Kasus Representasi Informasi

Binary Numbers : Octal and Hexa

1. Convert the following octal numbers to binary :
   a. 17670
   b. 4005
   c. 212077
2. Convert the following binary numbers to both octal and hexadecimal :
   a. 111011
   b. 1010101110100
   c. 110101111110
3. Convert the following hexadecimal numbers to binary :
   a. 1A2B
   b. 77760
   c. FEED

Binary Numbers : Octal and Hexa

4. Your computer stores numbers intenally using twenty binary digits. The bit positions are numbered left to right beginning with 0. The rightmost bit is bit 19. What is the internal value of bit position 7 if the decimal contents of the cell is 94,275? What is the internal value of bit position 9 if the hexadecimal contents of the cell 2E6A5? How easy were these two operations? What does this tell you about the major use of hexadecimal (and octal) ?

Signed Binary, 1's and 2's Compl.

5. Assume $m = 8$. Show how to represent the following decimal values in sign/magnitude notation.
   a. -7
   b. -101
   c. -201
6. Assume $m = 10$. Show how to represent the following decimal values in twos complement notation.
   a. -201
   b. -15
   c. -700
7. Assume $m = 12$. What is the value of -250_{10} in Sign/Magnitude, two's and one's complement ?
8. If $m = 12$, what is the largest (in absolute value) positive and negative quantity that can be represented in sign/magnitude notation and twos complement?

Twos complement

9. Perform the following binary additions in twos complement. For each one, state whether there is a carry, an overflow, or both. Convert both operands and the result back to decimal as a check. Assume $m = 5$.

a.
$$\begin{array}{r} 00110 \\ +\ 01110 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 10100 \\ +\ 01111 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 10111 \\ +11110 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 10000 \\ +10000 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 00001 \\ +01010 \\ \hline \end{array}$$

f.
$$\begin{array}{r} 11111 \\ +11111 \\ \hline \end{array}$$

Twos complement

10. Perform the following binary additions in twos complement. For each one, state whether there is a carry, an overflow, or both. Convert both operands and the result back to decimal as a check. Assume $m = 5$.

a.
$$\begin{array}{r} 00111 \\ -\ 00101 \\ \hline \end{array}$$

b.
$$\begin{array}{r} 00001 \\ -\ 11111 \\ \hline \end{array}$$

c.
$$\begin{array}{r} 00101 \\ -\ 00111 \\ \hline \end{array}$$

d.
$$\begin{array}{r} 10000 \\ -\ 11111 \\ \hline \end{array}$$

e.
$$\begin{array}{r} 10011 \\ -\ 01011 \\ \hline \end{array}$$

f.
$$\begin{array}{r} 11110 \\ -\ 11111 \\ \hline \end{array}$$

Signed Binary, 1's and 2's Compl.

11. Perform the following arithmatic in Sign/magntude, one complement and twos complement. For each one, state whether there is a carry, an overflow, or both. Convert both operands and the result back to decimal as a check. Assume $m = 8$.

a.

	Decimal	Sign/magnitude	Ones complement	Twos complement
	7	.....	.....	.....
+	8	.....	.....	.....
	.....	.....	.....	.....

b.

	Decimal	Sign/magnitude	Ones complement	Twos complement
	12	.....	.....	.....
+	14	.....	.....	.....
	.....	.....	.....	.....

Cont.

c.

	Decimal	Sign/magnitude	Ones complement	Twos complement
	12	.....	.....	.....
+	-8	.....	.....	.....
	.....	.....	.....	.....

d.

	Decimal	Sign/magnitude	Ones complement	Twos complement
	6	.....	.....	.....
+	-10	.....	.....	.....
	.....	.....	.....	.....

Binary Coded Decimal (BCD)

12. What is 3450_{10} in BCD ?
13. What is -899_{10} in BCD ?
14. (+74) + (+49) in BCD ?
15. What is advantage of using BCD ?
16. What is disadvantage of using BCD ?

Floating Point

17. Convert the following fractional decimal values to binary

    a. 0.7

    b. 0.001

    c. 0.4

    d. 0.153827

Floating Point

18. Convert the following fractional binary values to decimal
    a. 0.110010
    b. 0.00001
    c. 0.1110001
    d. 0.101

Floating Point

19. Normalize the following binary values so that they meet the definition of normalization

    a. 0.0001 (B = 2)

    b. 110.01 (B = 2)

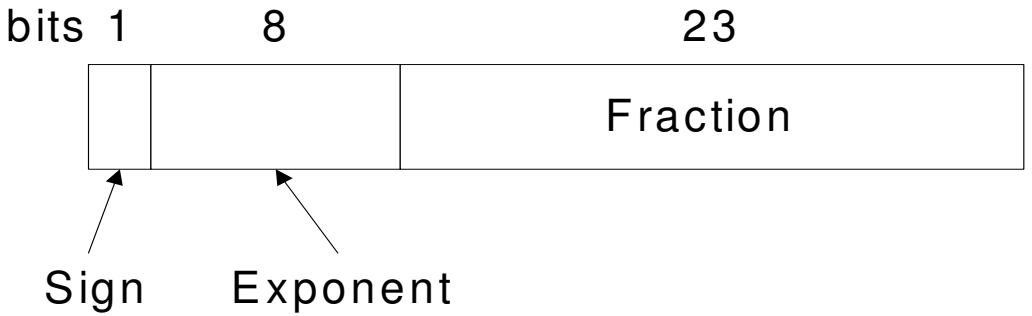
    c. 0.001101 (B = 4)

    d. 101.101 (B = 8)

    e. 0.00000001 (B = 16)

Floating Point

20. Misalkan sebuah Mesin X memiliki ukuran 32-bit untuk merepresentasikan bilangan floating point dengan format ieee754



Maka representasikan bilangan **–0.2187510** pada mesin X, kemudian konversikan ke Basis bilangan 8 dan 16