**Northeastern Illinois University**

**CS-200: Programming I**

**Arrays and Methods**

**Problem 1.**

* Write a program that has the class name Problem1 and that has the main method. Leave the main method empty for now.
* Write a method named maxThree that takes one parameter, an integer array a and returns an integer.
* The method should return the largest value from the first, last and middle values in a. You can assume that the length of a is at least 1 and is odd.
* Several sample usages are provided for you below. Use the sample usages in the main method to test your code.

|  |  |
| --- | --- |
| Sample Method Usage | Return value |
| **int** [] a1 = { 1, 2, 3 };  **int** n1 = maxThree(a1); | 3 |
| **int** [] a2 = { -8, -7, -2, 1, -3 };  **int** n2 = maxThree(a2); | -2 |
| **int** [] a3 = { 9 };  **int** n3 = maxThree(a3); | 9 |

**Problem 2.**

* Write a program that has the class name Problem2 and that has the main method.
* Write a method named multipleOfIndices that takes one parameter, a positive integer array arr and returns a boolean array.
* For every integer in the integer array, the program should check if the integer is a multiple of the index it is in and assign the boolean as an element for boolean array at that index. Note that if the index is 0th and 1st, then return true if the remainder is equal to the index when divided by 10 else return false.
* As a reminder, a number m is a multiple of n if m can be evenly divided into n. For example, 24 can be divided into 3 evenly, therefore 24 is a multiple of 3, so the element would get a value of true if 24 is in a 3rd index.
* Create a printArray method that takes a boolean array as a parameter and prints out the elements of the array on the same line separated by a space.
* Several sample runs are provided for you below. Your output must be formatted **exactly** like the sample runs below. Use the sample usages in the main method to test your code.

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| --- | --- |
| Sample Method Usage | Return value |
| **int**[] a1 = { 1, 21, 5, 9, 12, -50, 47 };  **boolean**[] b1 = multipleOfIndices(a1); | { false, true, false, true, true, true, false } |
| int[] a2 = {5, 3, 77, 34, 43};  boolean[] b2 = multipleOfIndices(a2); | { false, false, false, false, false} |
| int[] a3 = { 30, 22, 42, 8, 15, 27, 6 };  boolean[] b3 = multipleOfIndices(a3); | { true, false, true, false, false, false, true } |
| int[] a4 = { 10, 51, 34, 69, 44, 95};  boolean[] b4 = multipleOfIndices(a4); | { true, true, true, true, true, true } |

**Problem 3.**

* Write a program that has the class name Problem3 and that has the main method. Leave the main method empty for now.
* Write a method named greaterThanSum that takes one parameter, an integer array a and returns a new integer array x.
* The method finds all the terms of an array a that are greater than the sum of all previous terms of the sequence. If there are no such elements, you can return an empty array.
* Several sample usages are provided for you below. Use the sample usages in the main method to test your code. Create a printArray method that takes an integer array as a parameter and prints out the elements of the array on the same line separated by a comma and space.

|  |  |
| --- | --- |
| Sample Method Usage | Return value |
| **int**[] a1 =  { 1, 4, 16, -19, -12, 2, 5 };  int[] x1 = greaterThanSum(a1); | {1, 4, 16, 2, 5 } |
| **int**[] a2 = { -1, -2, -4, -12 };  int[] x2 = greaterThanSum(a2); | { } |
| **int**[] a3 =  { 29, -10, 22, 5, -15, 19, 62};  int[] x3 = greaterThanSum(a3); | {29, 22, 62 } |
| **int**[] a4 = { 5, 8, 17, 50};  int[] x4 = greaterThanSum(a4); | {5, 8, 17, 50 } |