Department of Electrical and Computer Engineering
University of Puerto Rico
Mayagüez Campus

CIIC 4060/ICOM 5016 – Introduction to Database Systems
Fall 2025

Homework #1:
Database Design
Due Date: November 21, 2025, 11:59 PM

Objectives

1. Understand the use of the ER model and Table diagram for database application design.

Instructions

As a group, you will design a database for a chain of supermarkets that wants to sell products online. You are tasked with developing an **ER and Table Diagrams**. The ER diagram must include cardinalities, relationships, attributes, and use the correct symbols (refer to homework presentations). The Table diagram attributes **must** include their data type.

It is important to make an analysis of attributes and relationships **that are not fully explicit but are necessary for the application to work**.

Specifications and limitations:

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1. The company operates warehouses in multiple cities and countries.

2. Each warehouse has its stock of products.

3. Products can be stored in different sections within a warehouse (e.g., electronics section, furniture section). A single product may be in several sections across several warehouses.

4. The entrance and exit of products in a warehouse are done through traceable transactions.

5. Employees are assigned to specific warehouses.

6. Customers can place orders that are fulfilled from a single or multiple warehouses.

7. Each order includes product quantities, price, and shipment tracking details.

8. Some products require special storage conditions, such as refrigeration or climate control. Ensure that the product is stored in a section that meets its specific requirements.

Queries the Application Must Support

1. Find all products running low on stock (below a threshold).

2. Find all warehouses that received restocked products in the last month.

3. Find all orders shipped to a specific country.

4. Find the total value of inventory stored in each warehouse.

5. Find all employees assigned to a specific warehouse.

6. Check if products requiring special storage conditions are in a warehouse section that fulfills requirements.

7. Find all orders that have not been shipped yet.

8. Find what warehouses are supplying an order.

Deliverables for Homework I

In the Moodle course one member of the group will submit the following:
   1) PDF file with ER and Table Diagram