University of Windsor

SCHOOL OF COMPUTER SCIENCE
03-60-212 – OOP USING JAVA
SUMMER 2014

LAB – 4

[To get the **full marks**, complete and show your works to the Lab Instructor before the end of the Lab period. Lab works submitted in the next Lab will get a maximum of **75% marks**, if you attend this Lab, and a maximum of **50% marks**, if you do not attend this Lab.]

Objective:
File I/O and Recursion

Problem 1:

1. Write a class called ***FileWriter*** that will be used to create and write into a text file in the current directory. The class should have atleast the following members.
   a. A public method called ***write*** that takes a ***String*** object as its parameter and does the followings:
      i. It creates an object (say ***outFile***) of the ***FileOutputStream*** class created by passing two arguments to its constructor, the first being the name of the file as ***"testFile.txt"***, and the second as the boolean value "***true***" needed for appending a file.
      ii. The method then creates another object (say ***writer***) of class ***PrintWriter*** by calling its constructor that takes, as its argument the ***FileOutputStream*** object (***outFile***) that was just created.
      iii. The method then calls the ***println()*** method of ***writer*** with the ***String*** passed to it as its parameter.
   b. The whole process should be done within a ***try-catch*** bloc to avoid any error that might occur during opening and writing into a file.
   c. Import the required file processing classes, like
      java.io.PrintWriter,
      java.io.FileOutputStream and
      java.io.FileNotFoundException.

2. Write a class ***MathWork*** with the following members:
   a. Method ***printMenu()***, that will print a menu to provide the user a choice of three operations –factorial, fibonacci and gcd.
   b. Method ***factorial()*** that will ask for a number to enter (less than 15) and will ***recursively*** calculate the factorial of the number.
   c. Method ***fibonacci()*** that will ask for a number to enter (less than 35) and will ***recursively*** calculate the corresponding fibonacci of the number.

d. Method ***gcd()*** that will ask for two numbers to enter and will ***recursively*** calculate the GCD of the numbers.
e. All the methods, except the ***printMenu()***, after calculating the results, will print a string describing the result (as in the sample output). The methods then create an object of the ***FileWriter*** class, that you have just defined, and will call the ***write*** method of the object using the same string explaining the result, to write into the file.

3. You can define any helper methods that you may need.

4. Test your classes with the test class provided.

Three sample lines from the output file:

```
Factorial 0f 10 = 3628800
The 20th Fibonacci number = 6765
GCD of 24 and 56 = 8
```