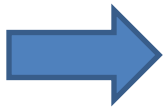
Other uses of loops

- So far we have only seen examples of loops being used in order to compute sums.
- However loops can be used in any programme that requires some operation to be carried out recursively.

Example: write down a programme that computes the n-fold composition of the function f(x)=x(x-1).

What we want to compute is f(f(f(f…(x)…))) (n times)
This can be easily done with a loop. We will write a UDF
Depending on two variables x and n which computes this.
One possible code would be…

```
Function nfold(n as Integer, x as Single) as Single
    a = 1
    Do Until a = n + 1
        x= x*(x-1)
        a = a + 1
    Loop
    nfold=x
End Function
```

=nfold(30,0.5)  0.122558…

- If we look at the structure of the loop in more detail we have:

```
a = 1
Do Until a = n + 1
   x=x*(x-1)
   a = a + 1
Loop
nfold=x
```

•The variable “a” here is just a counter (it counts how many times we carry out the composition of the function).

•When we write “x=f(x)” what we are saying is that the next time the loop is carried out the original variable “x” should be replaced by the new value “f(x)”.

•Once this process has been carried out n times, the program leaves the loop and finally assigns the last value of “x” to the value of the function we want to compute (nfold).