.ReadLine());

ConvertValues converter = new ConvertValues();

converter.KilometerToMeter(kilometers);

}

}

}

**3**).

using System;

namespace KilometerToMeterConversionWithReturn

{

class ConvertValues

{

public double KilometerToMeter(double kilometers)

{

double meters = kilometers \* 1000;

return meters;

}

}

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter the distance in kilometers:");

double kilometers = Convert.ToDouble(Console.ReadLine());

ConvertValues converter = new ConvertValues();

double meters = converter.KilometerToMeter(kilometers);

Console.WriteLine("Distance in meters: " + meters);

}

}

}

**Question 02.**

using System;

namespace CircleAreaCircumference

{

class FindValues

{

public double FindArea(double radius)

{

double area = Math.PI \* radius \* radius;

return area;

}

public double FindCircumference(double radius)

{

double circumference = 2 \* Math.PI \* radius;

return circumference;

}

}

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Please enter the radius of the circle:");

double radius = Convert.ToDouble(Console.ReadLine());

FindValues finder = new FindValues();

double area = finder.FindArea(radius);

double circumference = finder.FindCircumference(radius);

Console.WriteLine("Area of the circle: " + area);

Console.WriteLine("Circumference of the circle: " + circumference);

}

}

}

# C# Lab 05.

**Question 03.**

using System;

class Program

{

static void Main(string[] args)

{

Console.WriteLine("Enter 1 for addition, 2 for subtraction, 3 for multiplication, 4 for division:");

int choice = int.Parse(Console.ReadLine());

Console.WriteLine("Enter number 1:");

double num1 = double.Parse(Console.ReadLine());

Console.WriteLine("Enter number 2:");

double num2 = double.Parse(Console.ReadLine());

double result = 0;

CalculateValues calculator = new CalculateValues();

switch (choice)

{

case 1:

result = calculator.Addition(num1, num2);

break;

case 2:

result = calculator.Subtraction(num1, num2);

break;

case 3:

result = calculator.Multiplication(num1, num2);

break;

case 4:

result = calculator.Division(num1, num2);

break;

default:

Console.WriteLine("Invalid choice");

return;

}

Console.WriteLine("Your answer is: " + result);

}

}

class CalculateValues

{

public double Addition(double num1, double num2)

{

return num1 + num2;

}

public double Subtraction(double num1, double num2)

{

return num1 - num2;

}

public double Multiplication(double num1, double num2)

{

return num1 \* num2;

}

public double Division(double num1, double num2)

{

if (num2 == 0)

{

Console.WriteLine("Cannot divide by zero");

return double.NaN;

}

return num1 / num2;

}

}

**Question 04.**

using System;

public class Helper

{

private void sayHello()

{

Console.WriteLine("Hello, World!");

}

public void CallSayHello()

{

sayHello(); // This method can access the private sayHello() method within the same class.

}

}

using System;

class Program

{

static void Main(string[] args)

{

Helper helper = new Helper();

// helper.sayHello(); // This line will cause a compilation error since sayHello() is a private method and cannot be accessed from outside the Helper class.

helper.CallSayHello(); // This line will work fine, as CallSayHello() can access the private sayHello() method within the Helper class.

}

}

* We cannot directly access the private method from outside the class. However,we can indirectly access the private method of a class by calling a public method within the same class that, in turn, calls the private method. This allows for better encapsulation and control over the internal behavior of the class.

**Question 05.**

using System;

public class ArrayHelper

{

public int[] InputValues()

{

int[] arr = new int[10];

Console.WriteLine("Enter 10 values for the array:");

for (int i = 0; i < arr.Length; i++)

{

Console.Write($"Value {i + 1}: ");

arr[i] = int.Parse(Console.ReadLine());

}

return arr;

}

public int FindMinimum(int[] arr)

{

int min = arr[0];

for (int i = 1; i < arr.Length; i++)

{

if (arr[i] < min)

min = arr[i];

}

return min;

}

public int FindMaximum(int[] arr)

{

int max = arr[0];

for (int i = 1; i < arr.Length; i++)

{

if (arr[i] > max)

max = arr[i];

}

return max;

}

public double CalculateAverage(int[] arr)

{

int sum = 0;

foreach (int num in arr)

{

sum += num;

}

return (double)sum / arr.Length;

}

public int[] ReverseArray(int[] arr)

{

int[] reversedArr = new int[arr.Length];

for (int i = 0; i < arr.Length; i++)

{

reversedArr[i] = arr[arr.Length - i - 1];

}

return reversedArr;

}

}

using System;

class Program

{

static void Main(string[] args)

{

ArrayHelper arrayHelper = new ArrayHelper();

int[] arr = arrayHelper.InputValues();

int min = arrayHelper.FindMinimum(arr);

int max = arrayHelper.FindMaximum(arr);

double average = arrayHelper.CalculateAverage(arr);

int[] reversedArr = arrayHelper.ReverseArray(arr);

Console.WriteLine("Minimum value: " + min);

Console.WriteLine("Maximum value: " + max);

Console.WriteLine("Average value: " + average);

Console.WriteLine("Array in reverse order:");

foreach (int num in reversedArr)

{

Console.Write(num + " ");

}

}

}

# C# Lab 06.

**Question 06.**

using System;

public class ArrayHelper

{

public int[] CreateArrayWithZeros(int size)

{

int[] arr = new int[size \* 2];

Console.WriteLine("Enter values for the array:");

for (int i = 0; i < size; i++)

{

Console.Write($"Value {i + 1}: ");

arr[i \* 2] = int.Parse(Console.ReadLine());

arr[i \* 2 + 1] = 0;

}

return arr;

}

}

using System;

class Program

{

static void Main(string[] args)

{

Console.Write("Enter the size of the array: ");

int size = int.Parse(Console.ReadLine());

ArrayHelper arrayHelper = new ArrayHelper();

int[] arr = arrayHelper.CreateArrayWithZeros(size);

Console.WriteLine("Values inside the array:");

foreach (int num in arr)

{

Console.Write(num + " ");

}

}

}

**Question 07.**

using System;

public class ArrayOperations

{

public int ScalarSum(int[] arr)

{

int sum = 0;

foreach (int num in arr)

{

sum += num;

}

return sum;

}

public int[] VectorSum(int[] arr1, int[] arr2)

{

if (arr1.Length != arr2.Length)

{

throw new ArgumentException("Both arrays should have the same size for vector sum.");

}

int[] result = new int[arr1.Length];

for (int i = 0; i < arr1.Length; i++)

{

result[i] = arr1[i] + arr2[i];

}

return result;

}

public int[] VectorProduct(int[] arr1, int[] arr2)

{

if (arr1.Length != arr2.Length)

{

throw new ArgumentException("Both arrays should have the same size for vector product.");

}

int[] result = new int[arr1.Length];

for (int i = 0; i < arr1.Length; i++)

{

result[i] = arr1[i] \* arr2[i];

}

return result;

}

public int ScalarProduct(int[] arr1, int[] arr2)

{

if (arr1.Length != arr2.Length)

{

throw new ArgumentException("Both arrays should have the same size for scalar product.");

}

int product = 0;

for (int i = 0; i < arr1.Length; i++)

{

product += arr1[i] \* arr2[i];

}

return product;

}

}

using System;

class Program

{

static void Main(string[] args)

{

Console.Write("Enter the size of the arrays: ");

int size = int.Parse(Console.ReadLine());

int[] arr1 = new int[size];

int[] arr2 = new int[size];

Console.WriteLine("Enter values for the first array:");

for (int i = 0; i < size; i++)

{

Console.Write($"Value {i + 1}: ");

arr1[i] = int.Parse(Console.ReadLine());

}

Console.WriteLine("Enter values for the second array:");

for (int i = 0; i < size; i++)

{

Console.Write($"Value {i + 1}: ");

arr2[i] = int.Parse(Console.ReadLine());

}

ArrayOperations arrayOperations = new ArrayOperations();

int scalarSum = arrayOperations.ScalarSum(arr1);

Console.WriteLine("Scalar Sum: " + scalarSum);

int[] vectorSum = arrayOperations.VectorSum(arr1, arr2);

Console.WriteLine("Vector Sum:");

PrintArray(vectorSum);

int[] vectorProduct = arrayOperations.VectorProduct(arr1, arr2);

Console.WriteLine("Vector Product:");

PrintArray(vectorProduct);

int scalarProduct = arrayOperations.ScalarProduct(arr1, arr2);

Console.WriteLine("Scalar Product: " + scalarProduct);

}

static void PrintArray(int[] arr)

{

foreach (int num in arr)

{

Console.Write(num + " ");

}

Console.WriteLine();

}

}

**Question 08.**

using System;

class Animal

{

public void AnimalMethod()

{

Console.WriteLine("I am an Animal");

}

}

class Dog : Animal

{

public void DogMethod()

{

Console.WriteLine("I have four legs");

}

}

class Program

{

static void Main(string[] args)

{

// Creating an object of the Dog class

Dog myDog = new Dog();

// Calling methods from both classes

myDog.AnimalMethod();

myDog.DogMethod();

// Displaying the desired output

Console.WriteLine("I am an animal and I have four legs");

}

}