

CSE2DBF – CSE4DBF

EER Example

Reading:

Elmasri and Navathe, “Fundamentals of Database Systems, Chapters 1 & 2”, Pearson, 2016.

Ebook: <https://ebookcentral-proquest-com.ez.library.latrobe.edu.au/lib/latrobe/detail.action?docID=5573709>

EER Diagram and Transformation Example

The university keeps information of Lecturers who work for them. The property of Lecturer includes the staff number, name and title. Information of students is also maintained. Students can be grouped into undergraduate (UG), coursework postgraduate (CPG), and research postgraduate (RPG). For UG, the degree major is recorded. For CPG the previous degrees are required. For all students, their student ID and personal details are required. A student can also be a research assistant (RA). For research assistant, their level and time percentage of research work are recorded.

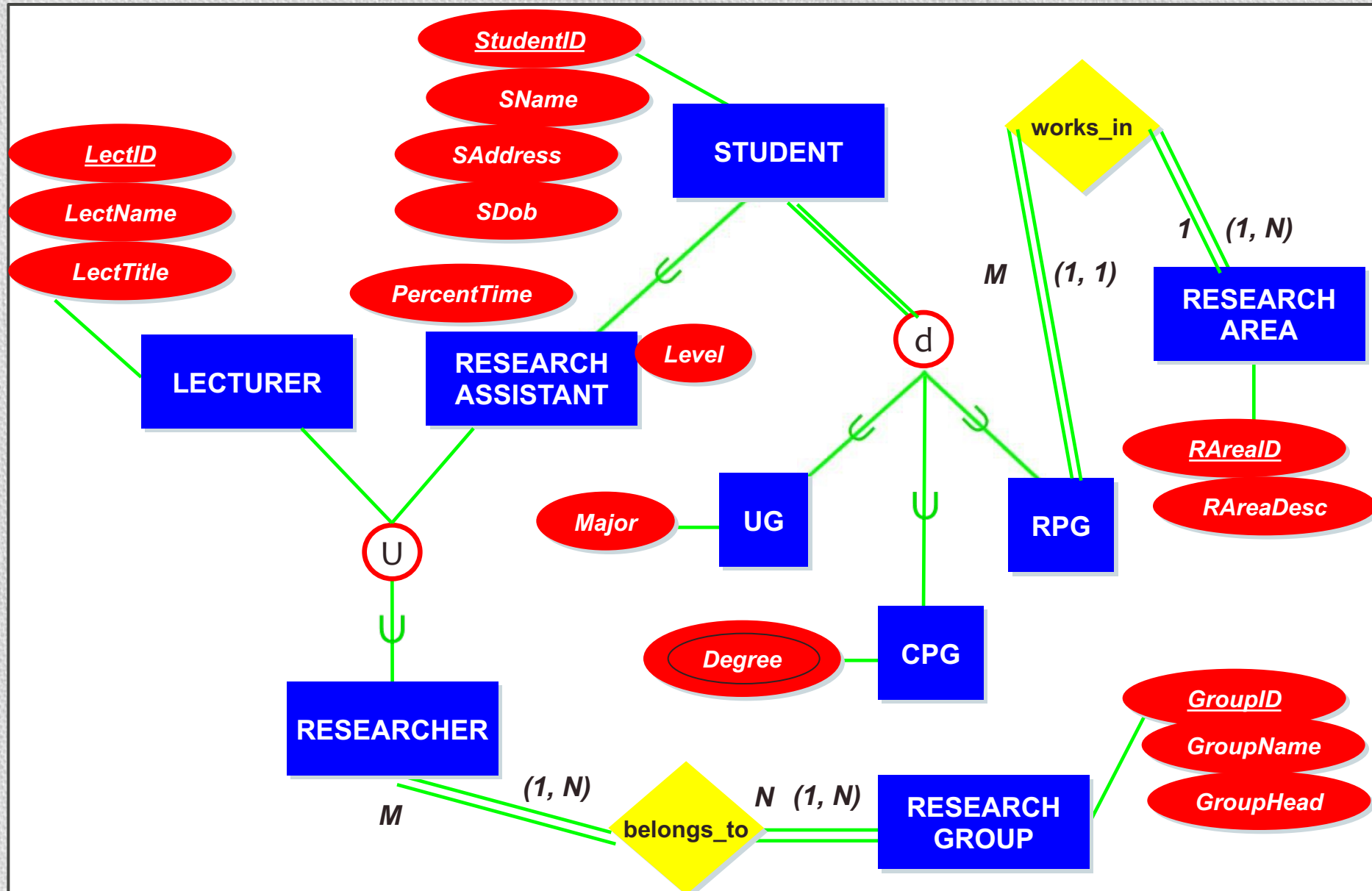
RPG can work in a specific research area. The information of research area is stored, which includes the research area id and description.

The university also maintains information about research groups that exist in campus. The research group ID, name and head/manager is part of the research group properties. Each research group has members of researchers and each researcher can be part of multiple research group.

To be categorised as researcher, someone has to be either a Lecturer or a RA. However, not all Lecturers are researchers. The same is applicable to RAs.

Develop an **EER model** for the above problem definition. Any assumptions should also be stated. Following the EER model, transform the diagram into a set of final relations using the 9 transformation steps.

EER Diagram and Transformation Example



EER Case

- **STEP 1:**

LECTURER (LectID, LectName, LectTitle)

STUDENT (StudentID, SName, SAddress, SDob)

RESEARCHAREA(RAreaID, RAreaDesc)

RESEARCHGROUP(GroupID, GroupName, GroupHead)

- **STEP 2:** no weak entity
- **STEP 3:** no 1 To 1 relationship
- **STEP 4:** no 1 To N relationship
- **STEP 5:** no M To N relationship
- **STEP 6:** no multivalued attributes
- **STEP 7:** no ternary relationship

EER Case

- **STEP 8A:**

UG (StudentID, Major)

CPG (StudentID)

RPG (StudentID)

RESEARCHASSISTANT (StudentID, Level, PercentTime)

- **STEP 2:** no weak entity
- **STEP 3:** no 1 To 1 relationship
- **STEP 4:** 1 To N relationship
 - The RPG relation is modified:
RPG (StudentID, RAreaID)
- **STEP 5:** no M To N relationship
- **STEP 6:** multivalued attributes
 - The CPG relation is modified:
CPG (StudentID, Degree)
- **STEP 7:** no ternary relationship

EER Case

- **STEP 9:**

RESEARCHER (ResearcherID)

LECTURER (LectID, LectName, LectTitle, *ResearcherID*)

RESEARCHASSISTANT (*StudentID*, Level, PercentTime, *ResearcherID*)

- **STEP 2:** no weak entity
- **STEP 3:** no 1 To 1 relationship
- **STEP 4:** no 1 To N relationship
- **STEP 5:** M To N relationship

→ BELONGS_TO relation is created:
BELONGS_TO (*ResearcherID*, *GroupID*)

- **STEP 6:** no multivalued attributes
- **STEP 7:** no ternary relationship

EER Case

Final Tables:

STUDENT (StudentID, SName, SAddress, SDob)
RESEARCHAREA(RArealID, RAreaDesc)
RESEARCHGROUP(GroupID, GroupName, GroupHead)

Step 1

UG (StudentID, Major)
RPG (StudentID, *RArealID*)
CPG (StudentID, Degree)

Step 8

RESEARCHER (ResearcherID)
LECTURER (LectID, LectName, LectTitle, *ResearcherID*)
RESEARCHASSISTANT (StudentID, Level, PercentTime, *ResearcherID*)
BELONGS_TO (ResearcherID, GroupID)

Step 9

Next Lecture

Normalization

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