

Foreign Key:  
 - Is not a Key  
 - The Primary Key of the reference Table

Detailed diagram showing data in the **Department** and **Professors** tables. The **Department** table has columns **ID**, **Name**, and **...**. The **Professors** table has columns **ID**, **name**, **Dep-ID**, and **...**. A purple circle highlights the value **3** in the **ID** column of the **Department** table. A purple arrow points from this circle to the value **3** in the **Dep-ID** column of the **Professors** table. The **Professors** table contains the following data:

ID	name	Dep-ID	...
1	X	3	...
4	Y	2	...
3	Z	3	...
2	A	2	...
5	B	1	...
6	C	3	...

# ERD to Database Schema

## 1. Every Entity Translates to a Table

- Single attributes → Columns
- Composite attribute → Flat out to the atomic Sub-attribute
  - Name
    - Fname
    - lastname
- Derived attributes → Ignore (we don't store them)
- Multivalued attributes → New Tables

Professor?
<u>ID</u>
Name
...

Department
<u>ID</u>
Name
{ Phone Nos }

Professor (ID, name, Dep-ID)

Department (ID, name, DepHead-ID)

PhoneNo (Number, Dep-ID)

Student (ID, Name, ...)

Student\_Dep (StuID, DepID)

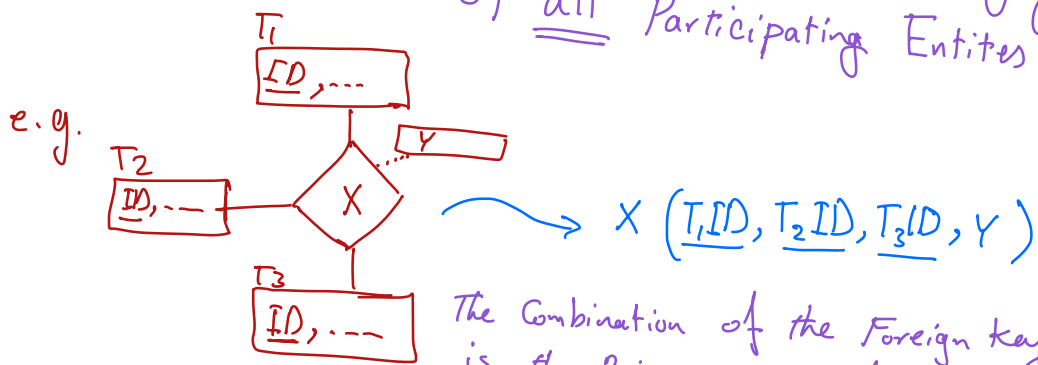
Course (ID, Name, Dep-ID, ...)

Course\_Section (CRN, Course-ID, ...)

Rule 1: For  $\begin{bmatrix} 1\text{-many} \\ \text{many-1} \end{bmatrix}$  relationships:  
 ↳ Add the Primary Key of the 1-Side as a foreign key to the many-side

Rule 2: For 1-1 relationships: Add " " " " the optional Participation  
 ↳ e.g.,: Add deptHead-ID to the Table Department  
 as " " " " to the other side

Rule 3: For many-many relationships  
 Add a new Table,  
 that includes the Primary Key  
 of all Participating Entities



The Combination of the Foreign keys  
 is the Primary Key of the  
 new Table X

For

Weak Entities, add a new Table