uFormat$() and StrE$() provide flexible formatting of numeric values

Some languages provide the FORMAT$() function - indeed this features in MMBasic for the MaxiMite but has been dropped from versions intended for the MicroMite (V4.5 onward). It can be an intensive function for some often quite fringe functions. A fully fledged version is documented here. I think you'll agree it is a lot of work for often little payback... fine on PC's with multi-gigabyte memories but not really worth the flash in confined systems when the function is rarely used.

In MMBasic, the STR$() function does provide a lot of the numerical formatting but still misses a couple of types aimed specifically at engineering tasks.

Below are two functions that provide the most common formatting options for decimal numbers, allowing numeric values to be returned (as a string) correctly formatted. Both functions are reproduced here courtesy of The Back Shed user; TassyJim and the original threads can be found here and here.

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uFormat$()

This function formats a value to the nearest number of decimal places required. It will round the number up or down to do this i.e. if you ask for the value 5900 rounded to the nearest thousand (negative option) the returned value will be 6000 and so on.

Example Code

```
    For p = -3 TO 3
        Print uFormat$(6258.990876,p)
    Next p
```

The output illustrates the action of the formatting option:

```
6000
6300
6260
6259
6259.0
6258.99
6258.991
```

Dependencies

None.

```
' The function
    Function uFormat$(x,p)
        ' given a number (x) and the required number of decimal places (p)
```

```
        ' returns formatted string. Negative and zero p is permitted
        Local f$
        f$=Str$(Cint(x*10^p))
        If Len(f$)<=p Then
            f$=String$(p+1-Len(f$), "0")+f$
        EndIf
        If p>0 Then
            uFormat$=Left$(f$,Len(f$)-p)+"."+Right$(f$,p)
        ElseIf p = 0 Then
            uFormat$=f$
        Else
            uFormat$=f$+String$(Abs(p),"0")
        EndIf
    End Function
```

StrE$()

Is an enhanced form of the STR$() function that returns a numeric value using scientific/engineering notation - that is a value and exponent. Engineering notation groups number by thousands e.g. 100,000 will be returned as 100e+3 whereas in scientific notation, the same value would be return as 1e+5, always reducing the value to between 0 and 9.9999»

Example Code

```
    q=.000001
        Print StrE$(q,1,1),,StrE$(q,5,0)
    q=.0001
        Print StrE$(q,2,1),,StrE$(q,5,0)
    q=.01
        Print StrE$(q,3,1),,StrE$(q,5,0)
    q=.455
        Print StrE$(q,4,1),,StrE$(q,5,0)
    q=0
        Print StrE$(q,4,1),,StrE$(q,5,0)
    q=1
        Print StrE$(q,5,1),,StrE$(q,5,0)
    q=7748
        Print StrE$(q,6,1),,StrE$(q,5,-1)
    q=100000
        Print StrE$(q,7,1),,StrE$(q,5,-1)
    q=2200000
        Print StrE$(q,8,1),,StrE$(q,5,0)
```

Again, the output illustrates the action of the formatting options (note also how the formatting can expose the limitations of single precision Floating Point maths):

```
1.0e-6      1.00000e-6
 100.00e-6      1.00000e-4
 10.000e-3      1.00000e-2
 455.0000e-3        4.55000e-1
 0.0000         0.00000
 1.00000e0      1.00000e0
 7.748000e3     7.74800e3
 99.9999923e3       100.00000e3
 2.20000004e6       2.20000e6
```

Dependencies

None.

```
' the function
    Function strE$(mx,p,eng)
        ' mx = number to format
        ' p = number of decimal places
        ' if eng is not zero, use engineering notation
        Local sn$
        Local Float x,px
        sn$=" "
        x=mx
        If x<0 Then
            sn$="-"
            x=x*-1
        EndIf
        If x<>0 Then  ' zero is a special case
            px=Int(Log(x)/Log(10))
            If eng<>0 Then ' engineering notation - multiples of 3
                px=Int(px/3)*3
            EndIf
            x=x*(10^-px)
            strE$=sn$+Str$(x,0,p)+"e"
            ' if Sgn(Int(px))<>-1 Then strE$=strE$+"+"  ' un-REM this line
to force the exponent sign e.g. 1e+6 instead of 1e6
            strE$=stre$+Str$(Int(px))
        Else
            strE$=sn$+Str$(x,0,P)
        EndIf
    End Function
```