1. What Does this Program Do – 2D Arrays

What is printed when this program is run?

```
for I = 1 to 3
        for J = 1 to 3
                A(I,J) = I + J
                B(I,J) = I * J
                C(I,J) = A(I,J) + B(J,I)
        next J
next I
print C(1,1)+C(2,2)+C(3,3)
end
```

answer: 26

The program produces the following arrays:

4	5	6		3	6	9		7	11	15
3	4	5		2	4	6		5	8	5
2	3	4		1	2	3		3	3	4
	[A]				[B]				[C]	

$$\therefore \ 3 + 8 + 15$$
$$= 26$$

2. What Does this Program Do – 2D Arrays

What is the output of this program after execution?

```
for i = 1 to 4
        for j = 1 to 4
                a(i,j) = i + j
        next j
next i
for i = 1 to 4
        for j = 1 to 4
                if a(i,j)/4 = int(a(i,j)/4) then a(i,j) = 0 else a(i,j) = a(i,j)+ 1
                if a(i,j)/3 = int(a(i,j)/3) then a(i,j) = 0 else a(i,j) = a(i,j) − 1
        next j
next i
c = 0
for i = 1 to 4
        for j = 1 to 4
                if a(i,j) = i + j then c = c + 1
        next j
next i
print c
end
```

answer: 7

The first double loop sets up the initial array.

2	3	4	5
3	4	5	6
4	5	6	7
5	6	7	8

The next double loop searches for multiples of 4 and 3. Sets that entry to 0 and adds or subtracts 1 from the rest.

0	3	-1	0
3	-1	0	6
-1	0	6	7
0	6	7	0

The last double loop counts the entries that are unchanged from the initial values

3. Given array A below, what is the final value of C after the program is run?
   Note: A(1,1) = 21.

```
C = O
FOR I = 1 TO 4
      FOR J = 1 TO 4
            IF A(I,J)/4 = INT(A(I,J)/4) THEN A(I,J)=A(I,J)/4
            IF A(I,J)/3 = INT(A(I,J)/3) THEN A(I,J)=A(I,J)/3
            IF A(I,J)/10 = INT(A(I,J)/10) THEN A(I,J)=A(I,J)/10
            IF A(I,J)/2 = INT(A(I,J)/2) THEN A(I,J)=A(I,J)/2
      NEXT J
NEXT I
FOR I = 4 TO 1 STEP -1
      FOR J = 1 TO 4
            IF A(I,J) = 1 THEN C = C + 1
      NEXT J
NEXT I
PRINT C
END
```

21	8	4	90
48	44	1	27
70	5	36	10
16	40	81	24

answer: 6

This program changes entries in the table that are divisible by
4, 3, 10 and 2. Then it counts the entries with a value of 1.
The final table is:

7	1	1	3
2	11	1	9
7	5	3	1
2	1	27	1