Class Task: Basic Operations in Programming Languages

**LESSON 1**

# TASK 1: Common Operations in VB.NET

**You will need to undertake some research on how to use the operation/function, create a simple program and place the code within the example section.**

|  |  |
| --- | --- |
| **Operation or function** | **VB.NET example (code)** |
| Divide by Integer | Console.WriteLine(11 \ 5) |
| Modulo | Console.WriteLine(11 Mod 3) |
| Exponentiation | Console.WriteLine(2 ^ 4 + 3 ^ 2) |
| Round | Dim number As Single = 5.2345  Console.WriteLine(Math.Round(number, 2))  Console.WriteLine(Math.Ceiling(number))  Console.WriteLine(Math.Floor(number)) |
| Truncate | Dim number As Single = -695.8945  Console.WriteLine(Math.Truncate(number)) |
| Random Number Generation | Randomize()  number = Int(Rnd() \* 50) + 1 |
| Substring | Dim word As String = "Guru998855"  Console.WriteLine(word.Substring(2, 6)) |
| Concatenation | Dim a As String = "butter"  Dim b As String = "fly"  Dim resultplus As String = a + b  Dim resultand As String = a & b  Console.WriteLine(resultplus)  Console.WriteLine(resultand.Length)  Console.WriteLine(String.Concat(a, b)) |
| Convert character to character code | Dim word As Integer = 78  Console.WriteLine(Chr(word)) |
| Convert character code to character | Dim word As Char = "G"  Console.WriteLine(Asc(word)) |
| Convert string to integer | Dim num As String = 5  Console.WriteLine(CInt(num))  Console.WriteLine(Integer.Parse(num)) |
| Convert integer to string | Dim num As Integer = 5  Console.WriteLine(num.ToString("00.00")) |
| Convert string to date-time | Dim datet As String = "2013- 1 - 5 13:56"  Console.WriteLine(Convert.ToDateTime(datet)) |
| Convert date-time to string | Dim datet As Date = "2013 / 1 / 5 13:56:23"  Console.WriteLine(datet.ToString("yyyy-MM-dd HH:mm:ss")) |
| Convert string to float ??? | Dim a As String = 4.0F  Dim b As String  Console.Writeline(CDbl(b)) |
| Convert float to string | Same as Integer to string  Dim num As Double = 5  Console.WriteLine(num.ToString("00.0")) |

# TASK 2: Boolean Operations (AND, OR, NOT & XOR)

**LESSON 1**

**Create a program that allows the user to input two values (or one value for NOT) and then carry out each of the relational operators returning an output of TRUE or FALSE. *Note: You may wish to use*** [***www.multiwingspan.co.uk***](http://www.multiwingspan.co.uk) ***and*** [***Code Project***](https://www.codeproject.com/Articles/544990/Understand-how-bitwise-operators-work-Csharp-and-V) ***to find out more about logic gates & logical bitwise operators.***

* **AND**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Code** | **Input A** | **Input B** | **Output** | **Evidence** |
| **Console.writeline(“Input A”)**  **A = console.readline()**  **Console.writeline(“input B”)**  **B= console.readline()**  **IF (A = 0) OR (B=0) then**  **Console.writeline(“0”)**  **Else**  **Console.writeline(“1”)**  **END IF** | **0** | **0** | **0** |  |
| **0** | **1** | **0** |  |
| **1** | **0** | **0** |  |
| **1** | **1** | **1** |  |

* **OR**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Code** | **Input A** | **Input B** | **Output** | **Evidence** |
| **Console.writeline(“Input A”)**  **A = console.readline()**  **Console.writeline(“input B”)**  **B= console.readline()**  **IF (A <> B) then**  **Console.writeline(“1”)**  **Else**  **Console.writeline(A)**  **END IF** | **0** | **0** | **0** |  |
| **0** | **1** | **1** |  |
| **1** | **0** | **1** |  |
| **1** | **1** | **1** |  |

* **NOT**

|  |  |  |  |
| --- | --- | --- | --- |
| **Code** | **Input A** | **Output** | **Evidence** |
| **Console.writeline(“Input A”)**  **A = console.readline()**  **IF A = 0 then**  **Console.writeline(“1”)**  **Else**  **Console.writeline(“0”)**  **END IF** | **0** | **1** |  |
| **1** | **0** |  |

* **XOR**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Code** | **Input A** | **Input B** | **Output** | **Evidence** |
| **Console.writeline(“Input A”)**  **A = console.readline()**  **Console.writeline(“input B”)**  **B= console.readline()**  **IF (A=B) then**  **Console.writeline(“0”)**  **Else**  **Console.writeline(“1”)**  **END IF** | **0** | **0** | **0** |  |
| **0** | **1** | **1** |  |
| **1** | **0** | **1** |  |
| **1** | **1** | **0** |  |

# TASK 3: String Handling

**LESSON 2**

**Create a program for each of the following questions. Copy and paste your code and place the screenshot of the output in the table below.**

|  |  |  |  |
| --- | --- | --- | --- |
| **Q. No** | **Question** | **Code** | **Evidence** |
| **1** | **Read in a string and work out how many characters it contains and then convert the entire string to upper case.** | Dim word As String = "this is word"  Console.WriteLine(word.Length())  Console.WriteLine(word.ToUpper())  Console.WriteLine(UCase(word))  Console.ReadLine() |  |
| **2** | **Write a program to read in a word and test if it is a palindrome (reads the same forwards as it does backwards).** | Dim word As String = "comeonnoemoc"  Dim back As String = StrReverse(word)  If word = back Then  Console.WriteLine("it is palindrome")  Else  Console.WriteLine("it is not")  End If  **Not-working version: why?**  **Try catch block**  Dim word As String = "happyyppah"  Dim front, back As String  If (word.Length() Mod 2) = 0 Then  front = word.Substring(0, (word.Length() / 2))  back = word.Substring((word.Length() / 2), word.Length())  Else  front = word.Substring(0, (word.Length() - 1 / 2))  back = word.Substring((word.Length() + 1 / 2), word.Length())  End If  Console.WriteLine("done")  Console.ReadLine() |  |
| **3** | **Create a program that extracts the vowels from the alphabet.** | Dim alpha() As String = {"a", "b", "c", "d", "e", "f", "g", "h", "i", "j", "k", "l", "m", "n", "o", "p", "q", "r", "s", "t", "u", "v", "w", "x", "y", "z"}  For Each search As String In alpha  Select Case search  Case "a"  Console.WriteLine("a")  Case "e"  Console.WriteLine("e")  Case "o"  Console.WriteLine("o")  Case "i"  Console.WriteLine("i")  Case "u"  Console.WriteLine("u")  End Select  Next  Console.ReadLine() |  |
| **4** | **The program will take the numbers 1-10 and extracts them into odd and even numbers.** | Dim odd As Single  For count As Integer = 0 To 10  odd = count Mod 2  Console.Write(count)  Select Case odd  Case 0  Console.WriteLine(" even")  Case 1  Console.WriteLine(" odd")  End Select  Next  Console.ReadLine() |  |
| **5** | **Set a string to the first line of the outrageous ditty below. Search for each of the spaces within the first line and use the Remove method to produce the whole rhyme.  OH NO JASPER DO NOT EAT THE FISH! OH NO JASPER DO NOT EAT THE!**  **OH NO JASPER DO NOT EAT!  OH NO JASPER DO NOT! OH NO JASPER DO! OH NO JASPER! OH NO! OH!** | Dim phase As String = "OH NO JASPER DO NOT EAT THE FISH"  Dim search As String = " "  Dim length As Integer = phase.Length()  Dim many As Integer = phase.LastIndexOf(search)  Do Until many = -1  Console.WriteLine(phase + "!")  If many <> -1 Then  phase = phase.Substring(0, many)  End If  many = phase.LastIndexOf(search)  Loop  Console.WriteLine(phase + "!")  Console.ReadLine() |  |