Homework #1

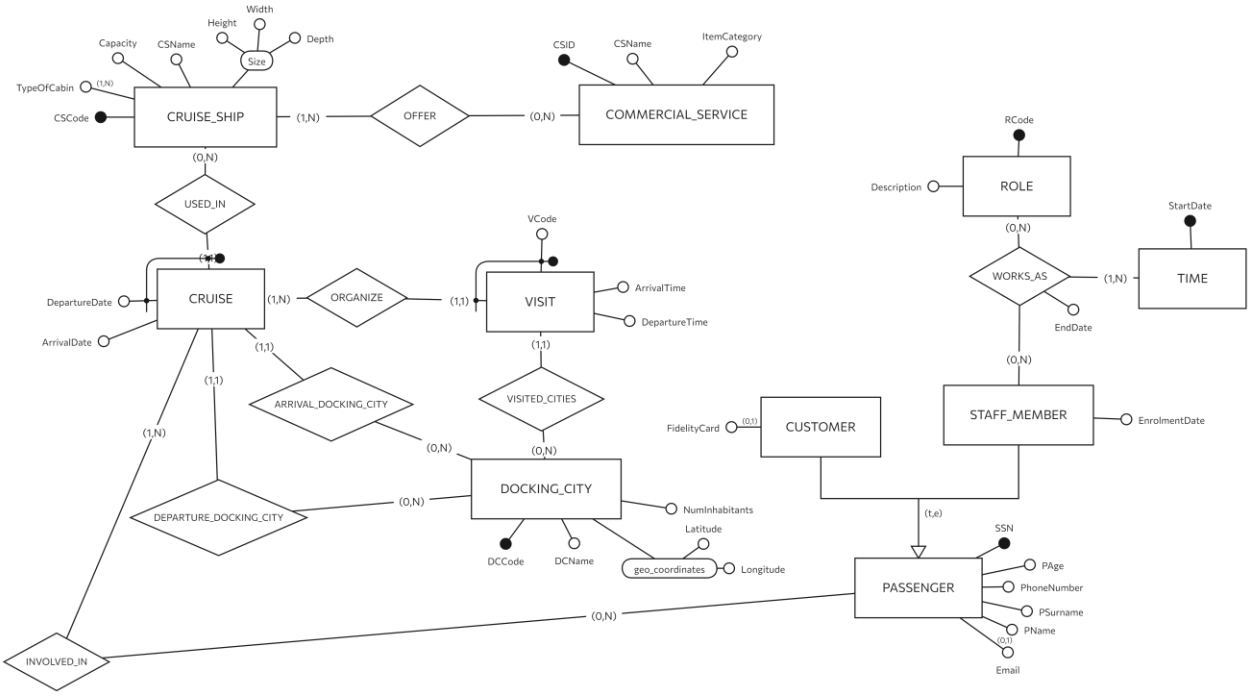
Exercise on database design

A company that owns cruise ships wants to design a database for managing scheduled cruises and related services offered by its ships.

- Each cruise ship of the company is identified by the ship code and characterized by name, capacity (number of passengers who can be accommodated), and size (height, width, and depth). Each cruise ship is also characterized by the list of types of cabins available.
- Every cruise ship offers on-board commercial services, which are available to passengers to spend their free time. Every commercial service is characterized by name, category of sold items, and identification number.
- Each cruise organized by the company is identified by means of the cruise ship used and the departure date. Each cruise is also characterized by the leaving docking city, the arrival docking city, and the arrival date. The docking cities, identified by an alphanumeric code, are characterized by name, geographical coordinates, and number of inhabitants.
- The list of passengers participating in each cruise is also recorded. Passengers are characterized by social security number, name, surname, age, phone number, and email address (if available). Passengers can be either customers or staff members. For the customers, the fidelity card number (if available) is recorded, while each staff member is characterized by the enrolment date.
- Roles are assigned to some staff members. Each role, identified by a code, is characterized by a description. For each staff member, it is required to keep track of the periods (described by starting and ending dates) in which each role has been assigned. Assume that multiple roles can be assigned in the same period to each staff member, and that the same role can be assigned in different periods to each staff member.
- Each cruise offers to passengers the chance to make daily visits in the docking cities. Visits are identified by a code unique for each cruise and are characterized by the visited docking city, date, arrival and leaving times at the harbor.

1. Describe the conceptual schema of a database for the above application by means of an ER diagram.
2. Derive a normalized relational logical schema for the same database.

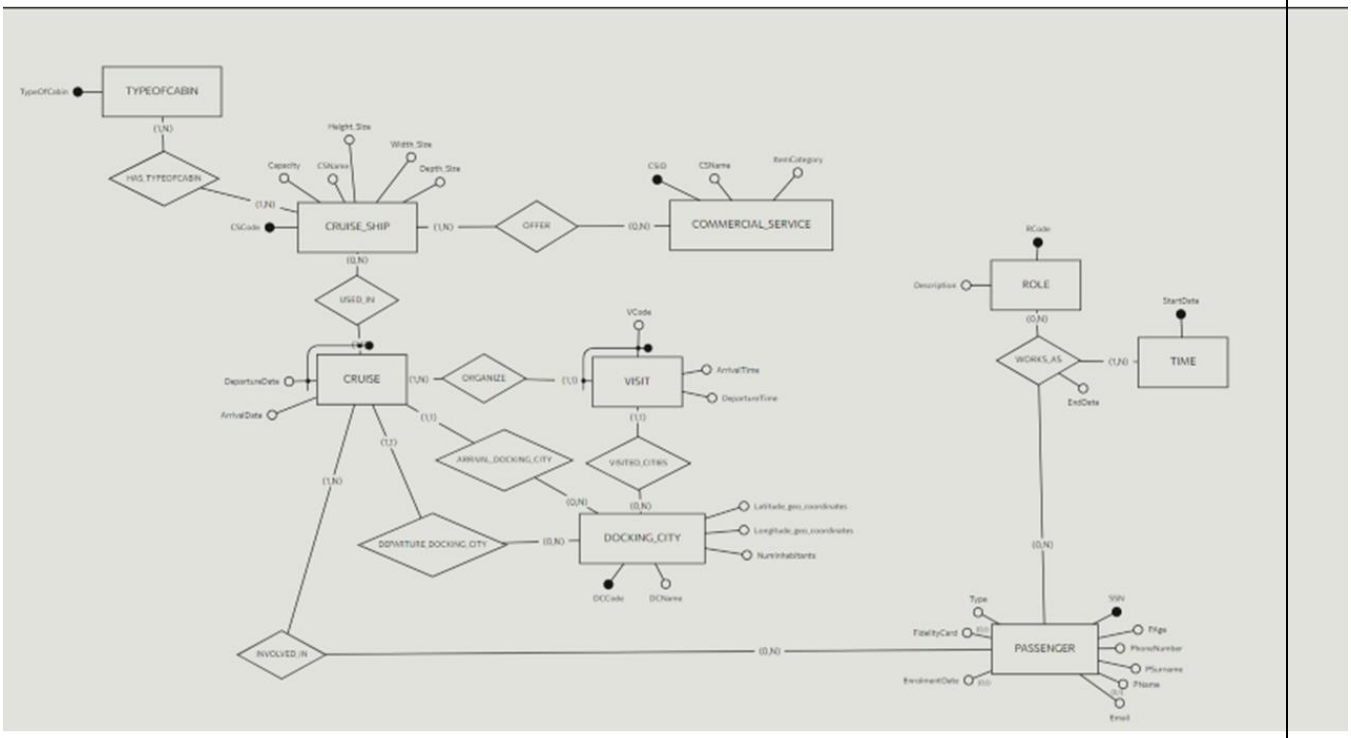
ER Diagram



Schema logico relazionale

CRUISE_SHIP (CSCode, Capacity, CSName, Height, Width, Depth)
CABIN_IN_CRUISE_SHIP (CSCode, TypeOfCabin)
COMMERCIAL_SERVICE (CSID, CSName, ItemCategory)
OFFER (CSCode, CSID)
DOCKING_CITY (DCCode, DCName, NumInhabitans, Latitude, Longitude)
CRUISE (CSCode, DepartureDate, ArrivalDate, DCCodeDeparture, DCCodeArrival)
VISIT (CSCode, DepartureDate, VCode, DCCode)
PASSENGER (SSN, PName, PSurname, PAge, PhoneNumber, Email*, TypeOfPassenger, FidelityCard*, EnrolmentDate*)
TIME (StartDate)
ROLE (RCode, Description)
WORK_AS (SSN_Staff_Member, RCode, StartDate, EndDate)
INVOLVED_IN (CSCode, DepartureDate, SSN)

ER Restructured



Logical schema