

## Homework #1

CPSC332 File Structures and Database Systems

Fall 2024, due 09/23/2024

**Please write the last 4 digits of your campus wide ID on the front page of your homework.**

**Problem 1:** You are asked to design a database for a supermarket (selling toys) that satisfies the following requirements:

1. Each employee record has the social security number, name, address, telephone number, and salary.
2. Each category has a unique identifying number, a name, the aisle numbers where items from this category are arranged, and the employee who is in charge of managing that category. Only some employees are in charge of managing categories.
3. Each item is classified into a category. Each item is assigned a unique item number and has a name. One employee is designated to take care of the supply of the item.
4. The same item may have several sub-items. Each sub-item is given a sub-item number that is unique **only within the item**. Each sub-item has a retail price and the quantity of it left in the supermarket. Each sub-item is supplied by a specific manufacturer.
5. Each customer is assigned a unique customer number. The customer record keeps track of each customer's name, address, and telephone number. The name includes first name and last name. The address includes street address, city, state, and zip code. The telephone number includes area code and number.
6. The transaction record includes a customer, the date and time of the transaction, the sub-item in the transaction, and the quantity of the purchase.
7. The information of each manufacturer includes its unique name, address, telephone number, and the name of the person to contact.

Design the database using the Entity-Relationship model.

**Problem 2:** Do Exercise 3.21 in the seventh edition.

Design an ER schema for keeping track of information about votes taken in the U.S. House of Representatives during the current two-year congressional session. The database needs to keep track of each U.S. STATE's Name (e.g., 'Texas', 'New York', 'California') and include the Region of the state (whose domain is {'Northeast', 'Midwest', 'Southeast', 'Southwest', 'West'}). Each CONGRESS\_PERSON in the House of Representatives is described by his or her Name, plus the District represented, the Start\_date when the congressperson was first elected, and the political Party to which he or she belongs (whose domain is {'Republican', 'Democrat', 'Independent', 'Other'}). The database keeps track of each BILL (i.e., proposed law), including the Bill\_name, the Date\_of\_vote on the bill, whether the bill Passed\_or\_failed (whose domain is {'Yes', 'No'}), and the Sponsor (the congressperson(s) who sponsored—that is, proposed—the bill). The database also keeps track of how each congressperson voted on each bill (domain of Vote attribute is {'Yes', 'No', 'Abstain', 'Absent'}). Draw an ER schema diagram for this application. State clearly any assumptions you make.