CS 281 Summer 2021
Project Topics

Carefully study the following project descriptions and try to capture:

- Strong and weak entities,
- Relationships (binary, ternary and specialization (IS-A) relationships), role indicators for an entity in a relationship, mapping cardinalities (1-1, 1-M, M-M) and aggregations (i.e., a relationship as a whole serve as an entity in another relationship),
- Keys.

REMARK: In each of the below scenarios, we try to provide examples of almost *all* of the above E/R elements, so please study these scenarios very carefully!

You are free (and indeed ***expected to***) add more details (and, thus entities/relationships) to the scenarios below. While designing your database, also keep in mind that in the upcoming stages of the project, you have to specify interesting/sophisticated queries over this database.

- Travel Agency: You are going to implement a database system for a travel agency that offers tours around the world. Users of this system are going to be travel agents, tour guides, and customers. For each user, you should store a unique SSN, name, and surname. For travel agents and tour guides, you should also store a monthly salary and bank account number. For customers, you should also store a credit card number and a phone number. For each tour, you should store a unique tour name, total price, and description. Customers can make reservations for tours. Each customer can make multiple reservations and a tour can be reserved by multiple customers. For each hotel, you should store a unique hotel name, daily price, and city. Each tour can include stays at multiple hotels on different dates. You should store the starting and ending dates for a hotel included in a tour. The same hotel can be included in multiple tours. Each tour should include at least one hotel. For each bus, you should store a unique plate number, origin city, and destination city. Each tour can use multiple buses for travels on different dates. The same bus can be used for multiple tours. A tour guide can be assigned to a bus that travels for a tour. In this case, you need to keep the information about which tour guide is assigned to which bus for which tour. The same tour guide can be assigned multiple times, but to a bus that travels for a tour at most one tour guide can be assigned. Travel agents are given flyers for advertising the company. Each flyer is identified by the combination of its title and the SSN of the travel agent it belongs to. Each flyer also includes a print date and description.

    - Log in as a customer. List all tours with their total prices. Filter tours by name. Choose a tour, display the hotels and buses included in the chosen tour. Make a reservation for the chosen tour for this customer.
    - Log in as a travel agent. Create a new tour. List all hotels and buses. Assign multiple hotels and buses to this new tour, display its total price. List all tour guides and assign a tour guide to a selected bus for this tour. List all flyers of this travel agent.
    - Log in as a tour guide. List all assignments of this tour guide (buses that travel for tours), choose one of them, and show the customers that made a reservation for the tour that this bus travel is assigned to. Update a selected customer's phone number.

- Online Market: You are going to implement a database system for an online market that delivers products to houses. Users of this system are going to be stockers, deliverers, and customers. For each user, you should store a unique SSN, name, and surname. For customers, you should also store their address and phone number. For each product, you should store a unique product number, product name, description, unit price, and stock amount. For each brand, you should store a unique brand name and a description. Each product should belong to exactly one brand and one brand can have multiple products. Customers can create carts for shopping. Each cart should belong to exactly one customer, and a customer can have zero or more carts. For each cart, you should store a unique cart id, date of creation, delivery status ("new", "paid", "on delivery", "completed"), and total price. In each cart, there could be many products. You should also store the amount of product that is in the cart. The same product can be in multiple carts. Carts with paid status are assigned to deliverers for delivery. Each deliverer can be assigned to multiple carts but a cart can be assigned to only one deliverer. For each truck, you should store a unique plate number and capacity in kilograms. Sometimes, deliverers can use trucks for carrying a cart. In this case, you should keep the information about which truck is assigned to the delivery of which cart by which deliverer. Stockers can be assigned to one-time jobs in different warehouses. These jobs are identified by the combination of the name of the warehouse, date of the assignment, and the SSN of the assigned stocker. For each one-time job, you should also store a description.

    - Log in as a customer. List all products. Filter products by name. Add multiple products to the current cart with different amounts. Remove products from the cart. Show the total price of the cart. Order the current cart by setting its status to paid.
    - Log in as a deliverer. List all paid carts. Choose one cart to assign to this deliverer. Show the carts assigned to this deliverer, assign a truck for the delivery of the chosen cart for this deliverer. Choose a cart, show its delivery address, mark it as completed.
    - Log in as a stocker. List all brands. Choose a brand and list all products of that brand. Choose a product, update its stock amount and price. Create a new product for the chosen brand. List all one-time jobs of this stocker.