GIFT School of Engineering and Applied Sciences

Spring 2022

CS-240: Object-oriented Programming

Lab-4 Manual

File I/O (Scanner for Read and Write)

v1.4
5/28/2022

Task #1: Writing to the file

In this task, you are being asked to write to the text file in Java.

Write a program to write your name, id, and discipline to the file named ***output-1-4.txt.*** In the first line, write your name, in the second line write your Id, and in the third line write your discipline.

An ***example*** of the output could be:

Fatima

21105785

BS Computer Science

NOTE: Write the output to the ***output-1-4.txt*** file.

1. Create a program called **FileOutputLab4.java**.
2. Correctly write the output with appropriate messages.

Task #2: File I/O

In this task, you are being asked to write and read to and from the text file in Java.

Write a program to read from file named ***input-2-4.txt.*** In this file, there are three integer numbers separated by spaces. Read all the numbers and calculate the sum, then write the sum in the output file named ***output-2-4.txt.***

For example, if the contents of the file are **`10 5 6`** then the program, should write **`21`** to the output file.

NOTE: Read the input from the ***input-2-4.txt*** file.

Write the output to the ***output-2-4.txt*** file.

1. Create a program called **FileIOSumNumbersLab4.java**.
2. Correctly write the output with appropriate messages.

Task #3: Arrays, Methods and File I/O

In this task, you are being asked to write methods that manipulate arrays, and write and read to and from the text file in Java.

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

You may use the following header for this method:

```
public static void productEvenOdd(int[] array)
```

For example, if we pass **`{5, 6, 1, 9, 2, 7, 4, 9, 2}`** to this method, then the method should print:

```
Product of all even numbers: 96
Product of all odd numbers: 2835
```

1. **NOTE:** Read the input from the ***`input-3-4.txt`*** file.
   Write the output to the ***`output-3-4.txt`*** file.

2. Create a program called **FileIOArrayProductEvenOddLab4.java**
3. Correctly display appropriate messages.

Task #4: Arrays, Methods and File I/O

In this task, you are being asked to write methods that manipulate arrays, and write and read to and from the text file in Java.

1. Write another method called **`arrayToNumber`** that accepts one integer array as argument, converts all elements of the array to an integer number, and then returns that number.

   You may use the following header for this method:

   ```
   static int arrayToNumber(int[] array)
   ```

   For example, if we pass **`{3, 5, 4, 9, 12, 4}`** to this method, then the method should return **`3549124`** as an integer number.

2. Write another method called **`reverse`** that accepts one integer number as argument and returns the reverse of the number.

   You may use the following header for this method:

   ```
   static int reverse(int number)
   ```

   For example, if we pass the number **`3549124`** to this method, then the method should return **`4219453`** as the reverse of the number.

3. Write a third method called **`isPalindrome`** that accepts one integer array as argument and returns **true** if all the elements of the array form a palindrome number or **false** otherwise.

   You may use the following header for this method:

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

   A palindrome number is a number whose value is same if it is read backwards. For example, **`512434215`** is a palindrome number. If it is read backwards, the number remains the same.

   NOTE:
   - Read the input from the ***`input-4-4.txt`*** file.
   - Write the output to the ***`output-4-4.txt`*** file.
   - First, call the **`isPalindrome`** method. This method will then pass the value to the **`arrayToNumber`** method,
   - The **`isPalindrome`** method should then pass the returned value to the **`reverse`** method,

- When it receives the return value from the **`reverse`** method, the **`isPalindrome`** method will compare the value returned from the **`arrayToNumber`** method and the value returned from the **`reverse`** method. It will then returns **true** if both values are equal or same.

1. Create a program called **FileIOArrayPalindromeLab4.java**.
2. Correctly write the output with appropriate messages.

Task #5: Arrays, Methods and File I/O

In this task, you are being asked to write methods that manipulate arrays, and write and read to and from the text file in Java.

Write a method called **`isFibonacci`** which will take an integer array as argument and return **true** if the sequence of the array elements are a *Fibonacci* series, or **false** otherwise.

You may use the following header for this method:

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

A *Fibonacci* series is a series of numbers where every next element is the sum of two previous numbers.

For example, starting from **`0,`** and **`1`** (first and second numbers), the third number is the sum of these **`0`** and **`1`**. Now the series will become **`0, 1, 1`**

The *fourth* number is the sum of *second* and *third* numbers which is **`2.`** Now, the Fibonacci series of four numbers is **`0, 1, 1, 2`**.

And so on.

The following series is a Fibonacci series.

```
0, 1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144
```

NOTE: Read the input from the ***`input-5-4.txt`*** file.
Write the output to the ***`output-5-4.txt`*** file.

1. Create a program called **FileIOFibonacciLab4.java**.
2. Correctly write the output with appropriate messages.

Task #6: String, Methods and File I/O

In this task, you are being asked to write void methods that manipulate String, and write and read to and from the text file in Java.

Write a method called **`splitString()`** that accepts one **String** argument which contains the ***name***, ***id***, ***age*** and ***gender*** of a person. All these person information are **comma separated**. Your task is to separate all these information from the string and prints them line by line with appropriate messages.

You may use the following header for this method:

```
static void splitString(String line)
```

You need to use the **`split`** method of the String and pass the comma (,) to it as an argument.

For example,

```
String personInformation = "Abdullah, 17144001, 20, male";
String[] arrayInformation = personInformation.split(",");
```

The second line of the code above will split the information by comma and copy them to the **arrayInformation** array variable**.** Each index of the **arrayInformation** will have one value in it. For example, the 0^{th} index of the **arrayInformation** will only have "**Abdullah"** in it.

NOTE: Read the input from the ***`input-6-4.txt`*** file.
Write the output to the ***`output-6-4.txt`*** file.

4. Create a program called **FileIOStringSplitLab4.java**
5. Correctly write the output with appropriate messages.

CP-: Arrays, Methods and File I/O

In this task, you are being asked to write void methods that manipulate String, and write and read to and from the text file in Java.

1. Write a method called **`reverseString()`** that accepts one String argument, and returns the reverse of the String.

   You may use the following header for this method:

   ```
   static String reverseString (String word)
   ```

2. Write another method called **`isPalindrome()`** that accepts one String argument, and write "***Yes, the string is palindrome***" if the String is a palindrome or ***No, the string is not palindrome***" otherwise.

   You may use the following header for this method:

   ```
   static void isPalindrome (String word)
   ```

   You should make use of the **`reverseString()`** method inside the **`isPalindrome()`** method.

A palindrome string is a string that reads the same backwards as forwards. For example, civic level, madam, mom, noon, racecar, rotator, and stats.

Hint: Read a String from file, call **`isPalindrome()`** method, this method will get the reverse of the string from **`reverseString()`** method and will compare if the original string and the reverse of that string are equal, and write to the output file accordingly.

NOTE: Read the input from the ***`input-1-4.txt`*** file.
Write the output to the ***`output-1-4.txt`*** file.

1. Create a program called **FileIOStringPalindromeLab4.java.**
2. Correctly write the output with appropriate messages.