Lab 4

Exercise 1: Write a Java program that prompts the user to enter an integer and displays a pyramid, as shown in the following sample runs:

```
Please input pyramid's height: 3
1
22
333

Please input pyramid's height: 8
1
22
333
4444
55555
666666
7777777
88888888
```

Exercise 2: Write a Java program that asks users to input a few positive integers and reports the duplication of adjacent inputs. Use 0 to signify the end of the input. Below are two sample runs:

```
Enter a positive integer (0 to end the input): 1
Enter a positive integer (0 to end the input): 2
Enter a positive integer (0 to end the input): 2
Input value 2 is an adjacent duplicate input
Enter a positive integer (0 to end the input): 0

Enter a positive integer (0 to end the input): 1
Enter a positive integer (0 to end the input): 1
Input value 1 is an adjacent duplicate input
Enter a positive integer (0 to end the input): 1
Input value 1 is an adjacent duplicate input
Enter a positive integer (0 to end the input): 2
Enter a positive integer (0 to end the input): 3
```

```
Enter a positive integer (0 to end the input): 4
Enter a positive integer (0 to end the input): 4
Input value 4 is an adjacent duplicate input
Enter a positive integer (0 to end the input): 3
Enter a positive integer (0 to end the input): 2
Enter a positive integer (0 to end the input): 5
Enter a positive integer (0 to end the input): 5
Input value 5 is an adjacent duplicate input
Enter a positive integer (0 to end the input): 0
```

Exercise 3: Write a program that takes a string of two characters as input from the user. The two characters represent (1) the discipline of study and (2) year in which the student is in. In this program, the following five code names represent the corresponding disciplines:

M: Medicine
C: Civil engineering
L: Law
E: Electrical Engineering
I: Computer Science & Information Engineering

Additionally, the number of printed asterisk symbols (*) represents the year of study. The following are sample runs of the program.

```
Please input a 2 character student code: C1
The student majors in Civil Engineering,
and is in year: *.

Please input a 2 character student code: I3
The student majors in Computer Science & Information Engineering,
and is in year: ***.

Please input a 2 character student code: K4
The student majors in Unknown,
and is in year: ****.
```

Exercise 4: Write a Java program that reads positive integers, find the largest of them, count its occurrences and print out the average of all input integers up to two decimal places (小數點第二位). Use the characters ‘Q’ or ‘q’ to end the input. Below are two sample runs:

```
Enter an integer, or quit with Q or q: 1
Enter an integer, or quit with Q or q: 2
Enter an integer, or quit with Q or q: 3
Enter an integer, or quit with Q or q: q
The largest number is 3
The count for the largest number is 1
The average is 2.00

Enter an integer, or quit with Q or q: 3
Enter an integer, or quit with Q or q: 5
Enter an integer, or quit with Q or q: 2
Enter an integer, or quit with Q or q: 5
Enter an integer, or quit with Q or q: 5
Enter an integer, or quit with Q or q: 5
Enter an integer, or quit with Q or q: Q
The largest number is 5
The count for the largest number is 4
The average is 4.17
```