CUE

HW#2

1) a. 0xCAFE

C A F E

1100 1010 1111 1110 <0

1100 1010 1111 1101

0011 0101 0000 0010

$\therefore 0xCAFE = -(3\times16^3 + 5\times16^2 + 0\times16 + 2)_{ten}$

$= -13570_{ten}$

b. 0x4DAD

4 D A D

0100 1101 1010 1101 >0

$\therefore 0x4DAD = 4\times16^3 + 13\times16^2 + 10\times16 + 13_{ten}$

$= 19885_{ten}$

c. 0xFACE

F A C E

1111 1010 1100 1110 <0

1111 1010 1100 1101

0000 0101 0011 0010

$\therefore 0xFACE = -(0\times16^3 + 5\times16^2 + 3\times16 + 2)_{ten}$

$= -1330_{ten}$

2) a. -1314_{ten}

1314	
290	1x1024
290	0x512
34	1x256
34	0x128
34	0x64
2	1x32
2	0x16
2	0x8

2	0x4
0	0x2
0	0x1
13	

$\therefore 1314_{ten} = 10,100,010,0_{two}$

$= 0x00000522$

$\therefore 1314_{ten} = 0|0|,00|0,0|0_{two}$

$\therefore -1314_{ten} = 1|0|0,|1|0|,|1|1|0_{two}$

A D E

$\therefore -1314_{ten} = 0xFFFFFADE$

Summary

CUE

b. 2020

2020	
1016	1×1024
504	1×512
248	1×256
120	1×128
56	1×64
24	1×32
8	1×16
8	1×8
0	0×4
0	0×2
0	0×1

$\therefore 2020_{ten} = 0111,1111,1000$ (7 F 8)

~~$= 0x0000078$~~

$= 0x000007F8$

3) a. $-0.1875_{ten} = (-1) \times 3 \times 2^{-4}$

$= (-1)^1 \times 0011 \times 2^{-(0100)}$ two

$= (-1)^1 \times 0011 \times 2^{-4}$

$= -1 \times 0011_{two} \times 2^{-4}$

$= -1 \times 1.1_{two} \times 2^{-3}$

~~$= -1 \times 1.1_{two} \times 2^{-(0011)}$~~

Fraction = $1000000\ldots0$ two

Exponent = $-3 + 127_{ten}$

$= 124_{ten}$

$= 0111,1100_{two}$

124	
60	1×64
28	1×32
12	1×16
4	1×8
0	1×4
0	0×2
0	0×1

Summary

$\therefore 1011,1100,\underbrace{000\ldots0}_{22}{}_{two}$

B E 4 00000

$\therefore$ 0xBE400000 IEEE hex-single

CUE

b. $0.46875 = (-1)^0 \times 15 \times 2^{-5}$

$= (-1)^0 \times 1111_{two} \times 2^{-5}$

$= (-1)^0 \times 1.111_{two} \times 2^{-2}$

Fraction = $111\underbrace{000\ldots0}_{20}$

Exponent = $-2 + (127)_{ten}$

$= 125_{ten}$

$= 0111,110_{two}$

125	
61	1×64
29	1×32
13	1×16
5	1×8
1	1×4
1	0×2
0	1×1

$\therefore 0\ 0111,110,1\ \underbrace{111,000\ldots0}_{20}{}_{two}$

3 E F 00000

$\therefore$ 3EF00000 IEEE ~~hex-single~~

4) a. 3F400000

3 F 4 00000

0011 1111 0100 000…0 (20)

~~$\therefore 3F400000 = (-1)^0$~~

$01111110_{two} = 0\times2^7 + 1\times2^6 + 1\times2^5 + 1\times2^4 + 1\times2^3 + 1\times2^2 + 1\times2 + 0\times1$

$= 126$

$= -1 + 127_{ten}$

$\therefore 3F400000 = (-1)^0 \times 1.100\ldots0_{two} \times 2^{-1}$

$= 11 \times 2^{-2}$

$= 3 \times 2^{-2}$

$= 0.75_{ten}$

Summary

CUE

b. BE000000

B	E	000000
~~1011~~		
1011	1110	000...0 (24)

$01111100_{two} = 0\times2^7+1\times2^6+1\times2^5+1\times2^4+1\times2^3+1\times2^2+0\times2+0\times1$

$= 124$

$= -3+127$

$\therefore BE000000 = -1\times1.00\ldots0_{two}\times2^{-3}$

$= -1\times1\times2^{-3}$

$= -0.125_{ten}$

5) Comets ☐ are ☐ awesome!'o'

~~43 6F~~

C	o	m	e	t	s	☐	a	r	e	☐	a	w	e
43	6F	6D	65	74	73	20	61	72	65	20	61	77	65

s	o	m	e	!	Null
73	6F	6D	65	21	00

~~∴ 436F 6D65 7473 2061 7265 2061~~
~~7765 736F 6D65 2100~~

∴ 436F 6D65
7473 2061
7265 2061
7765 736F
6D65 2100

Summary