

Northeastern Illinois University
CS200-1, Programming I, Summer 2017
Homework 6
Due date: Thursday 7/6/2017 at 1:00 p.m.

Problem 1:

Create a class named Problem1, the program would do the following:

- The program prompts the user to enter a positive integer n . The program must error check (keep prompting and reading integers until you get a positive integer n).
- The program then will create an array with n elements, and prompt the user to enter n elements and store them in that array.
- The program should print all the elements of the array on the same line separated by spaces.
- The program should find and print the maximum integer entered, the minimum integer entered and the average of all integers entered.
- The program should print all the elements that are greater than the average.
- The program should print all the elements that are greater than the last element of the array.
- The program should print all the array elements on the same line separated by spaces **THIS TIME IN REVERSE ORDER** (last to first).
- Below are two sample runs.
- Copy the output to a text file named Problem1.txt

```
Enter integer n, greater than 0: -5
Enter integer n, greater than 0: -31
Enter integer n, greater than 0: 0
Enter integer n, greater than 0: 5
Enter 5 integers: 4 5 8 9 2
```

```
You entered: 4 5 8 9 2
```

```
Maximum value: 9
Minimum value: 2
Average: 5.6
```

```
Elements greater than average:
8 9
Elements greater than 2:
4 5 8 9
Array in reverse order:
2 9 8 5 4
```

```
Enter integer n, greater than 0: 0
Enter integer n, greater than 0: -3
Enter integer n, greater than 0:: 7
Enter 7 integers: 65 7 89 32 43 23 47
```

```
You entered: 65 7 89 32 43 23 47
```

```
Maximum value: 89
Minimum value: 7
Average: 43.714285714285715
```

```
Elements greater than average:
65 89 47
Elements greater than 47:
65 89
Array in reverse order:
47 23 43 32 89 7 65
```

Problem 2:

- What is the **exact** output for the program below?
- Print and use the tracing worksheet provided on the next page. You are required to trace the program by hand in order to get credit for the question. Show your work as well as the output on the tracing worksheet.
- Scan the tracing worksheet, then save it as **.pdf** file.
- Your output should go in the output box provided on the next page.

```
public class TracingArray
{
    public static void main(String[] args)
    {
        int[] arr = {7, 6, 3, 5, 7, 2, 4};

        System.out.println(arr.length + 2);

        for(int i = 1; i <= 3; i++)
        {
            System.out.print("Loops ");
        }
        System.out.println(" :(");

        for(int i = 1; i < arr.length; i = i + 2)
        {
            arr[i] = arr[i] * i;
        }

        for(int i = 1; i < arr.length; i = i + 2)
        {
            System.out.println(arr[i] + " ");
        }
        System.out.println();

        arr[3] = 7;

        for (int i = 1; i < arr.length; i++)
        {
            if (arr[i-1] % 2 == 0)
            {
                arr[i] = arr[i-1]/2;
            }
            else
            {
                arr[i] = 3 * arr[i - 1] + 1;
            }
        }
        for(int i = 0; i < arr.length; i++)
        {
            System.out.print(arr[i] + " ");
        }
    }
}
```

Tracing Worksheet

Output:

Memory Box:

i=

arr =

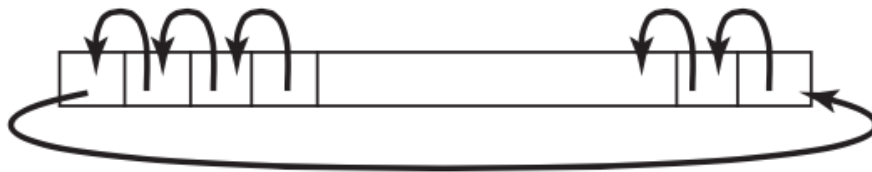
0	1	2	3	4	5	6

Problem 3:

Create a class named Problem3, the program would do the following:

- Create an integer array with 10 elements.
- Initialize your array to have the following elements:

`{2, 3, 9, 17, 32, 40, 73, 40, 21, 10}`
- Print all elements of the array.
- Shift all elements one position left.
- Set the last element to have the original value of the first element.
- Print all elements of the array again.
- Here is an example how it works:



- Below is a sample run.
- Copy the output to a text file named Problem3.txt

```
Before shifting:
2 3 9 17 32 40 73 40 21 10

After shifting:
3 9 17 32 40 73 40 21 10 2
```

Problem 4:

Create a class named Problem4, the program would do the following:

- Prompt the user to enter an integer n , n should be greater than 10 (Error check required).
- Create an integer array with n elements.
- Initialize your array with random numbers between 2 and 75:
- Print all the elements of the array on the same line separated by spaces.
- Print the sum of the elements at indexes 2, 5, 7 and 9.
- Swap the elements at index 2 and 6.
- Swap the elements at index 4 and 7.
- Print all the elements of the array again on the same line separated by spaces.
- Print the sum of the elements at indexes 2, 5, 7 and 9 again.
- Below are two sample runs.
- Copy the output to a text file named Problem4.txt

```
Enter integer n greater than 10: 10
Enter integer n greater than 10: 9
Enter integer n greater than 10: 13

Before swap:
8 69 20 34 47 13 19 28 37 66 54 65 9
Sum of elements at indexes 2, 5, 7 and 9 is: 127

After swap:
8 69 19 34 28 13 20 47 37 66 54 65 9
Sum of elements at indexes 2, 5, 7 and 9 is: 145
```

```
Enter integer n greater than 10: 2
Enter integer n greater than 10: 14

Before swap:
71 11 23 58 51 56 25 36 8 8 51 48 57 65
Sum of elements at indexes 2, 5, 7 and 9 is: 123

After swap:
71 11 25 58 36 56 23 51 8 8 51 48 57 65
Sum of elements at indexes 2, 5, 7 and 9 is: 140
```

General Instructions:

- No hard copies will be collected.
- Do not send your files through the email!
- You should submit your work by the due date, **No** extensions will be given. (See syllabus for late homework policy).
- DO **NOT** turn in multiple files, only one .zip file.

What to turn in:

There should be two .java file, two .txt file and one .pdf file, put all those files into a zip file and name it <YourFirstName_YourLastName>.zip, submit the zip file into the Dropbox on D2L.

How to zip multiple files?

On Windows: Select all the files > right click > Send to > Compressed File

On Mac: Select all the files > Click/Tap with two fingers > Compress Items