CS-200-1: Programming I, Fall 2014
Northeastern Illinois University
Homework #8
Due: Wednesday, November 19th by 2:50 p.m.

Assignment Specifications: Read all instructions carefully!

Make sure the following are in a .zip file - Do **NOT** submit files individually to D2L!!

☐ Your source code (the .java files).

☐ Your output in .txt file(s).

☐ Make sure your name and assignment number are in the .txt file and the .java file(s) (as comments for the .java files).

☐ Turn your homework in to D2L before class (no late homework will be accepted - see syllabus for policies).

Problem #1

• Determine what is printed out to the console. In a .txt file (named Homework8_P1.txt), put the output (i.e. what is printed out to the console) exactly as it would appear in the console.

• Put the Homework8_P1.txt file into a folder named Homework8.

```java
public class HW8Tracing
{
    public static void main(String[] args)
    {
        int size = 4, i = 0;
        int[] nums = {5, 2, 15, 1};

        while (i < size)
        {
            method1(nums, i);
            System.out.println("i is " + i + " and nums[i] is " + nums[i] * 2);
            i++;
        }
        int[] nums2 = method2(nums);
        method3(nums2);
    }

    public static void method1(int[] array, int index)
    {
        array[index] = index * array[index];
    }

    public static int[] method2(int[] array)
    {
        int[] nums = new int[array.length];
        for (int i = 0; i < array.length; i++)
            nums[i] = (array[i] + 1) % array.length;

        return nums;
    }

    public static void method3(int[] array)
    {
        for (int i = 0; i < array.length; i++)
            System.out.print(array[i] + " ");

        System.out.println();
    }
}
```

Problem #2

- Create a new .java file named Swapping.java.

- Write a program that asks the user how many numbers they would like to enter.

- Then prompt the user to enter the numbers.

- Write a method that has the following header:

  ```java
  public static int[] swapEnds(int[] nums)
  ```

- Use your method (i.e. invoke it) in the main method to swap the first and last elements in the array. Return the modified array.

- Print out the new array.

- Your output should match the sample output below.

- Put the Swapping.java file into the Homework8 folder.

```
Total numbers to input? 4
Enter numbers: 1 2 3 4
After the swap: 4 2 3 1
```

```
Total numbers to input? 5
Enter numbers: 8 6 7 9 5
After the swap: 5 6 7 9 8
```

Problem #3

- Create a new .java file named Shifted.java.

- Write a program that asks the user how many numbers they would like to enter.

- Then prompt the user to enter the numbers.

- Write a method that has the following header:

  ```java
  public static int[] shiftLeft(int[] nums)
  ```

- Use your method (i.e. invoke it) in the main method to shift all the elements in the array one position to the left. For example, $\{6, 2, 5, 3\}$ when shifted to the left becomes $\{2, 5, 3, 6\}$ Return the modified array.

- Print out the new array.

- Your output should match the sample output below.

- Put the Shifted.java file into the Homework8 folder.

```
Total numbers to input? 4
Enter numbers: 1 2 3 4
After the shift: 2 3 4 1
```

```
Total numbers to input? 5
Enter numbers: 8 6 7 9 5
After the shift: 6 7 9 5 8
```

Problem #4

- Create a new .java file named FizzBuzz.java.

- This is slightly more difficult version of the famous FizzBuzz problem which is sometimes given as a first problem for job interviews.

- Consider the series of numbers beginning at **start** and running up to but not including **end**. For example start = 1 and end = 5 gives the series 1, 2, 3, 4.

- Write a method that has the following header:

  ```
  public static String[] fizzBuzz(int start, int end)
  ```

- Return a new String[] array containing the string form of these numbers, except in the case of multiples of 3 use the word "Fizz" instead of the number, and for multiples of 5 use the word "Buzz" instead of the number, and for multiples of both 3 and 5 use "FizzBuzz".

- To convert an integer to a String, use `String.valueOf()`. For example, String.valueOf(5) produces the value "5".

- Hint: Your String array size will be the value of **end** - **start**

- Use your method (i.e. invoke it) in the main method on the following test cases:
  ```
  fizzBuzz(1, 6)
  ```
  ⇒ {"1", "2", "Fizz", "4", "Buzz"}
  ```
  fizzBuzz(10, 16)
  ```
  ⇒ {"Buzz", "11", "Fizz", "13", "14", "FizzBuzz"}

- Put the FizzBuzz.java file into the Homework8 folder.