FACULTY OF INFORMATION AND COMMUNICATION TECHNOLOGIES
FALL 2022
FINAL EXAMINATION

Course title	**Introduction to Mobile Application development**
Course code	**CS 3410**
Instructor	**Engr. Daniel Moune**
Date	
Duration	**03 hours**

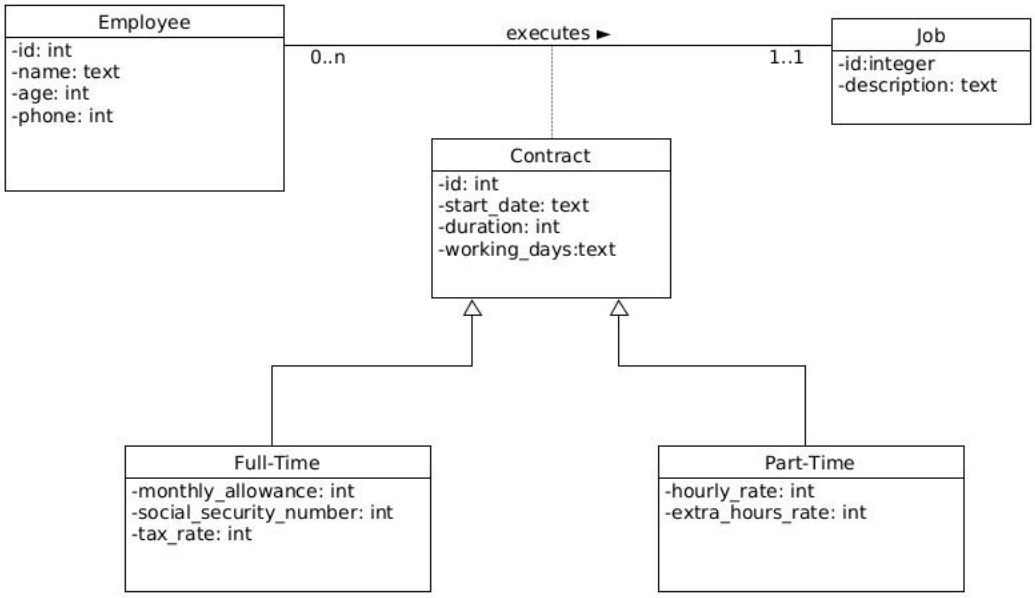
INSTRUCTIONS

- **This examination is closed-book, closed-notes.**
- **Candidates are allowed to use their computers for producing code, but should not have access to internet.**
- **This paper is made of two sections.**
- **All questions in Section A are compulsory and their answers should be written on the answer sheet provided by the administration.**
- **Choose 01 question out of the 03 offered in section B.**
- **After the exam, you should upload a document on moodle later today before midnight. This document should have a link to the ZIP containing the code for Section B. For those using a GitHub account, you can provide a link to your GitHub repository in that document.**
- **Clearly write your registration number on each answer sheet used.**

Section A: (10 marks)

Note: *All questions are compulsory*

You are applying for a position of junior software Engineer for a company called "BadSoft". Your supervisor would like to evaluate your ability to analyze and design mobile applications and presents to you the following system architecture.



1. Name and describe the *main components* of **modern applications** architecture and for each of component describe it's role **(2.5marks)**

2. One of the components you described above is responsible for providing *access to database* through an API. Name and describe the **03 models** used in database design then tell us which of these models the figure presented above corresponds to *(justify your answer with 02 solid arguments)* **(2.5marks)**

3. Exploit the figure presented above to produce the diagram of the **logical model** of this database. Explain which *rules were applied to produce the foreign keys* and the relational tables expected in your logical model **(2.5marks)**

4. The API you are required to build should provide basic **CRUD** *(Create, Read, Update, Delete)* service through some special classes that would bring those methods. Complete your logical diagram by adding the specific classes that would provide CRUD service for each of your relational table. Make sure each API class you add is described with it's CRUD methods in the diagram **(2.5marks)**

Section B: (30 marks)

Note: *Choose 01 question out of the 03 provided.*

*Keep in mind that your answer will be evaluated using the following scheme: data structures definition **(10marks)** - main code showing how to execute methods **(10marks)** - good handwriting **(5marks)** - clean presentation **(5marks)***

1. From the model you provided in question 4 of Section A of this paper, select one of the relational table with its related API class then produce **all the source code** that would be required to build and run a *basic GUI application using C++ and QT framework* as your programming environment. **(30marks)**

2. From the model you provided in question 4 of Section A of this paper, select one of the relational table with its related API class then produce **all the source code** that would be required to build and run a *basic GUI application using Python and PyQT framework* as your programming environment.. **(30marks)**

3. From the model you provided in question 4 of Section A of this paper, select one of the relational table with its related API class then produce **all the source code** that would be required to build and run a *basic GUI application using Java and JavaFx framework* as your programming environment.. **(30marks)**