Concordia University
COMP 248 – Fall 2020

Assignment 3

Due Date:	By 11:55 PM, November 6th, 2020
Evaluation:	3% of final mark (see marking rubric at the end of handout)
Late Submission:	none accepted
Purpose:	The purpose of this assignment is to help you learn Java arrays.
CEAB/CIPS ATTRIBUTES:	Design/Problem analysis/Communication Skills

General Guidelines When Writing Programs:

Refer to assignment #1 handout.

Question 1: (locker puzzle game)

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
```

Question 2: (Duplicate Elimination)

Use a one-dimensional array to solve the following problem: Write an application that inputs ten numbers, each between 10 and 100, both inclusive. Save each number that was read in an array that was initialized to a value of -1 for all elements. Assume a value of -1 indicates an array element is empty. You are then to process the array, and remove duplicate elements from the array containing the numbers you input. Display the contents of the array to demonstrate that the duplicate input values were actually removed.
Sample Output could be as follows:

Sample 1:

```
Please input a value in [10,100]
value 1: 78
value 2: 34
value 3: 46
value 4: 74
value 5: 87
value 6: 39
value 7: 39
value 8: 46
value 9: 78
value 10: 78
The unique values are:
78  34  46  74  87  39
```

Sample 2:

```
Please input a value in [10,100]
value 1: 20
value 2: 25
value 3: 34
value 4: 7
Wrong value, please input a value in [10,100]: 77
value 5: 45
value 6: 34
value 7: 120
Wrong value, please input a value in [10,100]: 22
value 8: 34
value 9: 25
value 10: 20
The unique values are:
20  25  34  77  45  22
```

Submitting Assignment 3

What to submit:

Zip the 2 source codes (the .java files only please, **not** the entire project) of this assignment as a .ZIP file (**NOT** .RAR) using the following naming convention:
a#_studentID, where # is the number of the assignment and *studentID* is your student ID number.

For example, for this second assignment, student 123456 would submit a zip file named a3_123456.zip

Evaluation Criteria for Assignment 3	
Source Code	
Comments for all 2 questions (3 pts.)	
Description of the program (authors, date, purpose)	1 pt.
Description of variable and constants	1 pt.
Description of the algorithm	1 pt.
Programming styles for all 2 questions (3 pts.)	
Use of significant names for identifiers	1 pt.
Indentation and readability	1 pt.
Welcome Banner/Closing message	1 pt.
Question 1 (7 pts.)	
The usage of array	2 pts.
The algorithm used to identify the open lockers	3 pts.
The correctness of displaying the open lockers.	2 pts.
Question 2 (7 pts.)	
Declaration and initialization of the array	1 pts.
Only input user values within specified range	1 pts.
Implementation of the algorithm to find duplicates.	3 pts.
Correctly print the result	2 pt.
TOTAL	**20 pts.**