GIFT School of Engineering and Applied Sciences

Spring 2022

CS-240: Object-oriented Programming - Lab

Lab-2 Manual

Methods and Arrays – Review

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Task #1: Arrays and Methods

In this task, you are being asked to write a method that manipulates an array in Java.

Write a method called **`sumEvenOdd`** that accepts one integer array as argument and prints the sum of all even and odd numbers in separate lines.

You may use the following header for this method:

```
static void sumEvenOdd(int[] array)
```

For example, if we pass **`{5, 6, 1, 9, 15, 7, 37, 15, 38}`** to this method, then the method should print:

```
Sum of all even numbers: 44
Sum of all odd numbers: 89
```

NOTE: Declare and initialize the array without taking input from user.

1. Create a program called **ArraySumEvenOddLab2.java**
2. Correctly display appropriate messages.

Task #2: Arrays and Methods

In this task, you are being asked to write a method that manipulates an array in Java.

Write a method called **`printPrimes`** that accepts one integer array as argument and print all the prime numbers form the array.

You may use the following header for this method:

```
static void printPrimes(int[] array)
```

For example, if you pass **`{2, 4, 21, 12, 5, 41, 63, 37, 97, 75}`** to this method, then the method should print **`2, 5, 7, 41, 37, 97`**, as prime numbers.

To help with finding a prime number, the **`printPrimes()`** method would call another method:

```
static boolean isPrime(int number)
```

that takes an integer as an argument, and returns **true** if that number is a prime, otherwise, returns **false.**

NOTE: Declare and initialize the array without taking input from user.

1. Create a program called **ArrayPrintPrimesLab2.java**
2. Correctly display appropriate messages.

Task #3: Arrays and Methods

In this task, you are being asked to write a method that manipulates arrays in Java.

Write a method called **`printCommon`** that accepts two integer arrays as arguments and print all the common elements from the two arrays.

You may use the following header for this method:

```
static void printCommon(int[] firstArray, int[] secondArray)
```

For example, if the elements of two arrays are **`{5, 1, 9, 15, 29, 25, 27, 6, 10}`** and **`{9, 4, 1, 0, 27, 5, 31, 37}`**, then the method should print **`{5, 1, 9, 27}`**.

NOTE:

- Declare and initialize both arrays without taking input from user.
- Both arrays do not need to be of the same size.

1. Create a program called **ArrayPrintCommonLab2.java**
2. Correctly display appropriate messages.

Task #4: Arrays and Methods

In this task, you are being asked to write a method that manipulates arrays in Java.

Write a method called **`printUnique`** that accepts one integer array as argument, and print all unique elements form the array.

You may use the following header for this method:

```
static void printUnique(int[] array)
```

For example, if you pass **`{3, 7, 3, 17, 7, 5, 19, 0, 11, 2}`** to this method, then the method should print **`17, 5, 19, 0, 11, 2`** as unique elements.

NOTE: Declare and initialize the array without taking input from user.

1. Create a program called **ArrayPrintUniqueLab2.java.**
2. Correctly display appropriate messages.

Task #5: Arrays and Methods

In this task, you are being asked to write methods that manipulate arrays in Java.

1. Write a method called **`sortArrayZeroOneTwo`** that accepts one integer array of **0's**, **1's** and **2's** as argument, and sort the array in such a way that all **0's** comes first, all **1's** comes in middle and all **2's** comes at the end of the array.

   The method should only sort the array if all the elements are either **0, 1 or 2**, otherwise it should return the original array as it is.

   You may use the following header for this method:

   ```
   static void sortArrayZeroOneTwo(int[] array)
   ```

   For example, if we pass **`{1, 2, 1, 0, 0, 2, 1, 0, 1, 2, 2, 1, 1, 1, 0, 2, 1}`** then the method should sort it as: **`{0, 0, 0, 0, 1, 1, 1, 1, 1, 1, 1, 1, 2, 2, 2, 2, 2}`**.

2. Write another method called **`isValidArray`** that accepts one integer array as argument, and return **true** if the all elements of the array are either **0 , 1 or 2**, or **false** otherwise.

   You may use the following header for this method:

   ```
   static boolean isValidArray(int[] array)
   ```

3. Write a third method called **`printArray`** that accepts one integer array as argument and prints all elements of the array.

   You may use the following header for this method:

   ```
   static void printArray(int[] array)
   ```

   NOTE:

   - Declare and initialize the array without taking input from user.
   - Declare and initialize an integer array, call the method **`sortArrayZeroOneTwo`**. This method will then call the **`isValidArray`** method and will only sort the array if it gets **true** as the result.
   - Print the array before and after calling the **`sortArrayZeroOneTwo`** method.

1. Create a program called **ArraySortLab2.java.**
2. Correctly display appropriate messages.

Task #6: Arrays and Methods

In this task, you are being asked to write methods that manipulate arrays in Java.

Write a method called **`sumOfArrays`** which will take two integer arrays as argument and return an integer **array** having the sum of these two arrays.

You may use the following header for this method:

```
public static int[] sumOfArrays(int[] arrayA, int[] arrayB)
```

For example, if we pass **`{1, 6, 5, 11, 18, 12}`** and **`{3, 1, 4, 2, 2, 12}`** to this method, then the method should return **`{4, 7, 9, 13, 20, 24}`** as an integer array.

NOTE: Declare and initialize the array without taking input from user.

1. Create a program called **SumArraysLab2.java.**
2. Correctly display appropriate messages**.**