

Assignment #1 - Part 2

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12:07 PM

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1.

$$a) 86 \div 2 = 43 \text{ R } 0$$

$$43 \div 2 = 21 \text{ R } 1$$

$$21 \div 2 = 10 \text{ R } 0$$

$$10 \div 2 = 5 \text{ R } 0$$

$$5 \div 2 = 2 \text{ R } 1$$

$$2 \div 2 = 1 \text{ R } 0$$

$$1 \div 2 = 0 \text{ R } 1$$

$$86_{10} = 1011010_2$$

$$b) 763 \div 2 = 381 \text{ R } 1$$

$$381 \div 2 = 190 \text{ R } 1$$

$$190 \div 2 = 90 \text{ R } 0$$

$$90 \div 2 = 40 \text{ R } 0$$

$$40 \div 2 = 20 \text{ R } 0$$

$$20 \div 2 = 10 \text{ R } 0$$

$$10 \div 2 = 5 \text{ R } 0$$

$$5 \div 2 = 2 \text{ R } 1$$

$$2 \div 2 = 1 \text{ R } 0$$

$$1 \div 2 = 0 \text{ R } 1$$

$$763_{10} = 1010000011$$

$$c) 3667 \div 2 = 1833 \text{ R } 1$$

$$1833 \div 2 = 916 \text{ R } 1$$

$$916 \div 2 = 458 \text{ R } 0$$

$$458 \div 2 = 229 \text{ R } 0$$

$$229 \div 2 = 114 \text{ R } 1$$

$$114 \div 2 = 57 \text{ R } 0$$

$$57 \div 2 = 28 \text{ R } 1$$

$$28 \div 2 = 14 \text{ R } 0$$

$$14 \div 2 = 7 \text{ R } 0$$

$$7 \div 2 = 3 \text{ R } 1$$

$$3 \div 2 = 1 \text{ R } 1$$

$$1 \div 2 = 0 \text{ R } 1$$

$$d) 27538_{10} = 0110101110010010_2$$

$$e) 82917373_{10} = 1001111000100110111111101_2$$

$$3667_{10} = 1110010100011_2$$

2.

$$\text{a) } 86 \div 8 = 10 \text{ R } 6$$

$$10 \div 8 = 1 \text{ R } 2$$

$$1 \div 8 = 0 \text{ R } 1$$

$$\text{b) } 763 \div 8 = 95 \text{ R } 3$$

$$95 \div 8 = 11 \text{ R } 7$$

$$11 \div 8 = 1 \text{ R } 3$$

$$1 \div 8 = 0 \text{ R } 1$$

$$\text{c) } 3667_{10} = 7123_8$$

$$\text{d) } 27538_{10} = 65622_8$$

$$\text{e) } 82917373_{10} = 474233775_8$$

3.

$$\text{a) } 86 \div 16 = 5 \text{ R } 6$$

$$5 \div 16 = 0 \text{ R } 5 \quad 86_{10} = 56_8$$

$$\text{b) } 763 \div 16 = 47 \text{ R } 11$$

$$47 \div 16 = 2 \text{ R } 15$$

$$2 \div 16 = 0 \text{ R } 2 \quad 763_{10} = 2FB_{16}$$

$$\text{c) } 3667_{10} = E53_{16}$$

$$\text{d) } 27538_{10} = 6B92_{16}$$

$$\text{e) } 82917373_{10} = 4F137FD_{16}$$

4.

$$\text{a) } 86 \div 5 = 17 \text{ R } 1$$

$$17 \div 5 = 3 \text{ R } 2$$

$$3 \div 5 = 0 \text{ R } 3 \quad 86_{10} = 321_5$$

$$\text{b) } 763 \div 5 = 152 \text{ R } 3$$

$$152 \div 5 = 30 \text{ R } 2$$

$$30 \div 5 = 6 \text{ R } 0$$

$$6 \div 5 = 1 \text{ R } 1 \quad 763_{10} = 11023_5$$

5.

$$\text{a) } 10111_2 = 23_{10}$$

$$\sum^4_{} 2^2 2^1 2^0$$

$$16 + 4 + 2 + 1 = 23$$

$$\text{b) } 11101_2 = 58_{10}$$

$$\sum^5_{} 2^4 2^3 2^2 2^1$$

$$32 + 16 + 8 + 2 = 58$$

$$\text{c) } 1010110_2 = 86_{10}$$

$$\text{d) } 1010110111_2 = 1391_{10}$$

$$6 \div 5 = 1 \quad R \quad 1 \quad 763_{10} = 11023_5$$

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

$$c) 3667_{10} = 104132_5$$

$$d) 27538_{10} = 1340123_5$$

$$e) 82917373_{10} = 132211323443_5$$

$$d) 10101101111_2 = 1391_{10}$$

$$e) 10111001111011110_2 = 760798_{10}$$

6.

$$a) 3 \ 2 \ 3 \ 2_4 = 238_{10}$$

$$4^3 \ 4^2 \ 4^1 \ 4^0$$

$$192 + 32 + 12 + 2 = 238$$

$$b) 2 \ 7 \ 5 \ 4_8 = 1516_{10}$$

$$8^3 \ 8^2 \ 8^1 \ 8^0$$

$$1024 + 448 + 40 + 4 = 1516$$

$$c) 100_{16} = 256_{10}$$

$$d) 100_7 = 49_{10}$$

$$e) 7654_8 = 4012_{10}$$

7.

$$a) E2_{16} = 226_{10}$$

$$b) 1111001111_2 = 1100010_{10}$$

$$c) BAD_{14} = 5F9_{20}$$

$$d) 5345_6 = 4C1_{16}$$

8.

- a) The value of 'A' in ASCII is 65.
- b) Because it is easier to convert between higher and lower case by changing the leading 1 in binary
- c) 110 represents 'W' in ASCII
- d) Because 'a' in ASCII is 97, 'w' is the 23rd letter
- e) 55 represents '7'
- f) Because '0' in ASCII is 48, '7' is the 8th digit.
- g) 43 represents '+'
- h) From 32 to 47 in ASCII are symbol set
- i) UTF8 is another coding scheme and compatible with ASCII
- j) It contains more characters due to its variable length
- k) It spends more resource than ASCII
- l) Because binary digits are limited but decimal numbers are infinite, when represents extremely small decimals, it will use approximate number.