Number Cruncher

The three programs presented here, for the BBC Microcomputer Spectrum and Commodore, accept decimal numbers, and deliver in return their binary equivalent

Commodore 64

```
10 REM********COMMODORE**********
40 S$="                ":X$="0123456789ABCDEF"
50 REM    S$ CONTAINS 9 SPACES
60 PRINT CHR$(147)    :REM CLEAR SCREEN
70 PRINT "          TO DISPLAY DECIMAL NUMBER
S"
80 PRINT "      AND THEIR BINARY EQUIVALEN
TS"
90 PRINT:PRINT "    ********ENTER 0 TO QUI
T********":PRINT
100 FOR K=1 TO 1
110 FOR L=1 TO 1
120 INPUT"TYPE ANY POSITIVE WHOLE NUMBER
 ";A$
130 NU=VAL(A$)
140 IF NU=0 THEN PRINT "PROGRAM EXIT":ST
OP
150 IF INT(NU)<>ABS(NU) THEN L=0
160 IF NU>65535 THEN PRINT NU;" IS TOO B
IG":L=0
170 NEXT L
200 NM=NU:H$="":GOSUB 2000
210 PRINT NU;TAB(5);N$;
220 IF RIGHT$(A$,1)="+" THEN GOSUB 4000
230 PRINT H$:PRINT:PRINT
240 K=0:NEXT K
250 END
300 END
1000 REM******BINARY BYTE S/R*******
1010 B$=""
1020 FOR D=8 TO 1 STEP-1
1030 N1=INT(N/2)
1040 R=N-2*N1
1050 B$=MID$(STR$(R),2)+B$
1060 N=N1
1070 NEXT D
1080 RETURN
2000 REM****BINARY CONVERSION S/R***
2010 IF NM<256 THEN N=NM:GOSUB 1000:N$=S
$+B$:RETURN
2020 HI=INT(NM/256):LO=NM-256*HI
2030 N=HI:GOSUB 1000:N$="= "+B$
2040 N=LO:GOSUB 1000:N$=N$+" "+B$
2050 RETURN
3000 REM****HEX BYTE S/R*********
3010 HB=INT(N/16):LB=N-HB*16
3020 B$=MID$(X$,HB+1,1)+MID$(X$,LB+1,1)
3030 RETURN
4000 REM****HEX CONVERSION S/R******
4010 IF NM<256 THEN N=NM:GOSUB 3000:H$="
=  "+B$:RETURN
4020 HI=INT(NM/256):LO=NM-256*HI
4030 N=HI:GOSUB 3000:H$="= "+B$
4040 N=LO:GOSUB 3000:H$=H$+" "+B$
4050 RETURN
```

BBC Micro

Copy the Commodore list with the following changes:

```
60 CLS:@%=5
210 PRINT TAB(0);NU;TAB(5);N$;
1050 B$=STR$(R)+B$
```

This program does not use the BBC's number representation facilities for the sake of compatibility of format with the other machines; you may be able to rewrite it in a shorter form.

Spectrum

```
10 REM*******SPECTRUM*********
40 LET S$="=              ":LET X$="0
123456789ABCDEF"
50 REM   S$ CONTAINS 9 SPACES
60 CLS
70 PRINT "  TO DISPLAY DECIMAL N
UMBERS"
80 PRINT " AND THEIR BINARY EQUI
VALENTS"
90 PRINT:PRINT " *******ENTER 0
TO QUIT********":PRINT
100 FOR K=1 TO 1
110 FOR L=1 TO 1
120 INPUT"TYPE ANY POSITIVE WHOL
E NUMBER ";A$
130 LET NU=VAL(A$)
140 IF NU=0 THEN PRINT "PROGRAM
EXIT":STOP
150 IF INT(NU)<>ABS(NU) THEN LET
 L=0
160 IF NU>65535 THEN PRINT NU;"
IS TOO BIG":LET L=0
170 NEXT L
200 LET NM=NU:LET H$="":GOSUB 20
00
210 PRINT NU;TAB(5);N$;
220 IF A$(LEN A$)="+" THEN GOSUB
 4000
230 PRINT H$:PRINT:PRINT
240 LET K=0:NEXT K
300 END
1000 REM**BINARY BYTE S/R**
1010 LET B$=""
1020 FOR D=8 TO 1 STEP-1
1030 LET N1=INT(N/2)
1040 LET R=N-2*N1
1050 LET B$=STR$(R)+B$
1060 LET N=N1
1070 NEXT D
1080 RETURN
2000 REM**BINARY CONVERS S/R**.
2010 IF NM<256 THEN LET N=NM:GOS
UB 1000:LET N$=S$+B$:RETURN
2020 LET HI=INT(NM/256):LET LO=N
M-256*HI
2030 LET N=HI:GOSUB 1000:LET N$=
"= "+B$
2040 LET N=LO:GOSUB 1000:LET N$=
N$+" "+B$
2050 RETURN
3000 REM****HEX BYTE S/R******
3010 LET HB=INT(N/16):LET LB=N-H
B*16
3020 LET B$=X$(HB+1)+X$(LB+1)
3030 RETURN
4000 REM***HEX CONVERS S/R****
4010 IF NM<256 THEN LET N=NM:GOS
UB 3000:LET H$="=    "+B$:RETURN
4020 LET HI=INT(NM/256):LET LO=N
M-256*HI
4030 LET N=HI:GOSUB 3000:LET H$=
"= "+B$
4040 LET N=LO:GOSUB 3000:LET H$=
H$+" "+B$
4050 RETURN
```

If you input a number with a "+" on the end, for example: 6435+, then in addition to its decimal and binary representation, its hex representation will also be displayed.