HW2 (Group Homework)

1. Match a short Java Program (5 points)

One block of the program is missing. Your challenge is to match the candidate block of code, with the output that you'd see if the block were inserted. Not all the lines of output will be used, and some of the lines of output might be used more than once. Connect the candidate blocks of code with their matching command-line output.

```
class Test {
    public static void main (String[] args) {
        int x = 0;
        int y = 0;
        while (x < 5) {
            Candidate code goes here

            System.out.print (x + "" + y + " ");
            x = x + 1;
            }
    }
}
```

Candidates (fill the letter A - H):

( ) 1. `y = x – y;`

( ) 2. `y = y + x;`

( ) 3.
```
y = y + 2;
if (y > 4) {
    y = y – 1;
}
```

( ) 4.
```
x = x + 1;
y = y + x;
```

( ) 5.
```
if (y < 5) {
    x = x + 1;
    if (y < 3) {
        x = x – 1;
    }
}
y = y + 2;
```

Possible output:

A. 22 46
B. 11 34 59
C. 02 14 26 38
D. 02 14 36 48
E. 00 11 21 32 42
F. 11 21 32 42 53
G. 00 11 23 36 410
H. 02 14 25 36 47

2. Occurrence of Max Value (10 pts)

Problem Description:

Write a program that reads integers, finds the largest of them, and counts its occurrences. Assume that the input ends with number 0. Suppose that you entered 3 5 2 5 5 5 0; the program finds that the largest is 5 and the occurrence count for 5 is 4. (Hint: Maintain two variables, max and count. max stores the current max number, and count stores its occurrences. Initially, assign the first number to max and 1 to count. Compare each subsequent number with max. If the number is greater than max, assign it to max and reset count to 1. If the number is equal to max, increment count by 1.)

Here are sample runs of the program:

Sample 1:

```
Enter numbers: 3 5 2 5 5 5 0
The largest number is 5
The occurrence count of the largest number is 4
```

Sample 2:

```
Enter numbers: 3 6 5 4 2 4 5 4 5 5 0
The largest number is 6
The occurrence count of the largest number is 1
```

Coding: (Copy and Paste Source Code here.)

Testing: (Paste the screenshot of your result here. And describe how you test this program)

3. Locker Puzzle (10 pts)

Problem Description:

A school has 100 lockers and 100 students. All lockers are closed on the first day of school. As the students enter, the first student, denoted S1, opens every locker. Then the second student, S2, begins with the second locker, denoted L2, and closes every other locker. Student S3 begins with the third locker and changes every third locker (closes it if it was open, and opens it if it was closed). Student S4 begins with locker L4 and changes every fourth locker. Student S5 starts with L5 and changes every fifth locker, and so on, until student S100 changes L100.

After all the students have passed through the building and changed the lockers, which lockers are open? Write a program to find your answer. The program should display the answer like this:

Locker x is open
Locker y is open
…
Locker z is open

(Hint: Use an array of 100 boolean elements, each of which indicates whether a locker is open (true) or closed (false). Initially, all lockers are closed.)

Coding: (Copy and Paste Source Code here.)

Testing: (Paste the screenshot of your result here. And describe how you test this program)