

## ER diagram to schema

23 September 2023 21:37

• After all the redundant attribute removal, the university database would be as follows:

• Entities & attributes:

- **Classroom** (**building**, room number, capacity).
- **Department** (**dept name**, building, budget).
- **Course** (**course id**, title, credits).
- **Instructor** (**ID**, name, salary).
- **Section** (sec\_id, semester, year). □ weak entity with all attributes as descriptive
- **Student** (**ID**, name, tot cred).
- **Time slot** (**time slot id**, {(day, start time, end time)}).

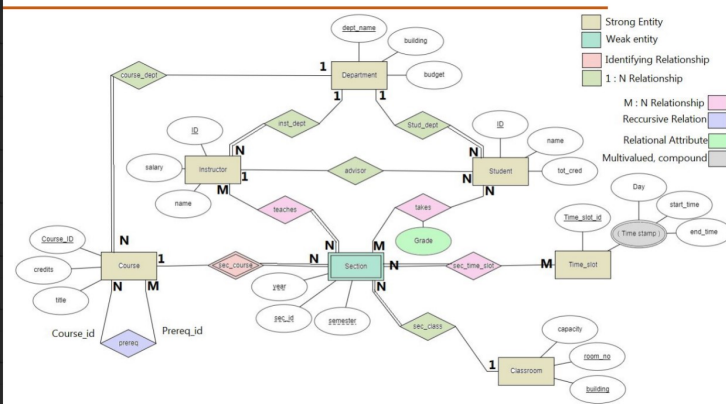
• Relationships:

- **Inst\_dept**: relating instructors with departments.
- **Stud\_dept**: relating students with departments.
- **Teaches**: relating instructors with sections.
- **Takes**: relating students with sections, with a descriptive attribute grade.
- **Course\_dept**: relating courses with departments.
- **Sec\_course**: relating sections with courses. □ identifying relationship
- **Sec\_class**: relating sections with classrooms.
- **Sec\_time\_slot**: relating sections with time slots.
- **Advisor**: relating students with instructors.
- **Prereq**: relating courses with prerequisite courses.

Constraints:

- Each instructor must have exactly one associated department.
- Every course must be in some department
- Every student must be majoring in some department
- Every course and every student can be related to only one department, not several
- each student has at most one advisor

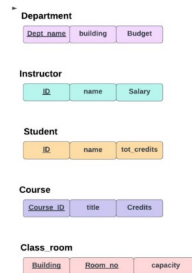
### University Database



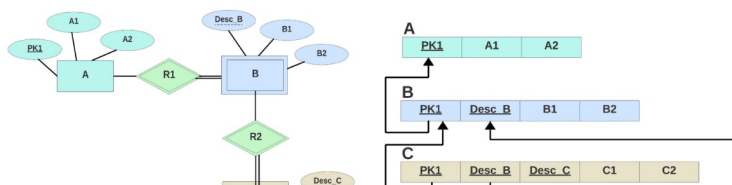
### Representation of Strong Entity Sets

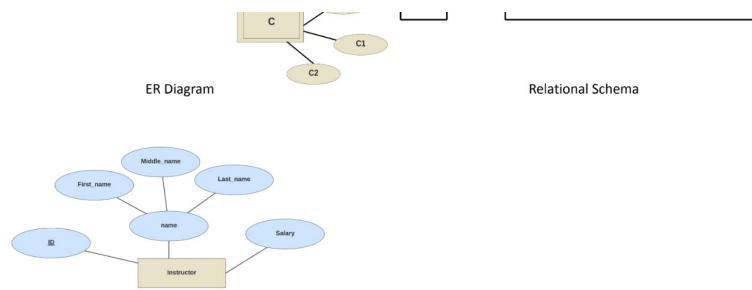
• Similarly converting all the strong entities with simple attributes in the university DB, we get the following schemas:

- **Classroom**(**building**, room number, capacity)
- **Department**(**dept name**, building, budget)
- **Course**(**course id**, title, credits)
- **Instructor**(**ID**, name, salary)
- **Student**(**ID**, name, tot cred)



• In general, for the given ER diagram, the relational schema is as given:





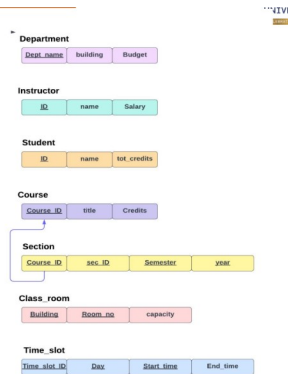
Composite attributes

- The schema:

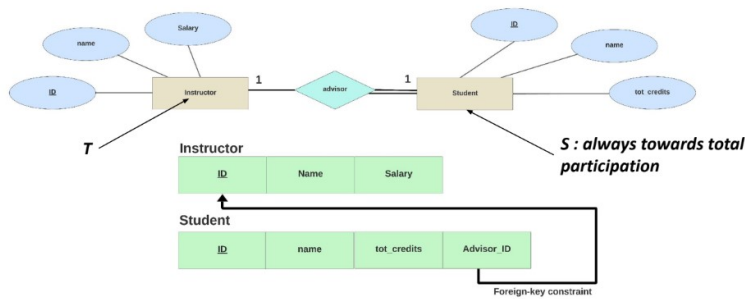
**Instructor**(ID, name, Date\_of\_Birth, Salary)

- Derived attributes eliminated from relational schema

- After incorporating the complex attributes the university database would look like

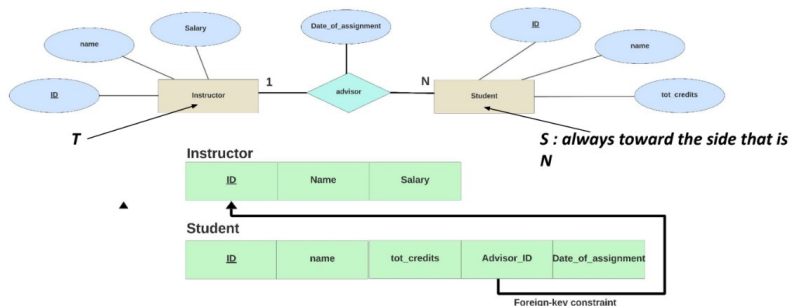


- Consider for this situation, the advisor relation to be one-to-one or 1:1 (Foreign key approach)



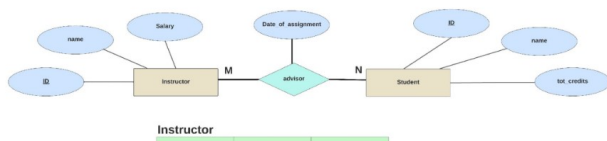
Added to total participation

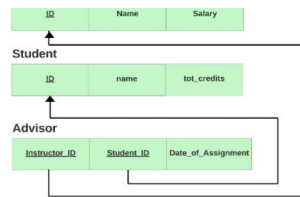
- Consider for this situation, the advisor relation to be one-to-many or 1:N



Added to many side

Consider for this situation, the advisor relation to be many-to-many or M:N





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- Make new entity
  - Primary keys should be pk of the connecting entities