Northeastern University

DAMG6210 - Data Management and Database Design

Fall '21 - **TEAM 7**

Project Title: A database design to keep track of the **Campus Housing System**.

Purpose:

The purpose of this database design is to help the university to **manage and maintain** the on-campus houses for the students. The design takes into account the student assignment to dorms, provides proctors to the dorm, and handles emergencies.

Database Design Decision:

- When a student enrolls in university and opts for on-campus housing, the student will be automatically assigned a dorm room. Dorm mappings are stored in the **Resident** table.
- The student can access the assigned dorm by swiping their ID cards. The login data is stored in the **Swipe Log** table.
- Students can bring guests with them and they need to log the guests in before entering the dorm. Guest details will be stored in the **Guest** table.
- Dorms will have some utilities which can be accessed by the residents. Utility details will be stored in the **Utility** table.
- Supervisors will manage the Shift assignments for the dorms and proctors. The assigned shift for proctors and dorm details are stored in the **Shifts** table.
- In emergencies, a case will be raised for the respective dorm. The details will be stored in the **Case** table.
- For each case raised, one or more police will be assigned to handle the situation. The details of this mapping will be stored in the Police **Case Mapping** table.

Facts:

- Dorms are supervised by Proctors.
- The Police Department manages Residents, Dorms, Proctors, and Admins in case of emergencies.
- Residents' entries are handled by Proctors.
- Proctors manage Guests in Dormitories.
- The student won't be admitted to a dorm if the capacity of the respective dorm exceeds.
- Students can bring in multiple guests.

Assumptions:

1. Students can have access to only one assigned dorm.
2. Multiple proctors can be assigned to a single dorm.
3. One resident is allocated to one dorm only, no switching of the dorm is allowed.
4. Supervisors can issue/assign multiple shifts to a proctor.
5. Not all students are residents.
6. Students are not proctors and vice-versa.

7. Shift types, Utility types and Case types come from a predefined set of data respectively.

Database Identification:

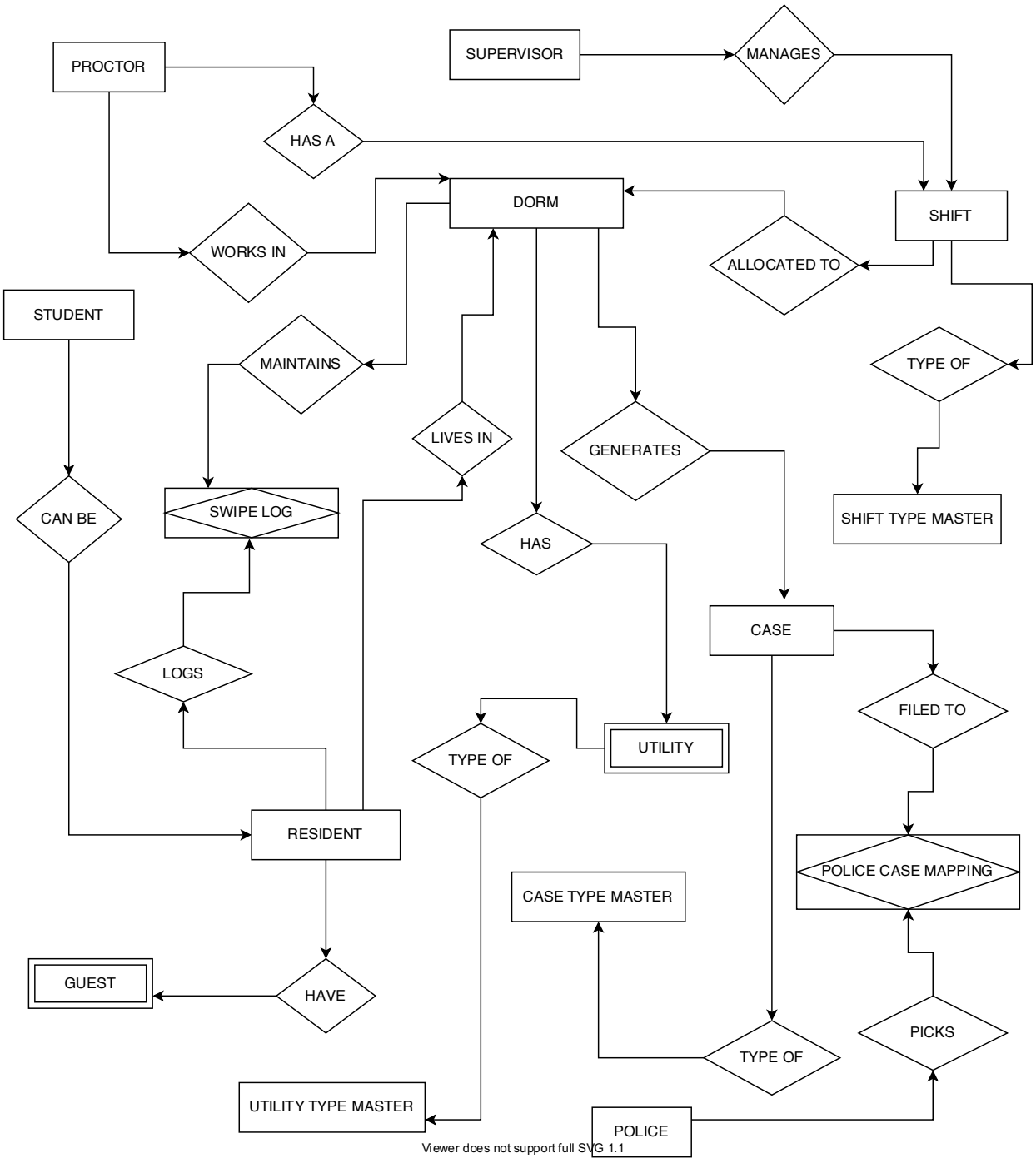
Following are the Main Entities -

Dorms, Proctors, Supervisor, Police, and Residents.

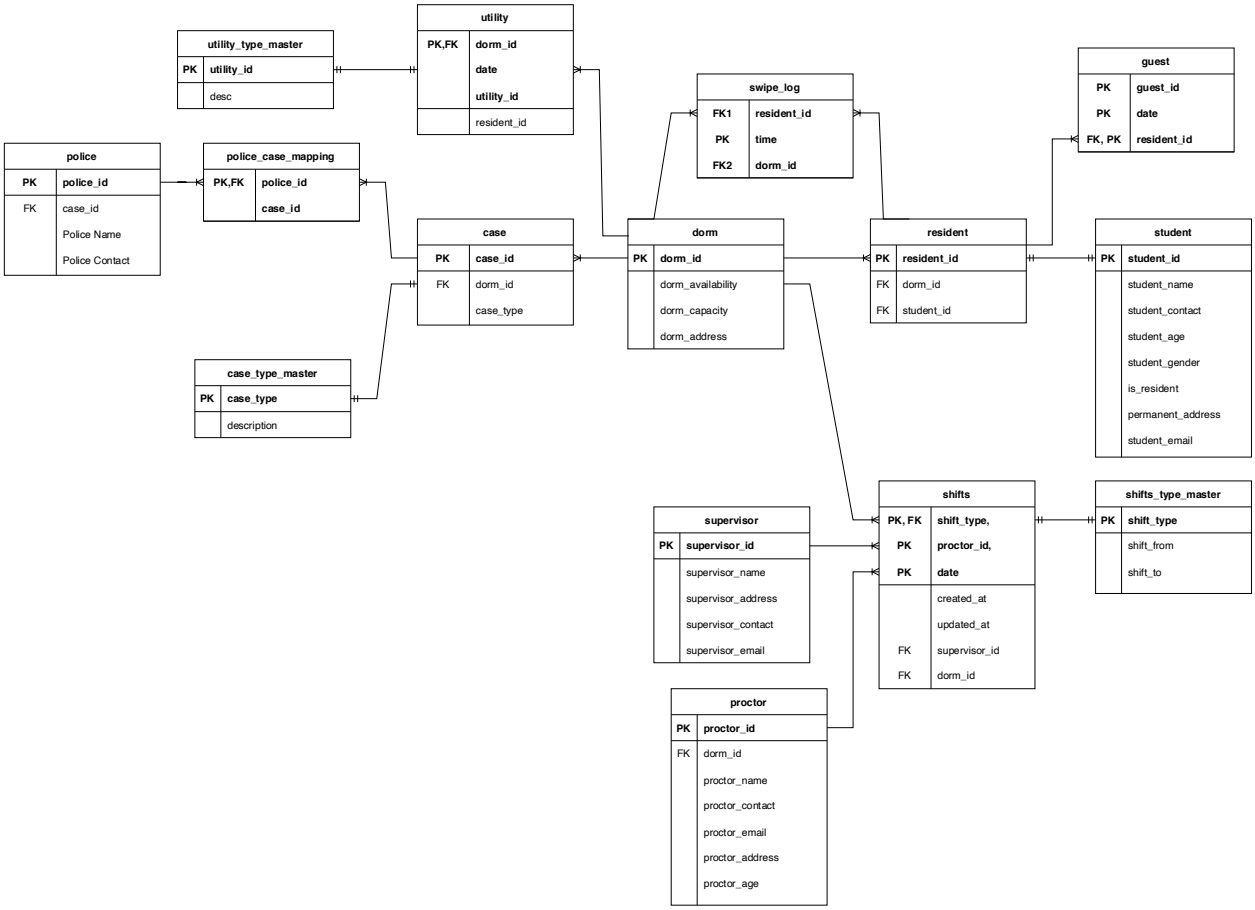
Moreover, the above entities defined few major attributes which are the crucial ones for working of the On-Campus Housing Model, they are -

Entity Name	Attributes	Description/Meaning
Proctor	proctor_id	Proctor ID is a unique identifier assigned to each proctor.
Dorm	dorm_id	Dorm ID is a unique identifier assigned to each dorm.
Supervisor	supervisor_id	Supervisor ID is a unique identifier assigned to each supervisor.
Police	police_id	Police ID is a unique identifier assigned to each police.
Resident	resident_id	Resident ID is a unique identifier assigned to each resident.
Utility	utility_id	Utility ID is a unique identifier assigned to each utility.
Shift	shift_type	Shift type is used to uniquely identify selected shifts. For example shift_type = M01 means morning shift 1.
Swipe_Log	resident_id + dorm_id + time	All three attributes i.e resident_id, dorm_id, and time together are used to uniquely identify residents swipe in. This entity is used to maintain the log of each resident.

Conceptual Diagram:



Logical Diagram:



Physical Diagram: