1. Consider the following schema and set of functional dependencies:

Class ( course\_id, title, dept\_name, credits, sec\_id, semester, year, building, room\_no,

capacity, time\_slot\_id)

F={ course\_id -> title, dept\_name, credits,

building, room\_no -> capacity

course\_id, sec\_id, semester, year -> building, room\_no, time\_slot\_id

}

The information you provided describes a database schema for a university course management system. Let's break it down:

Schema:

Class: This is the name of the table that stores information about courses.

Attributes:

course\_id: Unique identifier for the course.

title: Name of the course.

dept\_name: Department offering the course.

credits: Number of credits the course awards.

sec\_id: Section identifier for a specific offering of the course (e.g., Fall 2023 - SEC 001).

semester: Semester the course is offered (e.g., Fall, Spring, Summer).

year: Year the course is offered.

building: Building where the course is held.

room\_no: Room number where the course is held.

capacity: Maximum number of students allowed in the class.

time\_slot\_id: Unique identifier for the time slot of the course (e.g., MWF 10:00 AM).

Functional Dependencies (FDs):

This schema seems to represent information about classes offered by an educational institution. Here are some explanations and observations based on the given functional dependencies (FDs):

course\_id -> title, dept\_name, credits: This FD implies that each course is uniquely identified by its course\_id, and for each course, there is only one title, department name, and credit value associated with it.

building, room\_no -> capacity: This FD suggests that for each combination of building and room number, there is only one capacity value. It means that the capacity of a room in a building remains constant regardless of any other attribute.

course\_id, sec\_id, semester, year -> building, room\_no, time\_slot\_id: This FD indicates that for a given combination of course\_id, section\_id, semester, and year, there is a unique room allocated in a building, along with a time slot. It suggests that each class section is assigned a specific room and time slot for a particular semester and year.

Given these FDs, it's important to note the following:

The FDs help maintain data integrity by ensuring that certain attributes are functionally dependent on others.

They can guide the design and normalization process to minimize redundancy and anomalies in the database.

The FDs also give insights into how the data should be structured and how relationships between attributes are defined.