TP Java Clean Code – FP style

Part 1

Q1 :

- Create a Class Q1 and in a main method :
- Create two optional of your choice in two different ways.
- Explore the optional API and use at least 5 different methods in your hand.

Q2 :

- Create a q2 package
- Create a functional interface named LengthCalculator with a calculate method
- Create an implementation of this interface named LastNameLengthCalculator
- Use this implementation in a main class with your last name.
- Create an implementation of LengthCalculator named FirstnameLengthCalculator in your main
- Create a lambda named CityLengthCalculator and use it.
- Write this same lambda with 3 different syntaxes
- Explain in comments with your own words and research what is a lambda and a functional interface

Q3 :

- Create a Q3 class:
- Create a method that retrieves the second element of a string list and test it in the main
- Create a method that retrieves the second element of a list of Integer and test it in the main
- Create a generic method that retrieves the second element of a list of unknown type
- Explain in comments with your own words and research what is genericity in java

Q4 :

- Create a package Q4 :
- Create a functional interface named StartWithGreg with a method checkName which
- returns a boolean depending on the string in parameter
- In main, create and use a lambda associated to this interface
- In the main, create and use a predicate (java.util.function.Predicate) with the same behavior.
- Create a functional interface named GenerateRandomNumber with a create method which returns a number between 0 and 100 and which has no parameter
- In main, create and use a lambda associated to this interface
- In main, create and use a supplier (java.util.function. Supplier) with the same behavior.
- Create and use an initializeIntegerList function with two parameters, the size of the array and a supplier of integer.
- Create and use an initializeList function with two parameters, the size of the array and and a supplier of type generic.
- Use this last method to generate a list with random numbers, and a with random letters
- Create and use a consumer that will display a welcome message according to the nickname passed in parameter.
- Create and use a java.util.function.Function which like the Q2 calculates the size of a string in parameter
- Create and use a java.util.function.BiFunction with put the parameter 1 to the power "parameter 2".
- Explain in comment with your own words and research what are a Predicate,
- Supplier, consumer and function. How does this relate to functional programming?

Q5 :

- Create package Q5 In this exercise you need to find the most suitable stream functionalities
- Create a list of string with duplicate éléments
- Count the number of distinct elements check if one of the strings of the list contains a letter
- Get a list of all the string starting with a letter of your choice (without duplicate)
- Get a list of integers of the ascii code of the first letter of each non duplicated string (by order asc) (Hard: so optional, only if you have of lot of time)
- Return a map with as key a letter and as value the occurrence in all the string of your list (with the duplicate)
- Create a class student with two attributs name and grade. Create a list of multiple students and sort the students by grade using a lambda to compare.

Q6

- Create a Q6 package
- Create a generic method named buildAnything with 3 parameters: a generic supplier : a generic consumer and a consumer of exception type
- The method will get the supplier value then send it to the consumer. If an error occurs in the catch the exception consumer can consume the raised exception.
- You can try this method with a supplier suppling a number, a consumer who print, and an exception consumer who print the exception message.