Midterm 1 extra preparation problems - solutions

```
1.
4 8 12
4
8
```

2.

Bug #1: On line 3, the loop condition should be either:

i < array.length

or

i <= array.length - 1

Bug #2: Missing curly braces after the if statement on line 4. Add curly braces surrounding lines 5 and 6.

Bug #3: The algorithm will not work if all the values in the array are positive (greater than zero). Because we set min = 0 on line 1, the if statement on line 4 can only ever be true for a number in the array less than zero. Which means the algorithm doesn't find the correct minimum if all the values are positive.

The root of the problem is that we need to initialize min on line 1 to a number that is greater than or equal to than at least one number in the array. If we happen to initialize min to something smaller than all the numbers in the array (like might have happened here with min = 0), the algorithm won't find the correct minimum because the initial value for min might be *too* small.

To fix this, we have to initialize min on line 0 to either a very big number, and hope that all the values in the array aren't bigger than that number, or, a better way is to initialize it to array[0]. That way, we are guaranteed that whenever the loop encounters the true minimum in the array, it will be less than min, and therefore the if statement will run.

Bonus Bug #4: This code declares and initializes minIndex, and this is what is printed out in the final line...However, inside the for loop, the undeclared variable minLocation is used to store the variable! The variable used there should be minIndex, so that the print statement appropriately prints the index of the minimum number.