**Looping Statements**

1. **Looping**

Looping is the process of repeating a series of statements multiple times until a criteria is met.

1. **Controlling Loops**

* Counter-controlled loops repeat a specific number multiple of times. It is useful when the programmer knows how many times the loop should be executed.
* Initialize the counter by setting it to a beginning value before entering the loop.
* The counter is incremented (or decremented) by the same value during each repetition.

1. **Basic Components of Loops**

* Loop control variable: A variable used to determine whether a loop will be executed.
* Loop body: The statement (s) that are executed each time a loop repeats.

1. **Types of loop Structures**

* Do While ……. Loop
* Do Until …… Loop
* For …… Next loop
  1. **Do While ……. Loop**
* Is executed as long as the condition is True.
* If condition is False then the next statement after the Loop is executed

*The format of the Do While ……. Loop is as follow:*

**Do While condition is true**

**(Statement(s**

**Loop**

*And the counter format is as follow:*

**Counter Variable=Start Value**

**Do While(Counter Variable <=End Value)**

**.**

**.**

**Counter Variable=** **Counter Variable + Step\_size**

**loop**

**.**

**…..,,,,**

***Example1:***

Write a VB program to find S from the following series:

Find the value of S for each input values of a ,b and n.

Solution :

Private Sub Form\_Click()

Dim a, b, n As Single

Dim I As Integer

a = Val(InputBox("enter the value of a"))

b = Val(InputBox("enter the value of b"))

n = Val(InputBox("enter the value of n"))

s = 0

I = 1

Do While (I <= n(

s = s + (I / ((a + b) ^ I((

I = I + 1

Loop

Print a; b; n; s

End Sub

* 1. **Do Until ……. Loop**
* Is executed until the condition becomes True
* Any Do While…. Loop can be rewritten as a Do Until ….. Loop.

*The format of the Do Until……. Loop is as follow:*

**Do Until condition is true**

**(Statement(s**

**Loop**

*And the counter format is as follow:*

**Counter Variable=Start Value**

**Do Until(Counter Variable >End Value)**

**.**

**.**

**Counter Variable=** **Counter Variable + Step\_size**

**loop**

**.**

***Example2:***

Write a VB program ask the officer to enter his name (N), his age (A), and his salary (F). If you know that this salary is increased 5% per year. Find And print the overall salaries that this officer can get it until he reached the retirement age (65) years.

***Solution:***

Private Sub Form\_Click()

Dim N As String

Dim A As Integer

Dim F As Single

N= InputBox("enter officer name")

A= Val(InputBox("enter officer age"))

F = Val(InputBox("enter officer first salary"))

Do Until (A > 65)

F = F + 0.05 \* F

A= A + 1

Loop

Print N; F

End Sub

* 1. **For … Next Loop Statement**

A loop where the number of iterations is determined by a range of values for a numeric variable.

*The format of the For … Next Loop is as follows:*

**For conunterVariable =** Start Value **TO** EndValue

**statement(s(**

**Next counterVariable**

***Example3:***

Write a VB program to find the factorial of any integer number(N!).

Hint: Factorial=1×2×3×……..×N

***Solution:***

Private Sub Form\_Click()

Dim N, I As Integer

Dim F As Single

N = Val(InputBox("enter the value of N"))

F = 1

I = 1

For I = 1 To N

F = F \* I

Next I

Print "Factorial of "; N; "="; F

End Sub

1. **Comparing While… and Until Loops**
2. The Do While … Loop executes while the condition is true.
3. The Do Until….. Loop executes until the condition is true.
4. Both can be used to create any type of loop.

***Homework:***

Write a VB program to find the following series up to 100 terms:

Input *x* and n via input boxes then, display the result of series in text box.

Solution :

Dim x, y As Single

Dim n As Integer

Dim S As Single

Private Sub Form\_Click()

Text1.Text= " "

pie = 3.14

x = Val(InputBox("enter the value of x"))

y = x \* (pie / 180(

n = Val(InputBox("enter the value of n"))

S = 1: K = 1: I = 2

Do While I <= n

FAC = 1

For J = 1 To I

FAC = FAC \* J

Next J

S = S + ((y ^ I / FAC) \* (-1) ^ K(

K = K + 1

I = I + 2

Loop

Text1.Text = Val(S(

End Sub