

Keith A. Kurtz
CS 42
Assig. 1

3)	Dec	16	17	18	19	20	21
	Bin	10000	10001	10010	10011	10100	10101
	Oct	20	21	22	23	24	25
	Hex	10	11	12	13	14	15
	Dec	22	23	24	25	26	27
	Bin	10110	10111	11000	11001	11010	11011
	Oct	26	27	30	31	32	33
	Hex	16	17	18	19	1A	1B
	Dec	28	29	30	31		
	Bin	11100	11101	11110	11111		
	Oct	34	35	36	37		
	Hex	1C	1D	1E	1F		

$$\begin{aligned} 4) \quad 96K &= 96 \times 2^{10} \\ &= 96 \times 1,024 \text{ (use Table 1-2)} \\ &= 98,304 \text{ bits} \end{aligned}$$

$$\begin{aligned} 640M &= 640 \times 2^{20} \\ &= 640 \times 1,048,576 \\ &= 671,088,640 \text{ bits} \end{aligned}$$

$$\begin{aligned} 4G &= 4 \times 2^{30} \\ &= 4 \times 1,073,741,824 \\ &= 4,294,967,296 \text{ bits} \end{aligned}$$

Keith A. Kuntz
Assig. 1

$$\begin{array}{ll} 6.) & 11 \text{ bits} & 2^{11} - 1 = 2,047 \\ & 25 \text{ bits} & 2^{25} - 1 = 33,554,431 \end{array}$$

$$\begin{aligned} 7.) & (1001101)_2 = 2^6 + 2^3 + 2^2 + 2^0 \\ & = 64 + 8 + 4 + 1 \\ & = 77 \end{aligned}$$

$$\begin{aligned} & (1010011.101)_2 = 2^6 + 2^4 + 2^1 + 2^0 + 2^{-1} + 2^{-3} \\ & = 64 + 16 + 2 + 1 + 0.5 + 0.125 \\ & = 83.625 \end{aligned}$$

$$\begin{aligned} & (10101110.1001)_2 = 2^7 + 2^5 + 2^3 + 2^2 + 2^1 + 2^{-1} + 2^{-4} \\ & = 128 + 32 + 8 + 4 + 2 + 0.5 + 0.0625 \\ & = 174.5625 \end{aligned}$$

Keith Kuntz
Assig 1

$$\begin{array}{rcll} 8) & 193 - 128 & = & 65 & 2^7 \\ & 65 - 64 & = & 1 & 2^6 \\ & 1 - 1 & = & 0 & 2^0 \end{array}$$

$$(193)_{10} = (11000001)_2$$

$$\begin{array}{rcll} 751 - 512 & = & 239 & 2^9 \\ 239 - 128 & = & 111 & 2^7 \\ 111 - 64 & = & 47 & 2^6 \\ 47 - 32 & = & 15 & 2^5 \\ 15 - 8 & = & 7 & 2^3 \\ 7 - 4 & = & 3 & 2^2 \\ 3 - 2 & = & 1 & 2^1 \\ 1 - 1 & = & 0 & 2^0 \end{array}$$

$$(751)_{10} = (1011101111)_2$$

$$\begin{array}{rcll} 2007 - 1024 & = & 983 & 2^{10} \\ 983 - 512 & = & 471 & 2^9 \\ 471 - 256 & = & 215 & 2^8 \\ 215 - 128 & = & 87 & 2^7 \\ 87 - 64 & = & 23 & 2^6 \\ 23 - 16 & = & 7 & 2^4 \\ 7 - 4 & = & 3 & 2^2 \\ 3 - 2 & = & 1 & 2^1 \\ 1 - 0 & = & 0 & 2^0 \end{array}$$

$$(2007)_{10} = (11111010111)_2$$

Keith Kuntz
Assig. 1

$$\begin{array}{r r r r r}
 19,450 - 16,384 & = & 3,066 & & 2^{14} \\
 3,066 - 2,048 & = & 1,018 & & 2^{11} \\
 1,018 - 512 & = & 506 & & 2^9 \\
 506 - 256 & = & 250 & & 2^8 \\
 250 - 128 & = & 122 & & 2^7 \\
 122 - 64 & = & 58 & & 2^6 \\
 58 - 32 & = & 26 & & 2^5 \\
 26 - 16 & = & 10 & & 2^4 \\
 10 - 8 & = & 2 & & 2^3 \\
 2 - 2 & = & 0 & & 2^1
 \end{array}$$

$$(19,450)_{10} = (10010111111010)_2$$

9.) Convert all numbers to binary:

$$\begin{array}{r r r r r}
 369.3125 - 256 & = & 113.3125 & & 2^8 \\
 113.3125 - 64 & = & 49.3125 & & 2^6 \\
 49.3125 - 32 & = & 17.3125 & & 2^5 \\
 17.3125 - 16 & = & 1.3125 & & 2^4 \\
 1.3125 - 1 & = & 0.3125 & & 2^0 \\
 0.3125 - 0.25 & = & 0.0625 & & 2^{-2} \\
 0.0625 - 0.0625 & = & 0 & & 2^{-4}
 \end{array}$$

$$(369.3125)_{10} = (101110001.0101)_2$$

$$(326.5)_8 = (011010110.101)_2$$

$$(F3C7.A)_{16} = (111100111000111.1010)_2$$

Keith A. Kuntz
Assig. 1

Convert binary numbers to decimal

$$(10111101.101)_2 = 2^7 + 2^5 + 2^4 + 2^3 + 2^2 + 2^0 + 2^{-1} + 2^{-3} \\ = (189.625)_{10}$$

$$(11010110.101)_2 = 2^7 + 2^6 + 2^4 + 2^2 + 2^1 + 2^{-1} + 2^{-3} \\ = (214.625)_{10}$$

$$(111100111000111.101)_2 \\ = 2^{15} + 2^{14} + 2^{13} + 2^{12} + 2^9 + 2^8 + 2^7 + 2^6 + 2^2 \\ + 2^1 + 2^0 + 2^{-1} + 2^{-3} = (62407.625)_{10}$$

<u>DEC</u>	<u>BIN</u>	<u>OCT</u>	<u>HEX</u>
369.3125	101110001.0101	561.24	171.5
189.625	10111101.101	275.5	BD.A
214.625	11010110.101	326.5	D6.A
62407.625	1111001111000111.101	171707.5	F3C7.A

Keith Kuntz
Assig. 7

12) a)

$$\begin{array}{r} 1101 \\ \times 1011 \\ \hline 1101 \\ 1101 \\ 0000 \\ 1101 \\ \hline 10001111 \end{array}$$

b)

$$\begin{array}{r} 0101 \\ \times 1010 \\ \hline 0000 \\ 0101 \\ 0000 \\ 0101 \\ \hline 0110010 \end{array}$$

c)

$$\begin{array}{r} 100111 \\ \times 011011 \\ \hline 100111 \\ 100111 \\ 000000 \\ 100111 \\ 100111 \\ 000000 \\ \hline 10000011101 \end{array}$$

100

Keith A. Kurtz
 Assig. 2

23)

	h.o. bit low		h.o. bit set to even parity	
K	0100	1011	0100	1011
e	0110	0101	0110	0101
i	0110	1001	0110	1001
t	0111	0100	0111	0100
h	0110	1000	1110	1000
	0010	0000	1010	0000
A	0100	0001	0100	0001
.	0010	1110	0010	1110
	0010	0000	1010	0000
K	0100	1011	0100	1011
v	0111	0101	1111	0101
r	0111	0010	0111	0010
t	0111	0100	0111	0100
z	0111	1010	1111	1010

24)

100	0111	G
110	1111	o
010	0000	SP
100	0010	B
110	0001	a
110	0100	d
110	0111	g
110	0101	e
111	0010	r
111	0011	s
010	0001	!