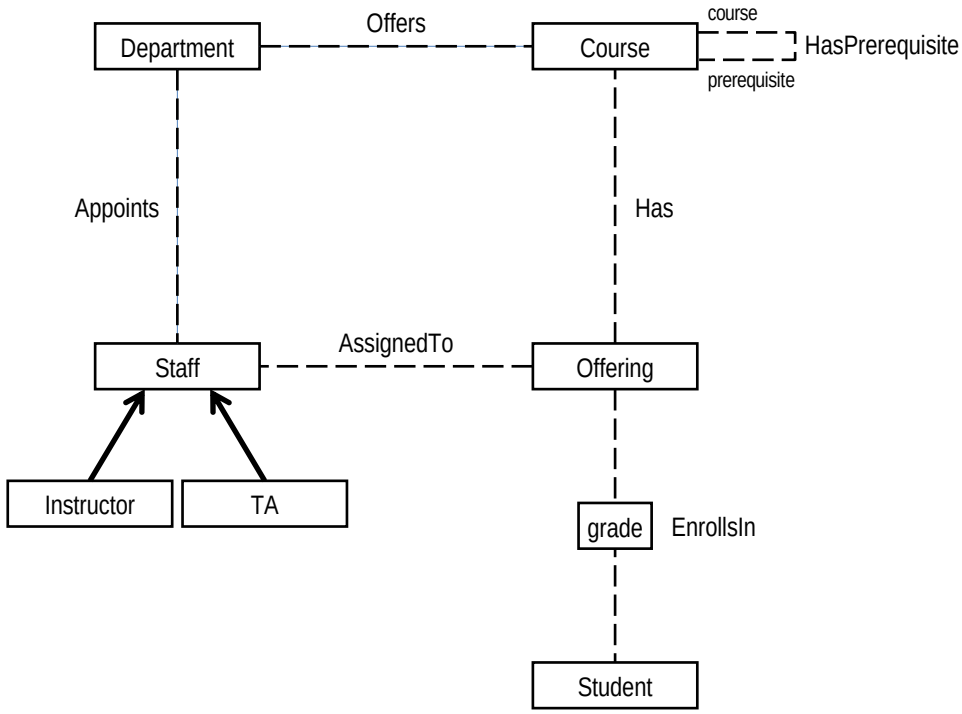
COMP 3311: Database Management Systems

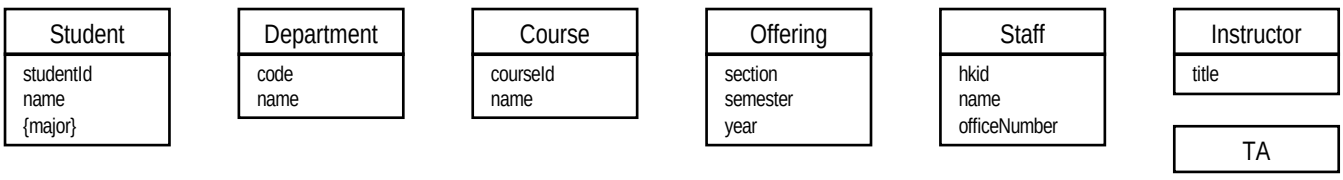
Lecture 3 Exercises
Entity-Relationship (E-R) Model and Database Design

Exercise 1: We want to record information about students, departments, courses and course teaching teams.

- For each student we store the student id, name and majors.
- For each department we store a unique code and name.
- For each course we store a unique course id, name, department and prerequisites.
- For each offering of a course we store the section, semester and year.
- Each student must enroll in one to five course offerings.
- Each course offering can enroll zero to sixty students.
- For each course offering that a student takes we store the grade.
- Each course offering's teaching team has one or more staff, who is either an instructor or a TA.
- For each staff assigned to a course offering's teaching team we store the hkid, name, department and office number.
- For each instructor we store their academic title (i.e., professor, lecturer, etc.).

For the university application E-R diagram shown below, identify keys and discriminators of entities, weak entities and their identifying relationship(s) and show relationship cardinality and participation constraints.





Name: (1) _____/_____ **Student#:** (1) _____ **Date:** _____
Family/Given (PRINT) Given/First (PRINT)

Name: (2) _____/_____ **Student#:** (2) _____
Family/Given (PRINT) Given/First (PRINT)

NOTE: You are highly encouraged to do this exercise with a partner.

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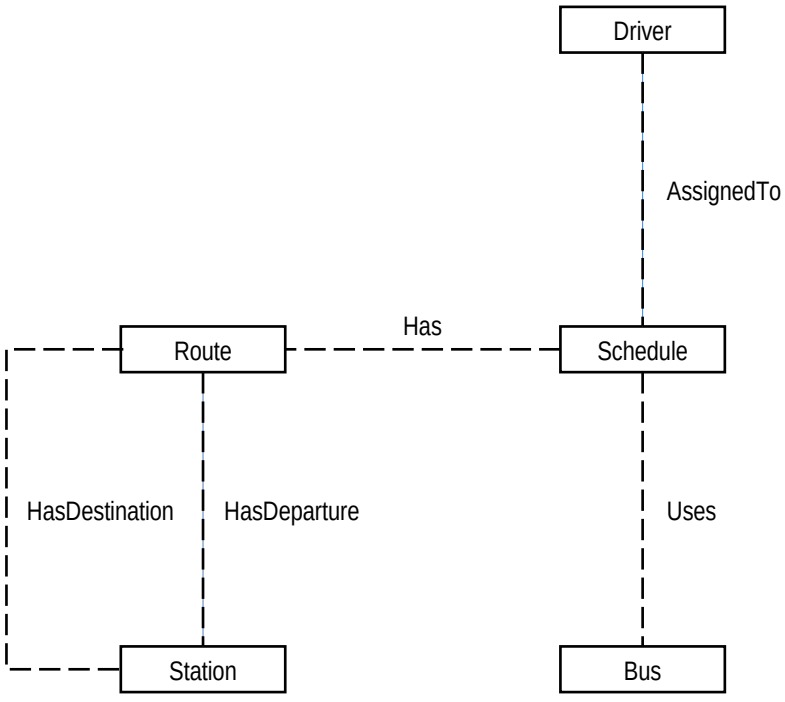
Exercise 2: We want to keep track of bus routes and schedules for a bus company.

- Each bus route has a unique route number, a departure station and a destination station.
- For each bus route, there is a schedule, which records the departure times of buses.
- For each departure time of each route, a driver and a bus can be assigned. However, information about the driver or the bus may sometimes be missing.
- A driver has a unique employee id, a name and a phone number.
- A bus is identified by its license number and has a maximum seating capacity.

For the bus company application E-R diagram shown below, identify keys and discriminators of entities, weak entities and their identifying relationship(s) and show relationship cardinality and participation constraint.



Route	Schedule	Driver	Bus	Station
routeNo	departureTime	empId name phoneNo	licenseNo maxSeating	name

You must upload this completed exercise sheet to Canvas by **2:30 p.m. today.**