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COURSEWORK 1:	Semester Long Autumn 2020

Module Code:	**CC5051NA**
Module Title:	**Databases Systems**
Module Leader:	**Yunisha Bajracharya** (Islington College)

Coursework Type:	**Individual**
Coursework Weight:	This coursework accounts for **50%** of your total module grades.
Submission Date:	**Week**
When Coursework is given out:	**Week 7**
Submission Instructions:	Submit the following to Islington College RTE department before the due date: 　　　**Documentation Folder** 　　　　● **soft copy of the report** 　　　**Development Folder** 　　　　● **.dmp file of the database** 　　　　● **.sql file of the queries**
Warning:	London Metropolitan University and Islington College takes Plagiarism seriously. Offenders will be dealt with sternly.

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Plagiarism Notice

You are reminded that there exist regulations concerning plagiarism.

Extracts from University Regulations on Cheating, Plagiarism and Collusion

Section 2.3: "The following broad types of offence can be identified and are provided as indicative examples

(i)   Cheating: including copying coursework.

(ii)   Falsifying data in experimental results.

(iii)   Personation, where a substitute takes an examination or test on behalf of the candidate. Both candidate and substitute may be guilty of an offence under these Regulations.

(iv)   Bribery or attempted bribery of a person thought to have some influence on the candidate's assessment.

(v)   Collusion to present joint work as the work solely of one individual.

(vi)   Plagiarism, where the work or ideas of another are presented as the candidate's own.

(vii)   Other conduct calculated to secure an advantage on assessment.

(viii) Assisting in any of the above.

Some notes on what this means for students:

(i)   Copying another student's work is an offence, whether from a copy on paper or from a computer file, and in whatever form the intellectual property being copied takes, including text, mathematical notation, and computer programs.

(ii)   Taking extracts from published sources without attribution is an offence. To quote ideas, sometimes using extracts, is generally to be encouraged. Quoting ideas is achieved by stating an author's argument and attributing it, perhaps by quoting, immediately in the text, his or her name and year of publication, e.g. " e = mc2 (Einstein 1905)". A reference section at the end of your work should then list all such references in alphabetical order of authors' surnames. (There are variations on this referencing system which your tutors may prefer you to use.) If you wish to quote a paragraph or so from published work then indent the quotation on both left and right margins, using an italic font where practicable, and introduce the quotation with an attribution.

Further information in relation to the existing London Metropolitan University regulations concerning plagiarism can be obtained from http://www.londonmet.ac.uk/academic-regulations

CC5051 Databases

This module is assessed by coursework (50 For the coursework, the students are required to develop an application for an organization based on **the given scenario**.

The coursework / assignment should at least cover all the following but should not be limited only to these features / functionalities:

- Creation of objects – Entities and Attributes
- Creation of Relationship Types
- Identify and include constraints (Such as not null, unique, Supertype, Subtype, etc.)
- Identify and include Primary Keys, Foreign keys, and unique keys.
- Normalization of the Relationships (3NF) with Explanation of the process with reasoning.
- Draw 2 ER Diagram, for **initial** (before normalization) and **final** (after normalization) with entities and relationships.

This coursework is about designing and implementing databases for a private college.

1. **Introduction**

    a.   Introduction of the College, its forte, aims and objectives.

    b.   Description of **Current Business Activities and Operations** like how the College functions and how Student's and Instructor's records are handled.

    c.   List of **Business Rules** that derived from the description of Operational Procedures that will be used in the system. Note: Remember a business rule ensures which data is to be stored in the database and how the College intends to use the data. The rule affects the structure of the database schema.

    d.   **Identification of Entities and Attributes**. The coursework should create the objects and attributes that are related to requirements gathered. The initial Entity Relationship Model should be listed in this section and should include:

    i.List of the created objects – Entities and Attributes

    ii.Identification and representation of the Primary Keys, Foreign Keys.

    iii. Entity Relationship Diagram of the identified Entities with attributes (Initial ERD)

2. **Normalization**

Normalize the data collected from Unnormalized form to **Third Normal Form** with valid process description. Produce a set of fully normalized tables for the system as described in the case study. Show clearly all the steps of normalization. Demonstrate that each of your relations is in third normal form (3NF) by displaying the functional dependencies between attributes in each relation. **You may also add additional attributes where appropriate throughout the stages of normalization.**

Note: if any of your relations are not in 3NF, this may indicate that your ER model is structurally incorrect or that you have introduced errors in the process of deriving relations from your model.

    a.   Draw the **Final Entity-Relationship diagram** with the Entities and its relationships derived from Third Normal Form. Also **explain the type of ERD** you are using with explanation of notations and relations.

    b.   State clearly any **Assumptions** you have made and show any elimination of redundancies by consolidation of your answers to the entities and relationships created during the decomposition of relationships and/or any refining of your original Entity Relationship Diagram (ERD)

Minimum of 5 Tables must be developed after the normalization.

3.   Implementation

Using Oracle SQLPLUS and submit adequate documentation for the following:

    a.   Create **relations** for the college database with the SQL Command and list the image of its resulting output. Create the tables for the database. Where appropriate set field and table properties, including any required indexes. Ensure that referential integrity is established between related tables.

    b.   Populate them with appropriate test data that is relevant to the questions listed below. List the screenshots of the SQL Command used and the overall rows of the table with an image of its resulting output. Enter some test data (**at least 7 rows**) into each table. Include the screenshot of the INSERT SQL Statement used to populate table data along with the TABLE's CONTENT displayed using SELECT statements.

    Note: The bridged entity will have double the listed rows

- Produce an SQL statement for all the queries stated of the company. State the purpose of each query and present the obtained results to demonstrate the breadth of your SQL knowledge. Implement all the queries asked in Questions. Provide the separate screenshots of each query that includes the Oracle SQL Command and image of its resulting output, with valid question number.

Case Study A: College Record System

Select any college for the creating a record system (You can choose your college as well or any other, but the college should be genuine). Formulate its business activities, operations, and the business rules. Analyze the scenario given below to design the database schema.

Note: Make sure to declare your attributes in such a way that ensures the successful execution of every information and transaction queries.

The proposed College database should be able to keep track of all people. For each person, it records all his / her address, of which exactly one is designated as the mailing address. Each address consists of country, province, city, street, house number and a list of phone numbers to the location of the address and a list (possibly empty) of fax numbers to the location of the address. A college contains many courses (BBA, IT, MBA, etc.). Each course can offer any number of specifications (computing, networking, marketing). Each specification contains several modules (Database, Programming, etc.) and also one module can fall under different specifications. Many instructors can be associated in a course, but an instructor can be associated only in one course. For each course, there is a course leader, and an instructor can be a leader of only one course. Each instructor can teach any one or many modules at a time, and a module can be taught by many instructors. A student can enroll for any one course and each course can have any number of students. Each module is taught in any given particular class, but in each class a number of modules are taught.

Use SQL to answer the queries below:

Information Queries

i. List all the students with all their addresses with their phone numbers.
ii. List all the modules which are taught by more than one instructor.
iii. List the name of all the instructors whose name contains 's' and salary is above 50,000.
iv. List the modules comes under the 'Multimedia' specification.
v. List the name of the head of modules with the list of his phone number.
vi. List all Students who have enrolled in 'networking' specifications.
vii. List the fax number of the instructor who teaches the 'database' module.
viii. List the specification falls under the BIT course.
ix. List all the modules taught in any one particular class.
x. List all the teachers with all their addresses who have 'a' at the end of their first names.

Transaction Queries:

i. Show the students, course they enroll in and their fees. Reduce 10% of the fees if they are enrolled in a computing course.
ii. Place the default Number 1234567890 if the list of phone numbers to the location of the address is empty and give the column name as 'Contact details.
iii. Show the name of all the students with the number of weeks since they have enrolled in the course.

iv. Show the name of the instructors who got equal salary and work in the same specification.
v. List all the courses with the total number of students enrolled course name and the highest marks obtained.
vi. List all the instructors who are also a course leader.

Coursework Requirements

1. **Contents Page**
   A list of sections / subsections of the document, including page numbers. Also include the table of figures and list of tables with proper page numbering.

2. **Part 1- Introduction**   **(15 Marks)**

   1. **Introduction of the college**   **(3)**
   2. **Current Business Activities and Operations**   **(2)**
   3. **Current Business Rules**   **(2)**
   4. **Identification of Entities and Attributes.**   **(3)**
   5. **Initial E-R Diagram**   **(5)**
      1. Create an Entity–Relationship (ER) model of the data requirements for the **College Record System** highlighting all the entities, their attributes and relationship among them.
      2. State any assumptions necessary to support your design in the Assumption section.

1. **Part 2- Normalization**   **(20 Marks)**

1. **Part 3- Final Entity Relation Diagram**   **(15 Marks)**

1. **Part 4 – Database Implementation**   **(10 Marks)**

   1. **Tables Generation (DDL Scripts)**   **(5)**
   2. **Populate DB tables**   *(5)*

Note: *Use Oracle SQL Plus to populate these tables with suitable data values. Using any tools other than the specified one will result in **Zero marking.***

1. **Part 5 – Database Querying**   **(30 Marks)**

Note: *Before starting this section, please ensure that your tables contain sufficient data (at least 7 rows in each relation) to enable you to test the query transactions described in the above case study.*

i. **10 SQL Information Queries with screenshots**   **(15)**
ii. **6 SQL Transaction Queries with screenshots**   **(15)**

7. **Part 7- Screenshot of the Dump File created in the database with actual .dmp file.** **(5 Marks)**

8. **Part 8 - Conclusion** **(5 Marks)**

IMPORTANT

You must use Oracle SQL PLUS / SQL Developer to complete your coursework. Use of any other database products such as MS Access, MYSQL or Microsoft's SQL Server for any parts of this work will result in *zero marks*. Do not forget to drop all the tables and provide a screenshot of the code after creating the dump file (.dmp file).

Submit your work in a zip folder with the naming guidelines provided by RTE. Your folder should include the documentation of your coursework in PDF format along with the SQL scripts and accurate question number as file name. Submit your report to RTE before the deadline.

Include following formatting guidelines while writing the report

- Appropriate cover page provided in Google classroom

- Table of content with correct page numbering

- Table of figures if any

- Header: Subject name and subject code

- Footer: Student id and page number

- Font: Times New Roman

- Font Color: Black (Automatic) RGB (0,0,0)

- Font Size for heading: 14 Bold

- Font Size for paragraph: 12

- Font Size for Figure naming: 11 Italic

- Line Spacing: 1.5

– End of Paper –

You need to upload one Word document to Google Classroom