**Best Programming Practices**

1. All values as variables including Fixed, User Inputs, and Results
2. Proper naming conventions for all variables

String name = "Eric";

double height = input.nextDouble();

double totalDistance = distanceFromToVia + distanceViaToFinalCity;

1. Proper Program Name and Class Name
2. Follow proper indentation
3. Give comments for every step or logical block like a variable declaration or conditional and loop blocks

**Sample Program 1 - Create a program to check if 3 values are internal angles of a triangle.**

**IMP => Follow Good Programming Practice demonstrated below in all Practice Programs**

**Hint:**

1. Get integer inputs for 3 variables named x, y, and z.
2. Calculate the sum of x, y, and z.
3. If the sum equals 180, print "The given angles are internal angles of a triangle."
4. Otherwise, print "They are not internal angles of a triangle."

using System;

class TriangleChecker

{

static void Main(string[] args)

{

// Prompt the user for input

Console.WriteLine("Enter three angles of a triangle:");

// Get 3 input values for angles

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

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

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

// Calculate the sum of all angles

int sumOfAngles = x + y + z;

// Display the sum of angles

Console.WriteLine($"The given angles {x}, {y}, {z} add to {sumOfAngles}");

// Check if the sum equals 180 and display the result

if (sumOfAngles == 180)

{

Console.WriteLine("The given angles are internal angles of a Triangle.");

}

else

{

Console.WriteLine("The given angles are not internal angles of a Triangle.");

}

}

}

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**Sample Program 2 - Create a program to find the sum of all the digits of a number given by a user.**

**Hint =>**

1. Get an integer input for the number variable.
2. Create an integer variable sum with an initial value of 0.
3. Create a while loop to access each digit of the number.
4. Inside the loop, add each digit of the number to the sum.
5. Finally, print the sum outside the loop

using System;

class SumOfDigits

{

static void Main(string[] args)

{

// Prompt the user for input

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

// Get input value for the number

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

// Define variables

int number = origNumber;

int sum = 0;

// Loop to extract and sum each digit

while (number != 0)

{

// Extract the last digit

int digit = number % 10;

// Add the digit to the sum

sum += digit;

// Remove the last digit from the number

number /= 10;

}

// Display the sum of the digits

Console.WriteLine($"The sum of the digits of {origNumber} is {sum}");

}

}

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# Level 1 Practice Programs

1. Write a program to check if a number is divisible by 5

I/P => number

O/P => Is the number \_\_\_ divisible by 5? \_\_\_

| using System;  class Solution {  public static void Main() {  // prompt for user number input  Console.Write("Enter a number: ");  int number = int.Parse(Console.ReadLine());    // checking whether number is divisible by 5 or not  bool isDivisible = (number % 5 == 0) ? true : false;    // printing result  Console.WriteLine("Is the number {0} divisible by 5? {1}" , number , isDivisible);  } } |
| --- |

1. Write a program to check if the first is the smallest of the 3 numbers.

I/P => number1, number2, number3

O/P => Is the first number the smallest? \_\_\_\_

| using System;  class Solution {  public static void Main() {  // prompt for user number input  Console.Write("Enter three numbers: ");  int number1 = int.Parse(Console.ReadLine());  int number2 = int.Parse(Console.ReadLine());  int number3 = int.Parse(Console.ReadLine());    // checking whether first number is smallest or not  bool isSmallest = (number1 < number2 && number1 < number3) ? true : false;    // printing result  Console.WriteLine("Is the first number the smallest? {0}" , isSmallest);  } } |
| --- |

1. Write a program to check if the first, second, or third number is the largest of the three.

I/P => number1, number2, number3

O/P =>

Is the first number the largest? \_\_\_\_

Is the second number the largest? \_\_\_

Is the third number the largest? \_\_\_

| using System;  class Solution {  public static void Main() {  //prompt user for three numbers input  Console.Write("Enter three numbers: ");  int number1 = int.Parse(Console.ReadLine());  int number2 = int.Parse(Console.ReadLine());  int number3 = int.Parse(Console.ReadLine());    //checking the largest number  bool isFirstLargest = number1 > number2 && number1 > number3;  bool isSecondLargest = number2 > number1 && number2 > number3;  bool isThirdLargest = !isFirstLargest && !isSecondLargest;   // Printing the result  Console.WriteLine("Is the first number the largest? {0}", isFirstLargest);  Console.WriteLine("Is the second number the largest? {0}", isSecondLargest);  Console.WriteLine("Is the third number the largest? {0}", isThirdLargest);  } } |
| --- |

1. Write a program to check for the natural number and write the sum of n natural numbers

**Hint =>**

1. A Natural Number is a positive integer (1,2,3, etc) sometimes with the inclusion of 0
2. A sum of n natural numbers is n \* (n+1) / 2

I/P => number

O/P => If the number is a positive integer then the output is

The sum of \_\_\_ natural numbers is \_\_\_

Otherwise

The number \_\_\_ is not a natural number

| using System;  class Solution {  public static void Main() {  //prompt user for number input  Console.Write("Enter number: ");  int number = int.Parse(Console.ReadLine()); |
| --- |

| // checking number is natural number  if(number > 0) {  //calculating sum of natural numbers  int sum = (number \* (number + 1)) / 2;    //printing result  Console.WriteLine("The sum of {0} natural numbers is {1}" , number , sum);  }  else {  //printing result  Console.WriteLine("The number {0} is not a natural numbers" , number);  }  } } |
| --- |

1. Write a program to check whether a person can vote, depending on whether his/her age is greater than or equal to 18.

**Hint =>**

1. Get integer input from the user and store it in the age variable.
2. If the person is 18 or older, print "The person can vote." Otherwise, print "The person cannot vote."

I/P => age

O/P => If the person's age is greater or equal to 18 then the output is

The person's age is \_\_\_ and can vote.

Otherwise

The person's age is \_\_\_ and cannot vote.

| using System;  class Solution {  public static void Main() {  //prompt user for age input  Console.Write("Enter number: ");  int age = int.Parse(Console.ReadLine());    // checking person can vote or not  if(age >= 18) {  // printing result  Console.WriteLine("The person's age is {0} and can vote" , age);  }  else {  // printing result  Console.WriteLine("The person's age is {0} and can vote" , age);  }  } } |
| --- |

1. Write a program to check whether a number is positive, negative, or zero.

**Hint =>**

1. Get integer input from the user and store it in the number variable.
2. If the number is positive, print positive.
3. If the number is negative, print negative.
4. If the number is zero, print zero.

| using System;  class Solution {  public static void Main() {  //prompt user for number input  Console.Write("Enter a number: ");  int number = int.Parse(Console.ReadLine());    //checking and printing result  if (number > 0) {  Console.WriteLine("Positive");  }  else if (number < 0) {  Console.WriteLine("Negative");  }  else {  Console.WriteLine("Zero");  }  } } |
| --- |

1. Write a program SpringSeason that takes two int values month and day from the command line and prints “Its a Spring Season” otherwise prints “Not a Spring Season”.

**Hint =>**

1. Spring Season is from March 20 to June 20

| using System;  class Solution {  public static void Main(string[] args) {  //using command line argument to take month and day input  int month = int.Parse(args[0]);  int day = int.Parse(args[1]);      //checking and printing result  if ((month == 3 && day >= 20 && day <= 31) || (month == 4 && day >= 20 && day <= 30) || (month == 5 && day >= 20 && day <= 31) || (month == 6 && day <= 20)) {  Console.WriteLine("It's a Spring Season.");  }  else {  Console.WriteLine("Not a Spring Season.");  }  } } |
| --- |

1. Write a program to count down the number from the user input value to 1 using a ***while*** loop for a rocket launch

**Hint =>**

1. Create a variable counter to take user inputted value for the countdown.
2. Use the ***while*** loop to check if the counter is 1
3. Inside a ***while*** loop, print the value of the counter and decrement the counter.

| using System;  class Solution {  public static void Main() {  //prompt user for number input  Console.Write("Enter the countdown start number: ");  int counter = int.Parse(Console.ReadLine());    // printing the value and decrement the counter   while (counter > 0) {  Console.WriteLine(counter);  counter--;  }  } } |
| --- |

1. Rewrite program 8 to do the countdown using the ***for-***loop

| using System;  class Solution {  public static void Main() {  //prompt user for number input  Console.Write("Enter the countdown start number: ");  int counter = int.Parse(Console.ReadLine());    // printing the value and decrement the counter   for (int i = counter; i > 0; i--) {  Console.WriteLine(i);  }  } } |
| --- |

1. Write a program to find the sum of numbers until the user enters 0

**Hint =>**

1. Create a variable total of type double initialize to 0.0. Also, create a variable to store the double value the user enters
2. Use the ***while*** loop to check if the user entered is 0
3. If the user entered value is not 0 then inside the while block add user entered value to the total and ask the user to input again
4. The loop will continue till the user enters zero and outside the loop display the total value

| using System;  class Solution {  public static void Main() {    // creating variable total and userInput  double total = 0.0;  double userInput = 1;    // using while loop to calculate result  while (userInput != 0) {  // prompt user for number input  Console.Write("Enter a number (0 to stop): ");  userInput = double.Parse(Console.ReadLine());  // calculating result  total += userInput;  }  // printing result  Console.WriteLine("The total sum is {0}" , total);  } } |
| --- |

1. Rewrite the program 10 to find the sum until the user enters 0 or a negative number using ***while*** loop and break statement

**Hint =>**

1. Use infinite while loop as in while (true)
2. Take the user entry and check if the user entered 0 or a negative number to break the loop using break;

| using System;  class Solution {  public static void Main() {  // creating variable total  double total = 0.0;    // using while loop to calculate result  while (true) {  // prompt user for number input  Console.Write("Enter a number (0 or negative to stop): ");  double userInput = double.Parse(Console.ReadLine());    // break the loop if number is 0 or negative  if (userInput <= 0) {  break;  }    // calculating result  total += userInput;  }   // printing result  Console.WriteLine("The total sum is {0}" , total);  } } |
| --- |

1. Write a program to find the sum of n natural numbers using ***while*** loop compare the result with the formulae n\*(n+1)/2 and show the result from both computations was correct.

**Hint =>**

1. Take the user input number and check whether it's a Natural number
2. If it's a natural number Compute using formulae as well as compute using ***while*** loop
3. Compare the two results and print the result

| using System;  class Solution {  public static void Main() {  // prompt user for number input  Console.Write("Enter a natural number: ");  int n = int.Parse(Console.ReadLine());    //creating sum and flag(i) variable  int sum = 0, i = 1;    // using while loop to calculate sum  while (i <= n) {  sum += i;  i++;  }   // using formula to calculate sum  int formulaSum = n \* (n + 1) / 2;    // comparing and printing result  Console.WriteLine("Sum using while loop == sum using formula? {0}" , sum == formulaSum);  Console.WriteLine("Sum using while loop: {0}" , sum);  Console.WriteLine("Sum using formula: {0}" , formulaSum);  } } |
| --- |

1. Rewrite the program number 12 with the ***for*** loop instead of a while loop to find the sum of n Natural Numbers.

**Hint =>**

1. Take the user input number and check whether it's a Natural number
2. If it's a natural number Compute using formulae as well as compute using ***for*** loop
3. Compare the two results and print the result

| using System;  class Solution {  public static void Main() {  // prompt user for number input  Console.Write("Enter a natural number: ");  int n = int.Parse(Console.ReadLine());    // creating sum variable  int sum = 0;    // using for loop to calculate sum  for (int i = 1; i <= n; i++) {  sum += i;  }   // using formula to calculate sum  int formulaSum = n \* (n + 1) / 2;    // comparing and printing result  Console.WriteLine("Sum using for loop == sum using formula? {0}" , sum == formulaSum);  Console.WriteLine("Sum using for loop: {0}" , sum);  Console.WriteLine("Sum using formula: {0}" , formulaSum);  }  } |
| --- |

1. Write a Program to find the factorial of an integer entered by the user.

**Hint =>**

1. For example, the factorial of 4 is 1 \* 2 \* 3 \* 4 which is 24.
2. Take an integer input from the user and assign it to the variable. Check the user has entered a positive integer.
3. Using a ***while*** loop, compute the factorial.
4. Print the factorial at the end.

| using System;  class Solution {  public static void Main() {  // prompt user for number input  Console.Write("Enter a positive integer: ");  int number = int.Parse(Console.ReadLine());   // creating factorial and flag(i) variable  int factorial = 1, i = 1;    // calculating result  while (i <= number) {  factorial \*= i;  i++;  }   // printing result  Console.WriteLine("Factorial of {0} is {1}" , number , factorial);  } } |
| --- |

1. Rewrite program 14 using for loop

**Hint =>**

1. Take the integer input, check for natural number and determine the factorial using for loop and finally print the result.

| using System;  class Solution {  public static void Main() {  // prompt user for number input  Console.Write("Enter a positive integer: ");  int number = int.Parse(Console.ReadLine());   // creating factorial variable  int factorial = 1;    // calculating result  for (int i = 1; i <= n; i++) {  factorial \*= i;  i++;  }   // printing result  Console.WriteLine("Factorial of {0} is {1}" , number , factorial);  } } |
| --- |

1. Create a program to print odd and even numbers between 1 to the number entered by the user.

**Hint =>**

1. Get an integer input from the user, assign to a variable number and check for Natural Number
2. Using a for loop, iterate from 1 to the number
3. In each iteration of the loop, print the number is odd or even number

| using System;  class Solution {  public static void Main() {  // prompt user for number input  Console.Write("Enter a number: ");  int number = int.Parse(Console.ReadLine());    // checking for natural number and compute result  if(number > 0) {  Console.WriteLine("{0} is natural." , number);    // printing result using for loop  for (int i = 1; i <= number; i++) {  if (i % 2 == 0) {  Console.WriteLine("{0} is even." , i);  }  else {  Console.WriteLine("{0} is odd." , i);  }  }  }else {  Console.WriteLine("{0} is not natural." , number);  }   } } |
| --- |

1. Create a program to find the bonus of employees based on their years of service.

**Hint =>**

1. Zara decided to give a bonus of 5% to employees whose year of service is more than 5 years.
2. Take salary and year of service in the year as input.
3. Print the bonus amount.

| using System;  class Solution {  public static void Main() {  // prompt user for salary input  Console.Write("Enter the salary: ");  double salary = double.Parse(Console.ReadLine());    // prompt user for years of Service input  Console.Write("Enter years of service: ");  int yearsOfService = int.Parse(Console.ReadLine());   // checking and printing result  if (yearsOfService > 5) {  // calculating bonus  double bonus = 0.05 \* salary;    Console.WriteLine($"The bonus amount is {bonus}");  }  else {  Console.WriteLine("No bonus is applicable.");  }  } } |
| --- |

1. Create a program to find the multiplication table of a number entered by the user from 6 to 9.

**Hint =>**

1. Take integer input and store it in the variable number
2. Using a for loop, find the multiplication table of number from 6 to 9 and print it in the format number \* i = \_\_\_

| class Solution {  public static void Main() {  // prompt user for number input  Console.Write("Enter a number from 6 to 9: ");  int number = int.Parse(Console.ReadLine());   // computing and printing multiplication table  for (int i = 1; i <= 10; i++) {  Console.WriteLine("{0} \* {1} = {2}" , number , i , number \* i);  }  } } |
| --- |