2015313254 [illegible] Assignment 2

2.61

```
#include <stdio.h>
int main() {
    int xA = 0xffffffff;      # xA, xB, xC, xD
    int xB = 0x0;             # 모두 특정한 비트
    int xC = 0xababcdff;      # 지정해서
    int xD = 0x00abcdef;      # 테스트 가능.
    printf("A. = %d\n", !~xA );
    printf("B. = %d\n", !xB );
    printf("C. = %d\n", !~(xC|~0xff));
    printf("D. = %d\n", !((xD>>(3<<3))&0xff));
}
```

2.76

```
#include <stdio.h>
int main() {
    int x=3;     # x값은 변경가능
    printf("%d %d\n", x*5, (x<<2)+x);
    printf("%d %d\n", x*9, (x<<3)+x);
    printf("%d %d\n", x*30, (x<<5)-(x<<1));
    printf("%d %d\n", x*(-56), (x<<3)-(x<<6));
}
```

2.80

```
#include <stdio.h>
int main() {
    int n=4, M=3;    # n과 M은 변경가능.
    int A = (-1<<n);
    int B = (~(-1<<n))<<m;
    printf("A. = %x\n", A);
    printf("B. = %x\n", B);
}
```

2.81

Ⓐ. y가 INT_MIN 즉 -2^{32-1} 일 때

$-y$는 2^{32-1}이 되어 INT의 범위를 넘어

-2^{32-1}이 된다. 그래서 문제가 false가 될수있다.

$(x=0,\ y=-2^{32-1})$

Ⓑ. $(x<<5)+(y<<5)+y-x$

$= 31x+33y$.

Ⓒ. $\sim x+1+\sim y+1-1$

$= -x-y-1 = \sim(x+y)-1$

$= \sim(x+y)+1-1 = \sim(x+y)$

Ⓓ. $x=2^{31}-1 \rightarrow ux=2^{31}-1$ $\quad$ (int)(ux-uy) = -1

$y=-2^{31} \quad\quad uy=2^{31}$

$y-x=-2^{32}+1 \neq -1$

Ⓔ. $((x>>1)<<1) = x-0$ or $x-1$

$\leq x$

2.83

```
return (!sx && !sy && ux<=uy) ||
       (sx && !sy) ||
       (sx && sy && ux>=uy) ||
       (ux<<1 == 0 && uy<<1 == 0);
```

(∵ 조건1 $x>0$, $y\geq 0$, $x\leq y$ / $x\geq 0$, $y>0$, $x\leq y$)

조건2 $x<0$, $y\geq 0$ / $x\leq 0$, $y>0$)

조건3 $x<0$, $y\leq 0$, $x\geq y$ / $x\leq 0$, $y<0$, $x\geq y$)

조건4 $x=0$, $y=0$

2.84

$V = (-1)^s \times M \times 2^E$

$(E = Exp - bias)$ $(bias = 2^{k-1} - 1)$

A. $5.0 = 0b101.0\ldots$

$V=1$ $M = 0b1.01$ $f = 0b0.01$ $E = 2$

$\underline{0}\ \underline{10\cdots01}\ \underline{01000\cdots}$

B. $M = 0b1.1\cdots$

$f = 0b.\underbrace{111\cdots1}_{n}$

$E = n$

$V = 0b\underbrace{11\cdots1}_{n+1} = 2^{n+1} - 1$

$\underline{0}\ \underline{bias+n}\ \underline{111\cdots}$

C. $M = 0b1.0\cdots$

$f = 0b0.0\cdots$

$E = 1 - bias$

$V = 2^{1-bias} \rightarrow$ 別人 2^{bias-1}

$M = 0b1.0\cdots$

$f = 0b0.0\cdots$

$E = bias - 1$ $Exp = bias + E = 2^k - 3$

$\underline{0}\ \underline{11\cdots101}\ \underline{0\cdots}$

2.85

$bias = 2^{k-1} - 1 = 2^7 - 1$

Value	decimal
$\underline{0}\ \underbrace{0\cdots0}_{15}\ \underbrace{0\cdots01}_{62+1}$	$2^{1-bias-63}$
$\underline{0}\ \underbrace{0\cdots01}_{14+1}\ \underbrace{0\cdots0}_{63}$	2^{1-bias}
$\underline{0}\ \underbrace{1\cdots10}_{14+1}\ \underbrace{1\cdots1}_{63}$	$2^{bias}(2-2^{-63})$

2.87

A Bit	A Value	B Bit	B Value
1 01110 001	$-\frac{9}{16}$	1 0110 0010	$-\frac{9}{16}$
0 10110 101	$2^9 \cdot 13 = 208$	0 1110 1010	$2^8 \cdot 13$
1 00111 110	$-1 \cdot 2^{-10}$	1 0000 0111	$-7 \cdot 2^{-10}$
0 00000 101	$5 \cdot 2^{-17}$	0 0000 0001	$1 \cdot 2^{-10}$
1 11011 000	-2^{12}	1 1110 1111	$-31 \cdot 2^3$
0 11000 100	$3 \cdot 2^8$	0 1111 0000	$+\infty$

2.88

A. False $x = INT\_MAX$

B. False $x = 1$ $y = INT\_MAX$

C. True

D. False $dx = 1e^{150}$ $dy = 1e^{160}$ $dz = 1e^{-100}$

E. False $dx != 0$ $dy = 0$