Lakeside View Global Vision
CEGEP JOHN ABBOTT COLLEGE

CONTINUING EDUCATION FORMATION CONTINUE

Certificate Program in Full Stack Developer
Full-Time Day Training Program

(420-SA5-AB) Database

A. *General Information*

Parameters		
Course Number	420-SA5-AB	
Course Title (Long)	Database	
Course Title (Short)	DB	
Course Weighting	2-hour lecture + 3-hour laboratory + 3-hour homework	
Schedule Date:	Start Date: July 31, 2023	End Date: August 23, 2023
Schedule Time:	9:00 a.m. to 2:00 p.m.	
Classroom:	Online via Microsoft team	
Number of Credits (Units)	2.67	
Number of Hours of Instruction	75	
Competencies Statement(s) and Code(s)	00Q7 – Use a database management system	
Competencies Partially Met	Designing Relational Database	
Prerequisite course	420-JA4-AB	
Cohort	FSD-10	

Take Home Assignment 01

Deadline for submission: August 7, 2023
Late submissions will not be accepted.

Student Name	Student ID

Case Study 1 – The following exercise allows you to conceptualize a database

Using the following text, describe the Problem you are trying to solve. Determine which information is necessary to create a database (you must follow the Steps in Designing a Database covered in this course). Outline the database deciding which information will be saved in each table.

NOTE: Do not create a physical database.

Case Problem for this assignment

MovinOn Inc. is a Moving and Storage Company based in the northwestern United States. Having grown from a start-up venture consisting of one vehicle and one warehouse in Oregon, the company is burgeoning into other states and is outgrowing its paper-based recordkeeping system. The CEO of MovinOn Inc., David Bowers, hired an information system manager to design a database to manage employee, driver, customer, and order data. Your assistance is required to design the objects in the database so that the present inefficient system is replaced, and the new system is reliable upon

implementation. You will also assist in securing the database so that the company's data is not accidentally or maliciously deleted.

Creating the database design for MovinOn Inc.

MovinOn Inc. is a moving company that provides moving and storage services in Washington, Oregon, and Wyoming. MovinOn provides a truck, driver, and one or more moving assistants to move residential and commercial items from one location to another within the defined coverage area. In addition to moving services, the company provides temporary and long-term storage in its warehouses. MovinOn's customers are commercial and residential. Some of the storage warehouses are climatically controlled for customers who need to store items that are sensitive to extreme temperatures.

The business started in 1995 with a single truck and a single warehouse in Oregon. Due to a very satisfied clientele, the company has grown over the years a much larger business. Currently, MovinOn has one warehouse in each state it services and is working on a merger with another company that offers similar services in different service areas. When the merger is complete, MovinOn will acquire additional storage warehouses, trucks, and employees and will expand its operations into different states.

David Bowers is the CEO of MovinOn. In the past, David managed the business using a combination of spreadsheets and paper forms. However, with a merger in the company's future, David needs to expand his system to manage data better. David recently hired Robert Iko, an information systems specialist, to recommend and implement a new plan for managing the company's data.

Robert's first task is to understand the current system and its limitations by talking extensively with David about data management and user needs. David explains that the office in each state accepts reservations for moving and storage services by completing a form that includes the customer's name, address, phone number, and the job's details. Jobs that involve trucking items from one location to another or from an outside location to a storage unit in a warehouse are maintained in a filing cabinet that is organized by customer name. Leases for storage space are stored alphabetically in a separate filing cabinet for each warehouse. All the forms are stored in the on-site offices at the warehouse from which they were purchased.

Unfortunately, David admits that forms are often lost or misplaced and sometimes contain inaccurate or missing data. In addition, when a customer requires the services of another warehouse, a MovinOn employee must copy the customer's record and send it to the second warehouse so that it is on file at the second location. David wants the new system to be capable of sharing data between the three warehouses and any warehouses that the company acquires in the future so that it is easy for the company to share and maintain data.

Each warehouse has its own manager, office staff, and moving assistants. Drivers are contract employees and can work for any warehouse. David wants the new system to manage employee data, including personal information, salary information, and work performance.

In addition to managing personnel data, David also wants to use the new system to manage information about drivers, including their personal information and driving records. The system also needs to store information about the trucks and vans that MovinOn owns and operates.

Finally, the system must maintain data about customers who utilize moving and storage services. Some customers might require storage in more than one location. When there is a request for services, the

requests are recorded on forms. In addition to the job order form, a job detail form is created that shows the details about the job such as the driver, the van used, actual mileage, and actual weight.

Any request constitutes a "job" in the lingo of the company – a job must include all the pertinent data, including information about the customer, the originating location, the destination location, and the estimated mileage and weight of the load.

Robert gathered a collection of documents during the discovery phase that will help you design the database. You need to be certain that every data item in the existing documents is also represented in the entities in your design. Remember that you will first begin the discovery and planning phases of creating a database for the MovinOn. You will use the documents that Robert provides to develop a database design. After completing the database design, Robert will review it and provide feedback that you will use to create the database.

Complete the following:

1. Robert gave you the form shown in Figure 1, which collects data about employees. In addition to storing the data shown in Figure 1, Robert also needs to identify the warehouse in which the employee works. On paper, design an employee entity and any other necessary entities based on this form. The design for all entities that you create should include attribute names, data types, attribute properties (as necessary), and attribute description. Remember that each entity must have a primary key attribute.

2. The database must manage data about drivers, who are hired on a contract basis. Design a entity that stores information about drivers. The entity should include the same information stored for employees, except for an indication about the warehouse in which the driver works, in addition to storing the following additional information:

    - Drivers are not paid an hourly rate or salary; they are paid based on the number of miles driven for any job. The payments for a job are determined by multiplying the rate per mile by the number of miles for the job.

    - MovinOn rates drivers based on their safety records, successful on-time deliveries, and other factors. The company's rating system uses the values A, B, C, D, and F to rate drivers, with A being the highest rating and F being the lowest rating. (You do not need to worry about how MovinOn assigns ratings to drivers, you only need to store the driver's rating.)

Figure 1: Employees Information Form

mOvinOn Inc.

Employee Information Form

Name: *David Bowers*

Address: *10124 Metropolitan Drive*

City: *Seattle* State: *WA* ZIP: *98117*

Phone: *(206) 246-5132* Cell Phone: *(206) 575-4321*

SSN: *154-00-3785* Date of Birth: *9/12/1958*

(The following information to be filled out by MovinOn human resources manager)

Hire Date: *1/22/1998* Termination Date: _____

Position: *General Manager*

Annual Salary: *$72,000* or Hourly Rate: _____

Date of last personnel review: _____

Notes about this employee:

3. Design an entity that stores data about the trucks and vans owned by MovinOn. Each vehicle has a unique identification number appearing on the vehicle in the format TRK-001 for trucks or VAN-009 for vans. David wants to store the vehicle's license plate number, number of axles, and color.

4. Design an entity that stores data about warehouses using the data shown in Figure 2. The warehouse identification number is the two-letter state abbreviation in which the warehouse is located followed by a dash and then a number.
For example, the warehouse in Wyoming is WY-1.

Figure 2: Data about warehouses

Warehouse.xlsx - Microsoft Excel

Warehouse ID	Address	City	State	Zip	Phone	Climate Controlled	Security Gate
OR-1	#3 Industrial Park Way	Portland	OR	97212	503-551-2432	No	Yes
WA-1	8798 Warehouse Rd	Seattle	WA	98121	206-324-2312	Yes	Yes
WY-1	54781 Hixson Pike	Jackson Hole	WY	83001	307-541-3571	Yes	No

5. Currently, information about storage units is stored in an Excel workbook; a portion of this data is shown in Figure 3. Use this information to help you design an entity that manages data about the storage units.

Figure 3: Data about storage units

	A	B	C	D	E
1	Unit ID	Warehouse ID	Unit Size	Rent	
2	1	OR-1	8 x 8	25.00	
3	1	WA-1	12 x 12	35.00	
4	1	WY-1	12 x 12	45.00	
5	2	OR-1	8 x 12	30.00	
6	2	WA-1	12 x 12	35.00	
7	2	WY-1	12 x 12	45.00	
8	3	OR-1	8 x 8	25.00	
9	3	WA-1	9 x 12	30.00	
10	3	WY-1	12 x 12	45.00	
11	4	OR-1	8 x 12	30.00	
12	4	WA-1	9 x 12	30.00	
13	4	WY-1	12 x 18	70.00	
14	5	OR-1	8 x 8	25.00	
15	5	WA-1	12 x 12	85.00	
16	5	WY-1	12 x 18	70.00	
17	6	OR-1	8 x 12	30.00	
18	6	WA-1	12 x 12	85.00	
19	6	WY-1	12 x 12	45.00	
20	7	OR-1	8 x 10	25.00	
21	7	WA-1	12 x 10	80.00	
22	7	WY-1	12 x 12	85.00	
23	8	OR-1	15 x 15	95.00	
24	8	WA-1	12 x 10	80.00	
25	8	WY-1	12 x 8	35.00	

Storage Units

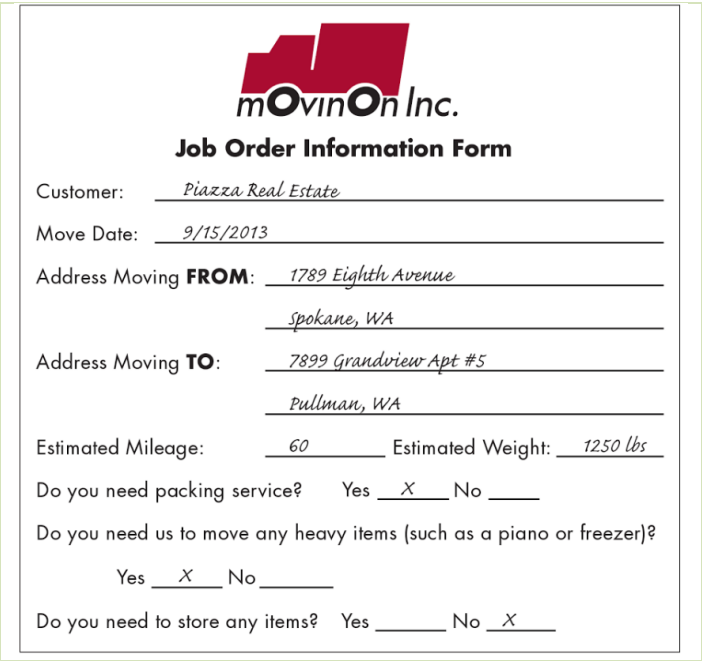
6. You also need to manage data to indicate which customer rents which unit. David wants to store the date the lease started and ended on each unit in each warehouse. For current customers, the ending lease date will be null. Design an entity that manages data about unit rentals.

7. You have learned that data pertaining to moving jobs is accumulated in two steps. When the customer requests a job, the administrative assistant from the warehouse that will perform the services fills out the form shown in Figure 4. This form is considered a “job order”. Design an entity that manages the job order data.

8. David needs to store the following data about customers: company name (for commercial customers only), the job contact’s name, and the address, city, state, zip code, phone number, and balance. Design a customer entity using this information.

9. The administrative assistant uses a scheduling program to manage and assign vehicles and drivers for moving jobs, and then this information is entered into the database. Upon completion of a job, the database must store the details about the job, including the customer, truck or van used, driver, actual mileage, and actual weight. This step is the “job detail”. David wants to store job detail data separately from job order data. Design an entity that manages the job detail information.

Figure 4Job Order Information Form



mOvinOn Inc.

Job Order Information Form

Customer: *Piazza Real Estate*

Move Date: *9/15/2013*

Address Moving **FROM**: *1789 Eighth Avenue*

Spokane, WA

Address Moving **TO**: *7899 Grandview Apt #5*

Pullman, WA

Estimated Mileage: *60* Estimated Weight: *1250 lbs*

Do you need packing service? Yes *X* No ____

Do you need us to move any heavy items (such as a piano or freezer)?

Yes *X* No ____

Do you need to store any items? Yes ____ No *X*

10. For each entity you designed, use a piece of paper or an Excel spreadsheet file to sketch the design so that you can enter five sample records into it. After creating five records, determine whether you need to make any adjustments in your entity designs so that each entity is in the third normal form. If you need to make any changes to your entity designs, do so on your paper and add the necessary documentation to the existing entity designs. You can take a photo of your design and submit it with your work.

11. Apply normalization process using normal forms. Review each entity design to ensure you have created all the necessary fields. Be certain that you have designated a primary key field in each entity and that your primary key field will contain unique values for each record.

12. Keep a copy for yourself as you will need it to develop your database in subsequent assignments.