

Name: Jessica NoelDate: September 24, 2020Pledge: "I pledge my honor that I have abided by the Stevens Honor System."

For each function below, trace through it with reasonably small integer values. What does each function do?

Requirement: You should assume integers are only **8 bits** for the purpose of this exercise. The sign bit is the leftmost of the 8 bits.

```
int mystery1(int a, int b) {
    int c = a - b,
        d = (c >> 7) & 1,
        mystery = a - c * d;
    return mystery;
}
```

Trace: `mystery1(3, 7)` returns 7Trace: `mystery1(8, 7)` returns 8Summary: Mystery returns the greater integer between a or b

```
int mystery2(int x) {
    return (x && !(x & (x - 1)));
}
```

Trace: `mystery2(1)` returns 1Trace: `mystery2(2)` returns 1Trace: `mystery2(3)` returns 0Trace: `mystery2(4)` returns 1Trace: `mystery2(5)` returns 0Trace: `mystery2(6)` returns 0Trace: `mystery2(7)` returns 0Trace: `mystery2(8)` returns 1Summary: mystery2 returns 1 if x is a power of 2

```
int mystery3(int x, int y) {
    int s, c;
    s = x ^ y;
    c = x & y;
    while (c != 0) {
        c = c << 1;
        x = s;
        y = c;
        s = x ^ y;
        c = x & y;
    }
    return s;
}
```

Trace: `mystery3(5, 7)` returns 12Trace: `mystery3(2, 8)` returns 10Summary: mystery3 will return the sum of the inputs x and y