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Homework 2

2.83)

int float\_le(float x, float y){  
        unsigned ux = f2u(x);  
        unsigned uy = f2u(y);  
  
        unsigned signx = ux >> 31;  
        unsigned signy = uy >> 31;  
  
        return (ux << 1 == 0 && uy << 1 == 0) ||  (signx && !signy) ||  (!signx && !signy && ux <= uy) || (signx && signy && ux >= uy);  
}

2.88)

A. No. If x = Tmax

B. No, let y = Tmin

C. No, let dz = Tmax

D. No, let dz = TMax

E. No, if x = 0 and y =1

2.89)

float fpwr2(int x){  
 //result exponent and fraction  
        unsigned exp, frac;  
        unsigned u;  
  
        if (x < -149){  
                //too small. return 0.0  
                exp = 0;  
                frac = 0;  
        } else if (x < -126) {  
                //denormalized result  
                exp = 0;  
                frac = 1 << (x + 149);  
        } else if (x < 128) {  
                //normalized result  
                exp = x + 127;  
                frac = 0;  
        } else {  
                //too big. return pos infinity  
                exp = 255;  
                frac = 0;  
        }  
 //pack exp and frac into 32 bits  
        u = exp << 23 | frac;

//return as float  
        return u2f(u);  
}

3.56)

A.  
    x: %esi  
    n: %ebx  
    result: %edi  
    mask: %edx  
B.  
    result: -1  
    mask: 1  
C.  
    mask != 0  
D.  
    Instruction 10  
E.  
    Instruction 8  
F.  
    int loop(int x, int n)  
    {  
        int result = -1;  
        int mask;  
        for (mask = 1; mask != 0; mask = mask << n ) {  
            result ^= mask & x;  
        }  
        return result;  
    }