

Intro to Java Week 3 Coding Assignment

Points possible: 70

Category	Criteria	% of Grade
Functionality	Does the code work?	25
Organization	Is the code clean and organized? Proper use of white space, syntax, and consistency are utilized. Names and comments are concise and clear.	25
Creativity	Student solved the problems presented in the assignment using creativity and out of the box thinking.	25
Completeness	All requirements of the assignment are complete.	25

Instructions: In Eclipse, or an IDE of your choice, write the code that accomplishes the objectives listed below. Ensure that the code compiles and runs as directed. Take screenshots of the code and of the running program (make sure to get screenshots of all required functionality) and paste them in this document where instructed below. Create a new repository on GitHub for this week's assignments and push this document, with your Java project code, to the repository. Add the URL for this week's repository to this document where instructed and submit this document to your instructor when complete.

Coding Steps:

1. Create an array of int called ages that contains the following values: 3, 9, 23, 64, 2, 8, 28, 93.
 - a. Programmatically subtract the value of the first element in the array from the value in the last element of the array (i.e. do not use ages[7] in your code). Print the result to the console.
 - b. Add a new age to your array and repeat the step above to ensure it is dynamic (works for arrays of different lengths).
 - c. Use a loop to iterate through the array and calculate the average age. Print the result to the console.
2. Create an array of String called names that contains the following values: "Sam", "Tommy", "Tim", "Sally", "Buck", "Bob".
 - a. Use a loop to iterate through the array and calculate the average number of letters per name. Print the result to the console.
 - b. Use a loop to iterate through the array again and concatenate all the names together, separated by spaces, and print the result to the console.

3. How do you access the last element of any array?
4. How do you access the first element of any array?
5. Create a new array of int called nameLengths. Write a loop to iterate over the previously created names array and add the length of each name to the nameLengths array.
6. Write a loop to iterate over the nameLengths array and calculate the sum of all the elements in the array. Print the result to the console.
7. Write a method that takes a String, word, and an int, n, as arguments and returns the word concatenated to itself n number of times. (i.e. if I pass in "Hello" and 3, I would expect the method to return "HelloHelloHello").
8. Write a method that takes two Strings, firstName and lastName, and returns a full name (the full name should be the first and the last name as a String separated by a space).
9. Write a method that takes an array of int and returns true if the sum of all the ints in the array is greater than 100.
10. Write a method that takes an array of double and returns the average of all the elements in the array.
11. Write a method that takes two arrays of double and returns true if the average of the elements in the first array is greater than the average of the elements in the second array.
12. Write a method called willBuyDrink that takes a boolean isHotOutside, and a double moneyInPocket, and returns true if it is hot outside and if moneyInPocket is greater than 10.50.
13. Create a method of your own that solves a problem. In comments, write what the method does and why you created it.

Screenshots of Code:

```
1 package Week3.Week3CodingAssignment;
2
3 import java.util.*;
4 public class Week3CodingAssignment {
5     Run | Debug
6     public static void main(String[] args) {
7         int[] ages = { 3, 9, 23, 64, 2, 8, 28, 93, 102 };
8         System.out.println("Last age minus first: " + (ages[ages.length - 1] - ages[0]));
9         double ageSum = 0.0;
10        for (int age : ages) {
11            ageSum += age;
12        }
13        System.out.printf(format: "The average age is %.2f\n", ageSum/ages.length);
14
15        String[] names = {"Sam", "Tommy", "Tim", "Sally", "Buck", "Bob"};
16        double nameSum = 0.0;
17        for (String name : names) {
18            nameSum += name.length();
19        }
20        System.out.printf(format: "The average length of names in the array is %.2f\n", nameSum/names.length);
21        String namesConcat = names[0];
22        for (int i = 1; i < names.length; i++) {
23            namesConcat += ", " + names[i];
24        }
25        System.out.println(namesConcat);
26
27        //you access the last element of an array by using array[array.length - 1]
28        //you access the first element of an array by using array[0]
29
30        int[] nameLengths = new int[names.length];
31        for (int i = 0; i < nameLengths.length; i++) {
32            nameLengths[i] = names[i].length();
33        }
34        int nameArraySum = 0;
35        for (int length : nameLengths){
36            nameArraySum += length;
37        }
38        System.out.println("The sum of the lengths in the array is " + nameArraySum);
39        System.out.println(repeatWord(word: "Hi", n: 5));
40        System.out.println(fullName(firstName: "Bruce", lastName: "Wayne"));
41        int[] arr3 = {35, 29, 83};
42    }
```

```

41     System.out.println("This array has a sum greater than 100: " + isGreaterThan100(arr3));
42     double[] arr4 = {30.2, 29.5, 67.8};
43     System.out.println("The average of this array is " + averageOfArray(arr4));
44     double[] arr5 = {389.8, 293.2, 394.1};
45     double[] arr6 = {39.5, 29.4, 10.2};
46     System.out.println("The first array has a larger average: " + isArrayAverageLarger(arr5, arr6));
47     System.out.println("Is it both hot out and I have enough money for a drink? " + willBuyDrink(isHotOutside: true, moneyInPocket: 7.24));
48     int[] arr7 = {14, 53, 63, 55, 3, 87};
49     System.out.println("The median of this array is: " + medianOfArray(arr7));
50
51
52 }
53
54 public static String repeatWord(String word, int n) {
55     String output = "";
56     for (int i = 0; i <= n; i++){
57         output += word;
58     }
59     return output;
60 }
61
62
63 public static String fullName(String firstName, String lastName) {
64     return firstName + " " + lastName;
65 }
66
67 public static boolean isGreaterThan100(int[] array){
68     int sum = 0;
69     for (int number : array) {
70         sum += number;
71     }
72     if (sum > 100) {
73         return true;
74     }
75     return false;
76 }
77

```

```

78 public static double averageOfArray(double[] array) {
79     double sum = 0;
80     for (double num : array) {
81         sum += num;
82     }
83     return sum/array.length;
84 }
85
86 public static boolean isArrayAverageLarger(double[] arr1, double[] arr2){
87     double sum1 = 0;
88     double sum2 = 0;
89     for (double num : arr1) {
90         sum1 += num;
91     }
92     for (double num : arr2) {
93         sum2 += num;
94     }
95     if (sum1/arr1.length > sum2/arr2.length){
96         return true;
97     }
98     return false;
99 }
100
101 public static boolean willBuyDrink(boolean isHotOutside, double moneyInPocket) {
102     if (isHotOutside == true && moneyInPocket >= 10.50){
103         return true;
104     }
105     return false;
106 }
107

```

```

108 //this method looks through an array and returns the median
109 //median, like average, can be useful for understanding a dataset
110 //because median is the "centermost value"
111 //I chose to calculate median because it is just a little more complicated
112 //than finding the average or largest or smallest value in an array
113
114 public static int medianOfArray(int[] arr){
115     Arrays.sort(arr); //sort the array using the inbuilt sort method, to use this you need to import java.util
116     if (arr.length % 2 != 0) {
117         return arr[(arr.length)/2];
118     }
119     return ((arr[(arr.length - 1) / 2]) + (arr[(arr.length)/2]))/2;
120 }
121 }
122

```

Screenshots of Running Application:

```

Microsoft Windows [Version 10.0.19044.1826]
(c) Microsoft Corporation. All rights reserved.

C:\Users\emily\Promineo> cmd /C ""C:\Program Files\Java\jdk-11.0.15\bin\java.exe" -agentlib:jdwp=transport=dt_socket,server=n,suspend=y,address=localhost:53
133 -cp C:\Users\emily\AppData\Roaming\Code\User\workspaceStorage\9feb815321f318e6b8751471ac2b50e\redhat.java\jdt_ws\Promineo_e90df0af\bin Week3.Week3CodingAssignment.Week3CodingAssignment "
Last age minus first: 99
The average age is 36.89
The average length of names in the array is 3.83
Sam, Tommy, Tim, Sally, Buck, Bob
The sum of the lengths in the array is 23
HHHHHHHHHH
Bruce Wayne
This array has a sum greater than 100: true
The average of this array is 42.5
The first array has a larger average: true
Is it both hot out and I have enough money for a drink? false
The median of this array is: 54

C:\Users\emily\Promineo>

```

URL to GitHub Repository:

<https://github.com/egwalls/Week3CodingAssignment>

