**4COSC0010C Programming Principles II (PP02)**

**Assignment: Individual Programming Assignment (“Computer Consultancy Firm”)**

**Assignment Marks: Marked out of 110, (15% of ICT01)**

**Set Date: 4th March 2019**

**Deadline: 1st April 2019 by 1:00pm to BB**

**Background Information**

This assignment tests your understanding of and the ability to apply the programming concepts you have learned in the course so far, including the usage of user-defined data types, selection, iteration, methods and data structures.

**Design**

It is important to take the time to properly design a solution before starting to write code. Hence, this assignment requires you to *write and submit the use case diagram, use case descriptions, class diagram and activity diagram of your program design* as well as the code for the program.

**Assignment Requirements**

You have been asked to create a java application, using JavaFX for the front-end and NoSQL based database or MySQL for the database (You can also use flat files instead of databases. However, bonus marks will be awarded if databases are used.), to keep the cost low for a small computer consultancy firm with a number of employees. Create the design for the following problem description, and then convert it to a JavaFX based application. State any assumptions/notes you make, that influence your design and implementation.

You have the following details from the owner of the firm:

“I run a small computer consultancy firm with a number of employees. Along with the basic information about the employees (name, DoB, contact details, etc.) I need to be able to keep track of what type of role they perform, such as Hardware Technician, Programmer, and Software Installer. A single employee can perform multiple roles, and each role has an associated hourly pay.

I need to keep name and contact details of all customers that have a contract with us. A customer can have multiple contracts at the same time, but each contract is only associated with one customer. Each contract has a name, a description, a creation date, and a job type – e.g. System Development, Software Upgrade. No details of job types need to be captured other than their name. Each contract also has a single employee designated as the project leader. One employee may be the project leader of multiple contracts.”

**Question 01:-**

1. Draw the Use case diagram with possible relationships **[05 marks]**
2. Write use case specification for each of the use cases identified in the above use case diagram using the template given by Alistair Cockburn **[10 marks]**
3. Derive the final set of Functional and Non-functional requirements and also state any assumptions and notes that influence the design **[05 marks]**
4. Identify the classes, attributes and operations and draw the class diagram for the given problem with possible relationships, multiplicities, etc.**[10 marks]**
5. For each of the use cases identified in the use case diagram, draw the corresponding activity diagram **[10 marks]**
6. Create the UI using JavaFX for the Functional requirements stated above **[10 marks]**
7. Create the necessary logics to make the application work **[20 marks]**
   1. Make sure your application works for Create, Retrieve, Update and Delete activities identified in the case study
   2. Good coding practices **[10 marks]**
8. Store data preferably in NoSQL database (bonus marks of 10), SQL database (bonus marks of 05) or file (no bonus) **[10 marks]**
9. Make a test plan (boundary value and invalid value) and execute the test for each of the identified functionalities and state the percentage of test case passed **[10 marks]**
10. **Your report MUST consists of:**
    1. **Introduction (DO NOT copy and paste)**
    2. **Analysis**
    3. **Design**
    4. **Implementation – DO NOT copy and paste auto generated code – add only the code you wrote**
    5. **Testing (boundary value and invalid value)**
    6. **Conclusion**
11. Use only IntelliJ or eclipse. NO for Netbeans
12. No marks will be awarded if the implementation isn’t done BUT only the design is available

**Submission of Deliverables**

Once your assignment is complete, submit both your **design** (PDF or DOC format – no .pages files) and **source code** (“.java” file) to the appropriate location on the blackboard. You will need to create a ZIP file (NOT RAR, ARJ or other archive) and submit the one zipped file. An assignment cover sheet is not required, but be sure to **include your name and student number at the top of both files**.

**Referencing, Plagiarism and Collusion**

The entirety of your assignment **must be your own work** (unless otherwise referenced) and produced for the current instance of the module. Any use of unreferenced content you did not create constitutes plagiarism, and is deemed an act of academic misconduct. All assignments will be submitted to plagiarism checking software, which includes previous copies of the assignment. Remember that this is an **individual** assignment. Never give anyone any part of your assignment – even after the due date or after results have been released. Do not work together with other students on individual assignments – helping someone by explaining errors in their code/logic or directing them to the relevant resources is appropriate, but doing it for them or showing them how you did it is not. An unacceptable level of cooperation between students on an assignment is collusion, and is deemed an act of academic misconduct. If you are uncertain about plagiarism, collusion or referencing, simply email your tutor, lecturer or module leader and ask.