

Student ID: \_\_\_\_\_

Full Names: \_\_\_\_\_

# Databases and Software Development (CS418)

(January 2021)

Instructor: O. Kalu

## Midterm Integration Exercise (Part 2)

1. The exam (both parts 1 and 2) duration is 2 hours.
2. This part 2 of the exam is mostly computer-based; so you may use a computer for the database implementation and coding tasks.
3. To avoid distraction, make sure to switch-off your cell-phones or simply turn the ringer off.
4. **If you are taking the Exam remotely online, you are required to keep your computer camera on and stay visible at all times during the exam session. Failure to do so, will cancel and disqualify your Exam.**
5. **This exam is a copyrighted material and must not be taken away, or copied or photographed or reproduced or transferred or shared or distributed.**
6. You are expected to use a Database tool or an IDE or Code Editor of your choice to implement your solutions for the questions in this part.
7. Upon completion, make sure to put your entire work, **(including your design diagram(s), screenshots, code etc.)** into a single zip file named **MyExam1.zip**, and submit to Sakai, under the Assignment titled, “Exam1 - Part 2”.
8. NO CHEATING!!!

---

Make sure to include the screenshots of all your results, as required.

---

(CS418 - DBSD)  
(January 2021)  
Midterm Examination – Part 2 - (80 points)

**Database Design, Implementation & Problem-solving skills:** (80 points)

**Note:** *For the tasks in these questions, you are expected to take screenshot(s) of your work/result(s), paste/place them into a document named, Exam1CodeAndScreenshots (.doc or docx or .pdf only) and include this in the MyExam1.zip file, along with all your SQL code, which you will submit.*

**Also, when you take the screenshots, it should be of the entire computer screen (NOT a snippet or a window – see an example screenshot below, at the end of the question)**

**(80 points) Design and Implement a database for HighVay Supermarket's Products-Suppliers Management system**

Assume you have been hired by a local supermarket named, HighVay, to design and implement a database for their Products-Suppliers Management system, which they will be using to manage the inventory (list) of Products that they stock, along with the various Suppliers who do supply them with the products.

Each Product is supplied by a specific Supplier. And, a Supplier can supply many Products to the supermarket. The supermarket assigns a unique Product Identification Number to every product that they stock and they are also interested in maintaining the following pieces of data about each product: the product name, its unit price, quantity in stock and the date that it was supplied.

Each Supplier who supplies one or more products to the supermarket is given a unique supplier number and the supermarket also needs to maintain data about the supplier name and their contact phone number

(See some of the supermarket's existing data provided in Table1 below, which they require you to enter into the new database system. Notice that some Suppliers have not yet supplied any Products to the supermarket).

Product Id	Product Name	Unit Price	Quantity In Stock	Supplier No	Supplier Name	Phone No	Date Supplied
P0716	Organic Bananas	1.25	480	S101	United Organic Farms, LLC		2021-01-18
				S105	Valley View Bakeries, LLC	(319) 123-1322	
P1204	Apples – Golden Delicious	1.09	525	S101	United Organic Farms, LLC		2021-01-20
P1205	Avocados – Medium/Green	2.49	164	S103	El Segundo Agro Products	(641) 000-0001	
P0818	Eggland's Best Eggs – Large/Grade A	4.99	120	S102	Eggland Poultry Farms of Des Moines	(319) 001-1234	2021-01-22
				S104	Midwestern Farms, LLC	(641) 123-4567	
P3372	Brioche	1.89	96	S106	Boulangerie Robuchon		2020-12-31

**Table 1: HighVay supermarket's Products-Suppliers data**

For this task, you are required to do the following:

1. Identify and write-down the relevant Entity types for the database.
2. Identify and write-down the relevant Relationship types.
3. Create an E-R model (diagram) for the database (including the relevant entities, relationships, multiplicities etc.).
4. Implement your design in a physical database in MySQL. (**Note:** Include in your implementation, a mechanism such that when a Supplier is deleted from the database, it does NOT delete the products that have been supplied by the supplier, but rather, it sets the Supplier number to NULL).
5. Populate the database table(s) with the supermarket's data (given in the Table 1 above)
6. Execute SQL queries (or statements) for the following:
  - a. Display the list of all Products that have been supplied by the Supplier whose Supplier Number is S101. Include in your query result, the Product Id, Product Name, Unit Price, Quantity in stock, Date Supplied and the Supplier's name and Phone Number. Also, have this list be sorted by the Product Name, in ascending order.

- b. Display the Supplier details (including Supplier Number, Supplier name and Phone number) for the Product whose Product Id is P0818.
  - c. Display a list of all the Suppliers in the system, including both those that have supplied some products as well as those that have not yet supplied any products; and for each Supplier, show how many products they have supplied to the supermarket.( i.e. your query result should show, Supplier Number, Supplier Name, Phone number and NumberOfProductsSupplied).
  - d. Display the total value (in dollars and cents) of all the products that the supermarket has in stock.
- 7. Create a Database View named, ListOfAllSuppliersAndProducts, which displays a list of all the Suppliers and all the Products. Have this list be sorted in ascending order of the supplier names.
- 8. Say today is the 50<sup>th</sup> Anniversary of HighVay Supermarket and they will like to celebrate and say “Thank You” to their customers by reducing all their Product prices by 2%. Execute SQL DML code to reduce all unit prices of all products by 2%.
- 9. Assume that the supermarket has received information that the Supplier whose Supplier Number is, S101, has gone out of business and are no longer operating and so will no longer be supplying them with any products. Therefore, the supermarket will like to remove this supplier from the database. Execute SQL DML code to delete this supplier from the system.

Take screenshot(s) of all your database work/results, similar to the one pasted below:

Sample Database screenshot:

The screenshot displays the MySQL Workbench interface for a database named 'uniteddentalclinics-db'. The left sidebar shows the 'SCHEMAS' tree with 'uniteddentalclinics-db' expanded, listing tables (appointments, dentists, patients, surgeries), views, stored procedures, and functions. The main window shows a query editor with the statement: `SELECT * FROM `uniteddentalclinics-db`.appointments;`. Below the editor, the 'Result Grid' displays the following data:

patientNo	dentistNo	apptmtDate	apptmtTime	surgeyNo
P108	S1024	2013-11-12	10:00:00	S10
P108	S1024	2013-11-14	14:00:00	S10
P110	S1032	2013-11-15	18:00:00	S13
P100	S1011	2013-11-12	10:00:00	S15
P105	S1011	2013-11-12	12:00:00	S15
P105	S1032	2013-11-14	16:30:00	S15
NULL	NULL	NULL	NULL	NULL

Below the result grid, the 'Action Output' panel shows the execution log:

#	Time	Action	Message	Duration / Fetch
1	12:57:49	SELECT * FROM `uniteddentalclinics-db`.patients LIMIT 0, 1000	4 row(s) returned	0.000 sec / 0.000 sec
2	12:58:09	SELECT * FROM `uniteddentalclinics-db`.dentists LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
3	12:58:27	SELECT * FROM `uniteddentalclinics-db`.surgeries LIMIT 0, 1000	3 row(s) returned	0.000 sec / 0.000 sec
4	12:58:44	SELECT * FROM `uniteddentalclinics-db`.appointments LIMIT 0, 1000	6 row(s) returned	0.000 sec / 0.000 sec

//-- The End --//