

***Fresher Software Developer***

## **Coding Tests**

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**RECORD OF CHANGES**

No	Effective Date	Change Description	Reason	Creator	Reviewer
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**CODE : FR.ET.Practice.02****TYPE : Long****LOC : N/A****DURATION: 180 MINUTES**

## General Instruction

- The candidates can use the following tools and programming language to solve the problems:
  - o IDE (Eclipse, IntelliJ IDEA, Microsoft Visual Studio...)
  - o Programming language: Java, C#, VB.Net...
- All the problems described below are general specifications; and there are no mandatory business rules or technical requirements. The candidates can freely give their solutions or any ways of solving problems.
- After completing the test, commit source code to github/gitlab or share it from Google Drive.

## Problem 01: Data Structures and Algorithms

### Objectives:

The main purpose of this test is to evaluate the ability of the followings to solve a specific problem.

- Data Structures and Algorithms
- Fundamentals of programming techniques (variable declarations, use of loops, use of decisions or selections...)

### Technologies:

- There are no mandatory technical requirements for the problem.

### Problem Statement:

Write a console program which is used to process a string and return the longest word in that string. Keep in mind that if there are two or more words with the same length, return the first word from the string with that length. Words can contain numbers, for example "Java is great123".

#### **Example 1:**

- Input: "Java is interesting"
- Output: interesting

#### **Example 2:**

- Input: "I like Java"
- Output: like

**Note:** The user should input a string from the keyboard.

### Assessment Criteria:

The program must be successfully compiled without any errors and satisfy the following aspects:

- **Functional Requirements:** perform the operation to find the longest word in a string. There must be a method defined to solve the problem.

- **Input/Output:** the user should input data from the keyboard. The output of the program should be displayed on the console.
- **Coding Standards:** coding conventions must be applied (naming convention, code format, comments in code...).

## Problem 02: Object Oriented Programming

### Objectives:

The main purpose of this test is to evaluate the ability of the followings to solve a specific problem.

- Fundamentals of programming techniques
- The implementation of OOP principles in programming

### Technologies:

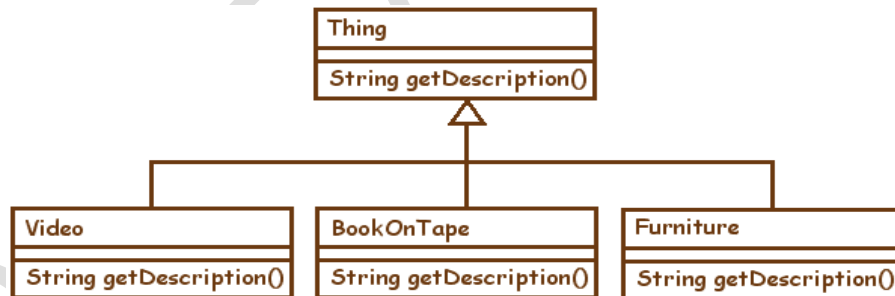
- Object Oriented Methodology
- The candidates are free to choose or apply any technologies for the project such as JDBC, ADO.NET, ORM...

### Problem Statement:

Write a console program to solve the problem described below using OOP approach.

**Rudy's Rental System** (RRS) rents all sorts of stuff: videos, books on tape, furniture, etc. Everything that Rudy rents has a serial number. Write a program called **Lookup** that takes in a serial number and writes information on a given item to the console. You will need to make an abstract class called *Thing* and three subclasses: *Video*, *BookOnTape* and *Furniture*. There will be an abstract method called *getDescription()* that returns a String.

Here is a UML diagram showing the three sub classes inheriting *Thing*.



**Lookup** will contain a data structure that contains a dozen things to rent. Make up whatever things you like as long as you use all three types. Give each of your classes relevant attributes and have the *getDescription()* method return as much information on an item as possible.

Develop a console application that simulate the following features:

**Question 1:** Provide a function for the user to input data for three things (*Video*, *BookOnTape*, *Furniture*) from the keyboard.

**Question 2:** Provide a function to show all information of furniture on the console.

**Question 3:** Provide a function that takes in a serial number and writes information on a given item to the console.

**Note:** The candidates can do whatever to solve the problem. Keep in mind that the following aspects should be considered:

- A data structure for data storage (text file or relational database...)
- A mechanism or technique for data storage and data manipulation such as JDBC, ADO.NET or ORM
- A graphical user interface for the user to input data values

### **Assessment Criteria:**

The program must be successfully compiled without any errors and satisfy the following aspects:

- **Functional Requirements:** all functionalities must work properly; there is no error during the execution of the program.
- **Input/Output:** the program must provide a console UI so that the user can easily interact with the application. The output of the program should be displayed on the console.
- **Coding Standards:** coding conventions must be applied (naming convention, code format, comment in code...).
- **Program structure:** the program must be well-organized followed OOP approach (class definition, method definition, package or namespace structure, the implementation of OOP principles such as inheritance, polymorphism, abstraction, or encapsulation).

-- THE END --