Computer Science 125

Binary, Decimal, and Hexidecimal Numbers

1. Convert the following binary numbers to decimal.

(a) 101 (4 2 1) $4 + 1 = \boxed{5_{dec}}$

(b) 101111 (32 16 8 4 2 1) $32 + 8 + 4 + 2 + 1 = \boxed{47_{dec}}$

2. Convert the following decimal numbers to binary.

(a) 19 $2\overline{)19}$ R1, $2\overline{)9}$ R1, $2\overline{)4}$ R0, $2\overline{)2}$ R0, $2\overline{)1}$ R1 $\boxed{10011_{bin}}$

(b) 65 $2\overline{)65}$ R1 ...etc... $\boxed{1000001_{bin}}$

hexadecimal decimal

A → 10
B → 11
C → 12
D → 13
E → 14
F → 15

3. Convert the following hexadecimal numbers to decimal.

(a) 2C $2(16) + 12(1) = \boxed{44_{dec}}$

(b) 3A9 $3(256) + 10(16) + 9(1) = \boxed{937_{dec}}$

4. Convert the following decimal numbers to hexadecimal.

(a) 12 $\boxed{C_{hex}}$

(b) 2063 $16\overline{)2063}$ R:15 (F), $16\overline{)128}$ R:0, $16\overline{)8}$ R:8 $\boxed{80F_{hex}}$

5. Convert the following hexadecimal numbers to binary. (You could convert them to decimal first, but can you think of a more efficient way?)

(a) 4C $4_{hex} = 100_{bin}$ and $C_{hex} = 1100_{bin}$, so $\boxed{100\ 1100_{bin}}$

(b) 3AF0 $\boxed{11\ 1010\ 1111\ 0000_{bin}}$

6. Convert the following binary numbers to hexadecimal. (What is the most efficient way you can think of to do this?)

(a) 10000 $\boxed{10_{hex}}$

(b) 1011 1010 0111 $\boxed{BA7_{hex}}$