EGC220
Class Notes
1/31/2023

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$$(45.5)_D \rightarrow (\quad)_2, (\quad)_8, (\quad)_{16}$$

2^1 $4 = 2^{②}$ ③ 2 ④ 2

$45 \div 16 = 2 \quad R_0 = D$

$2 \div 16 = 0 \quad R_1 = 2$

$.5 \times 16 = 8.0 \leftarrow stop$

$(2D.8)_{16}$

32	16	8	4	2		.	5
D 0	1	0	1	1	0	.	1000

$(2D.8)_{16}$

(101101.100) 5 5 .4/8

$x2$

$(101101.10$ $2 3 1. 2)_4$

$$(25.6)_8$$
$$\times \ (12.2)_8$$

$$5 \ 3 \ 4$$
$$5 \ 3 \ 4$$
$$2 \ 5 \ 6$$
$$\overline{(3 \ 3 \ 6 \ . \ 7 \ 4)_8}$$

$$12 \div 8 = 1 \quad R = 4$$
$$11 \div 8 = 1 \quad R = 3$$
$$14 \div 8 = 1 \quad R = 6$$

1. Convert the following numbers

a. (00110110011.01101)₂ ➔ Hexadecimal and Octal

b. (2EA03.4C)₁₆ ➔ Binary and Octal

c. (5034.25)₁₀ ➔ Binary, Hexadecimal and Octal

2. Perform the following arithmetic operations in the indicated base:

a. $(32.4)_5 + (13.2)_5$

b. $(32.4)_5 - (13.2)_5$

c. $(32.4)_5 * (13.2)_5$

d. $(13.2)_5 - (32.4)_5$

$$32.4$$
$$13.2$$
$$\overline{101.1}$$
$$\to cy = 1$$

$6 \div 5 = 1 \quad R = 1$

$5 \div 5 = 1 \quad R = 0$

$2 + 5$
$$32.4$$
$$-13.2$$
$$\overline{(14.2)_5}$$

$8 \div 5 = 1 \quad R = 3$

$5 \div 5 = 1 \quad R = 0$

$7 \div 5 = 1 \quad R = 2$

$12 \div 5 = 2 \quad R = 2$

$10 \div 5 = 2 \quad R = 0$

$9 \div 5 = 1 \quad R = 4$

$(14.2)_5$

$-(32.4)_5 - (13.2)_5$

$$32.4$$
$$*13.2$$
$$\overline{1203}$$
$$2032$$
$$324$$
$$\overline{(1044.23)_5}$$

$-(14.2)_5$

$5 - 8$
$-\$3$

e. $(128C4.2)_{16} + (58D.C4)_{16}$

f. $(128C4.2)_{16} - (58D.C4)_{16}$

g. $(101101.011)_2 - (100011.101)_2$

1 1
128C4.2 0
+ 0058 D.c4
─────────────
$(12E51.E4)_{16}$

17 ÷ 16 = 1 R = 1
21 ÷ 16 = 1 R = 5

B +16 +16
3
128C4.2 0 +16
0058D.c4
─────────────
$(12336.5C)_{16}$

$(0010001.110)_2$

0# +2
0 9 2
100011.101
─────────────
001101.110

h. $(101101.011)_2 + (100011.101)_2$

$$1\,0\,1\,1\,0\,1\,.\,0\,1\,1$$
$$1\,0\,0\,0\,1\,1\,.\,1\,0\,1$$
$$(1\,0\,1\,0\,0\,0\,1\,.\,0\,0\,0)_2$$

i. Repeat g. and h. by first converting the numbers to hexadecimal and then performing the operation, before converting back to binary.

$(101101.011)_2 - (100011.101)_2$

2 D . 6   2 3 . A

$(101101.011)_2 + (100011.101)_2$

$(2\,D\,.\,6)_{16}$
$- (2\,3\,.\,A)_{16}$
$0\,9\,.\,C\,2$

$1\,0\,0\,0\,\,1\,0\,0\,1\,.\,1\,1\,0\,0$

$17 \div 16 = 1$ r=1

2 D . 6
$+\ 2\,3\,.\,A$
$5\,1\,.\,0$

$0\,1\,0\,1\ \ 0\,0\,0\,1\,.\,0\,0\,0\,0$