HP-12C ⌈ΔDYS⌉ with European 30/360 outputs

Tony Hutchins, #1049

European markets still make use of two 30 day month/360 day year methods, called 30(E)/360 and 30(E+)/360, for counting days between dates, denoted by Date1 and Date2 below, where Date1 is the earlier of the two. The HP-12C provides the USA 30(A)/360 result. The program below may be run instead of executing ⌈ΔDYS⌉ to get the usual ⌈ΔDYS⌉ output and in addition the 30(E) and 30(E+) results are then stored in R_0 and R_1.

	Examples of usage	Do→	⌈x≷y⌉	⌈RCL⌉0	⌈RCL⌉1
	Do⌈g⌉⌈D.MY⌉ &↓ See→	Actual	30(A)	30(E)	30(E+)
1	15.032⌈ENTER⌉31.032⌈R/S⌉	16	16	15	16
2	31.032⌈ENTER⌉15.092⌈R/S⌉	168	165	165	165
3	15.032⌈ENTER⌉15.092⌈R/S⌉	184	180	180	180
4	30.032⌈ENTER⌉31.072⌈R/S⌉	123	120	120	121

Examples 1,2 and 3 show how the 30(A) and 30(E+) methods can result in the whole (180) not being the sum of the parts (16 +165=181). "Agency" bonds in the USA (now called "Government Sponsored Enterprise Debt") valued on 31st March with maturity on 15th September would have the 16 days used as the accrual period and the 165 days as the discount period, whereas a "Muni" bond valuation would use 180-16=164 as the discount period. The 30(E) method, used for Swedish, Swiss and Danish bonds and also for Eurobonds and Irish bonds issued before 1999, does not have this apparent drawback. Example 4 shows a case where the 30(E+) method gives the biggest result.

Press	Display	Press	Display	Press	Display
⌈ENTER⌉	01- 36	⌈x≷y⌉	10- 34	⌈STO⌉⌈X⌉0	19-44 20 0
⌈g⌉⌈INTG⌉	02- 43 25	⌈g⌉⌈INTG⌉	11- 43 25	⌈R↓⌉	20- 33
3	03- 3	3	12- 3	⌈g⌉⌈ΔDYS⌉	21- 43 26
1	04- 1	0	13- 0	⌈x≷y⌉	22- 34
⌈÷⌉	05- 10	⌈÷⌉	14- 10	⌈STO⌉⌈+⌉0	23-44 40 0
⌈g⌉⌈INTG⌉	06- 43 25	⌈g⌉⌈INTG⌉	15- 43 25	⌈STO⌉⌈+⌉1	24-44 40 1
⌈STO⌉0	07- 44 0	⌈STO⌉⌈X⌉1	16-44 20 1	⌈x≷y⌉	25- 34
⌈STO⌉1	08- 44 1	1	17- 1	⌈g⌉⌈GTO⌉00	26-43,33 00
⌈R↓⌉	09- 33	⌈−⌉	18- 30	⌈f⌉⌈P/R⌉	

The program assumes D.MY is set, and that is the format used for input. If Date1 has Y1=year, M1=month and D1=day, and similarly for Date2, then 30(K)= 360(Y2−Y1)+30(M2−M1)+D2−D1+INT(D1/31)−K·INT(D2/31) where K=0 for 30(E+), K=1 for 30(E) and K=INT(D1/30) for the 30(A). In general: 30(E) <=30(A) <=30(E+). The methods differ only when Date2 is a 31st.

Reference: "Mastering Financial Calculations", by Robert Steiner. 1999. FT Prentice Hall. Includes some HP12C, 17B and 19B methods. Excellent book!