School of Information Technology
Department of Computer Science

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Faculty of Engineering, Built Environment and Information Technology

COS326 - Database Systems
Practical 1 2022

Release Date: 04 August 2022
Submission Date: 12 August 2022 at **07:00 Hrs**
Lecturer: Mr S.M. Makura
Total: 50 Marks

A. Objectives

Demonstrate that you can use ObjectDB for Java to insert, modify, retrieve and delete objects from a ObjectDB database and that you understand ObjectDB.

In this practical you will have to write a Java program that:

1. Implements Java classes and makes them persistent by storing them in a ObjectDB database
2. Executes queries on the ObjectDB database.

B. Submission Procedure:

1. Create a folder as follows:

   The folder name should be ***uXXXXXXXX*** (*XXXXXXXX is your student number)* and should contain the following sub-folders:

   a. **Application: c**ontains your .jar file, as well as any other files necessary to execute your application (this will be opened for marking).
   b. **Source:** all your .java project files go here (your java project will be compiled and executed during marking)

2. Create a zip file of the folder and upload it to ClickUP via the submission link provided for practical 1.

NO LATE submissions will be accepted after the submission date and time has lapsed. **Do not** wait till the last minute to submit and start giving excuses that you faced technical challenges when you tried to submit.

Question 1: ObjectDB Database Programming

Create a Java application using NetBeans or any Java IDE you are comfortable with. The Java program must interact with an ObjectDB database and must have the following files/capabilities:

(a) Consist of a Java Swing or JavaFX GUI which must allow the user to enter the following student details:
   (i) Student Name
   (ii) Student Surname
   (iii) Degree
   (iv) Student Number

(b) The Java application must allow the user via the GUI to perform CRUD operations on the ObjectDB database. You will also need a main class where you will implement all the methods necessary to perform the CRUD operations. The CRUD operations expected are:
   (i) **Create/Store** a(n) student object with the details provided in (a) and save it in the ObjectDB database through a save button. . Use an appropriate Java Swing/GUI control to display a message to confirm if the operation has been done successfully. You will need to create an Entity class called **Student** with all the necessary variables, getters and setters
   (ii) **Read** one or all student details from the ObjectDB database and display it via the GUI interface, i.e have a search button to search student details based on the student number then use an appropriate Java Swing / JavaFX GUI control to display the results.
   (iii) **Update** specified student details i.e have an update button which when clicked, will update any of the student details specified in part (a). Use an appropriate Java Swing/JavaFX GUI control to display a message to confirm if the operation has been done successfully.
   (iv) **Delete** specified student details i.e have a delete button which when clicked, will delete all the student details of the student. Use an appropriate Java Swing/JavaFX GUI control to display a message to confirm if the operation has been done successfully.

Ensure that your application handles any basic exceptions. Full marks will be awarded for a fully functional Java application based on specification.

[Total Marks: 50 Marks]