Practice 3

Deadline: 2 weeks from now. Should be checked onsite (during labs).

Task 1

In this task, you'll write a program that allows users to filter any integer array based on a certain criterion. Specifically, the users may choose one of the functions:

- Get only even numbers
- Get only odd numbers
- Get only prime numbers
- Get prime numbers that are bigger than 5

Users should input the size of the array as well as all the elements in the array, and the program will output the corresponding filtering results.

Tips: can we treat each criterion as a function and pass it as a parameter? Check the **Predicate<T>** functional interface.

Sample Output

```
Please input the function No:
1 - Get even numbers
2 - Get odd numbers
3 - Get prime numbers
4 - Get prime numbers that are bigger than 5
0 - Quit
4
Input size of the list:
6
Input elements of the list:
2 5 7 11 14 15
Filter results:
[7, 11]
Please input the function No:
1 - Get even numbers
2 - Get odd numbers
3 - Get prime numbers
4 - Get prime numbers that are bigger than 5
0 - Quit
0

Process finished with exit code 0
```

Task 2

A queue is a data structure that is based on first-in first-out (FIFO) in which the first item input is also the first item removed. Items are added to the end of the line and removed from the beginning. In this task, you are required to implement `MyQueue<E>` structure. You should define **constructors** and the **enQueue** and **deQueue** method in the `MyQueue` class.

Sample output:

```
**********Integer queue test**********
**********After enqueue**********
6
7
8
**********After dequeue**********
8
**********After enqueue**********
8
9
10
**********After dequeue**********
9
10
**********After enqueue**********
9
10
11
12

**********String queue test**********
**********After enqueue**********
A
B
**********After dequeue**********
B
**********After enqueue**********
B
D
**********After dequeue**********
**********After enqueue**********
E
F
```

Evaluation

The practice will be checked by teachers or SAs. What will be tested:

1. That you understand every line of your own code, not just copy from somewhere
2. That your program compiles correctly (javac)
3. Correctness of the program logic
4. That the result is obtained in a reasonable time

Late submissions after the deadline will incur a 20% penalty, meaning that you can only get 80% of this practice's score.