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Pledge: 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 (give the trace results as numbers in base 10). What does each function do (give a high-level summary)?

**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 **7**

Trace: mystery1(8, 7) returns **8**

Summary: ***mystery1(a,b) returns max(a,b).***

**int mystery2**(**int** x) {

**return** (x && !(x & (x - 1)));

}

Trace: mystery2(1) returns **1**

Trace: mystery2(2) returns **1**

Trace: mystery2(3) returns **0**

Trace: mystery2(4) returns **1**

Trace: mystery2(5) returns **0**

Trace: mystery2(6) returns **0**

Trace: mystery2(7) returns 0

Trace: mystery2(8) returns 1

Summary: ***mystery2(x) returns 1 iff x is an integer power of 2; otherwise returns 0.***

**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 **12**

Trace: mystery3(2, 8) returns **10**

Summary: ***mystery3(x,y) returns x + y.***