

Dear Parents / Students

Due to the unprecedented situation, Knowledgeplus Training center is mobilized and will keep accompanying and supporting our students through this difficult time.

Our Staff will be continuously, **sending notes and exercises on a weekly basis** through **what's app and emails**. Students are requested to **copy the notes and do the exercises** on their copybooks.

The answers to the questions below will be made available on our website on knowledgeplus.mu/support.php.

Please note that these are extra work and notes that we are providing our students and **all classes will be replaced during the winter vacation**.

We thank you for your trust and are convinced that, together, we will overcome these troubled times

IS Week 3

VB Programming Notes 4

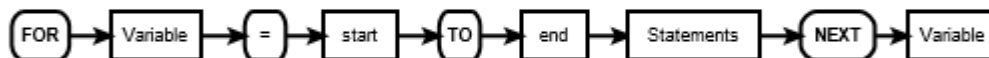
7. Iteration

Iteration is a technical work for doing something over and over again. This saves time by looping round code to do a task multiple times.

A loop is something that goes round and round and round. If I said move your finger around in a loop, you'd know what to do immediately. In programming, loops go round and round and round, too. In fact, they go round and round until you tell them to stop. You can programme without using loops. But it's an awful lot easier with them.

FOR loop

The fore loop repeats statements a set number of time. It uses a variable to count how many time it goes round the loop and stops when it reaches its limit.



```
Module Module1
    'Program to demonstrate the FOR loop
    'written by KPY
    'Date 12/2/1020

    Sub Main()
        Dim index As Integer

        For index = 1 To 20
            Console.WriteLine(index & " times 5 is " & index * 5)
        Next
        Console.ReadLine()
    End Sub
End Module
```

FOR STEP loop









You may not wish to count consecutively through this loop, for example you may wish to count every other number.


```
Dim index As Integer
'
For index = 2 To 10 Step 2
    Console.WriteLine(index)
Next
'
Console.ReadLine()
End Sub
```


Or you may wish to count backwards

```
Sub Main()
    Dim index As Integer
    '
    For index = 10 To 0 Step -2
        Console.WriteLine(index)
    Next
    '
    Console.ReadLine()
End Sub
```

Programming Projects

-  Write a program that displays the word 'Hello' on the screen 4 times on the same line using the for loop.
-  Write a program that prompts the user to enter a short message and the number of times it is to be displayed and then displays the message the required number of times.
-  Write a console application to calculate the 8 times table
-  Write a console application that will ask for 10 numbers. The program will then display the sum of these numbers and the average.
-  Write a program that asks for a number, and displays the squares of all the integers between 1 and this number inclusive.
-  Write a program to display the squares of all the integers from 1 to 12 in two columns headed 'Number' and 'Square of Number'.
-  Write a program that displays all the numbers between 1 and 10,000. How long did it take to execute?
-  Write a program that displays all even numbers between 1 and 10,000. How long did it take to execute?


 Write a console application that will ask for 10 numbers. The program will then display the max and min value entered (you will need to use an IF statement and variables to hold the max and min values)


 n factorial, usually written n!, is defined to be the product of all the integers in the range 1 to n:


$$n! = 1 * 2 * 3 * 4 * \dots * n$$

Write a program that calculates n! for a given positive n.

Challenging Projects

 Write a program that asks for a number and converts this into a binary number. You will need to use \ and mod.

 Write a program that shows the first 10 numbers in the Fibonacci series.

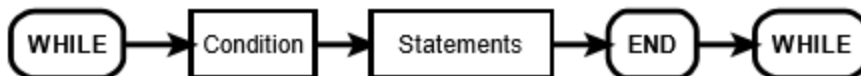
 A prime number is a number that can only be divided by the number itself and 1. Write a program that displays all the prime numbers between 2 and 1000.

WHILE loop

The while loop is known as a **test before loop**. The condition is tested before entering the loop, but tested each time it goes round the loop.

The number of times the statements within the loop are executed varies. The test before loop goes round 0 or more times.

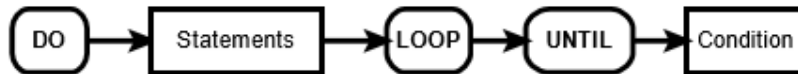
This method is useful when processing files and using "read ahead" data



```
Sub Main()  
    Dim name As String  
  
    name = Console.ReadLine()  
    'Test before loop -  
    'only enter the loop is name not equal "X"  
    While name <> "X"  
        Console.WriteLine(name)  
        name = Console.ReadLine()  
    End While  
  
End Sub
```

REPEAT loop

The repeat loop is similar to the while loop, but it tests the condition after the statements have been executed once. This means that this test after loop goes round 1 or more times.



```
Sub Main()  
    Dim name As String  
  
    Do  
        name = Console.ReadLine()  
        Console.WriteLine(name)  
    Loop Until name = "X"  
    'Test after loop  
  
End Sub
```

Programming Projects



Write a program that reads in a series of numbers and adds them up until the user enters zero. (This stopping value is often called a **rogue value**.) You may assume that at least 1 number is entered.

Expand your program to display the average as well as the sum of the numbers entered. Make sure you do not count the rogue value as an entry.



Write a program that asks the user for a number between 10 and 20 inclusive and will validate the input. It should repeatedly ask the user for this number until the input is within the valid range.

Make changes to your program so it will also work if the user does not want to type in any numbers and uses the rogue value straight away.



Write a program that displays a conversion table for pounds to kilograms, ranging from 1 pound to 20 pounds [1 kg = 2.2 pounds].



Write a program that asks the user to enter 8 integers and displays the largest integer.

Adapt your program so that the user can type in any number of positive integers. Input will terminate with the rogue value of—1.

Adapt your program so that it will also display the smallest integer.

Adapt your program from if necessary, so that it works if the user types in the rogue value as the first value

Challenge Project



Write a game in which the user guesses what random number between 1 and 1000 the computer has 'thought of', until he or she has found the correct number. The computer should tell the user whether each guess was too high, too low or spot on. (TIP: use the Maths library, which has a random function. See page 18)