

**IT 775**  
**Database Technology**  
**Relational Database (RD)**  
**Modeling**

**Constraints**

# RELATIONAL DATABASE CONSTRAINTS

- **Relational database constraints** - rules that a relational database has to satisfy in order to be valid
  - **Implicit constraints**
    - The implicit relational database model rules that a relational database must satisfy in order to be valid
  - **User-defined constraints**
    - Database constraints that are added by the database designer

# RELATIONAL DATABASE CONSTRAINTS

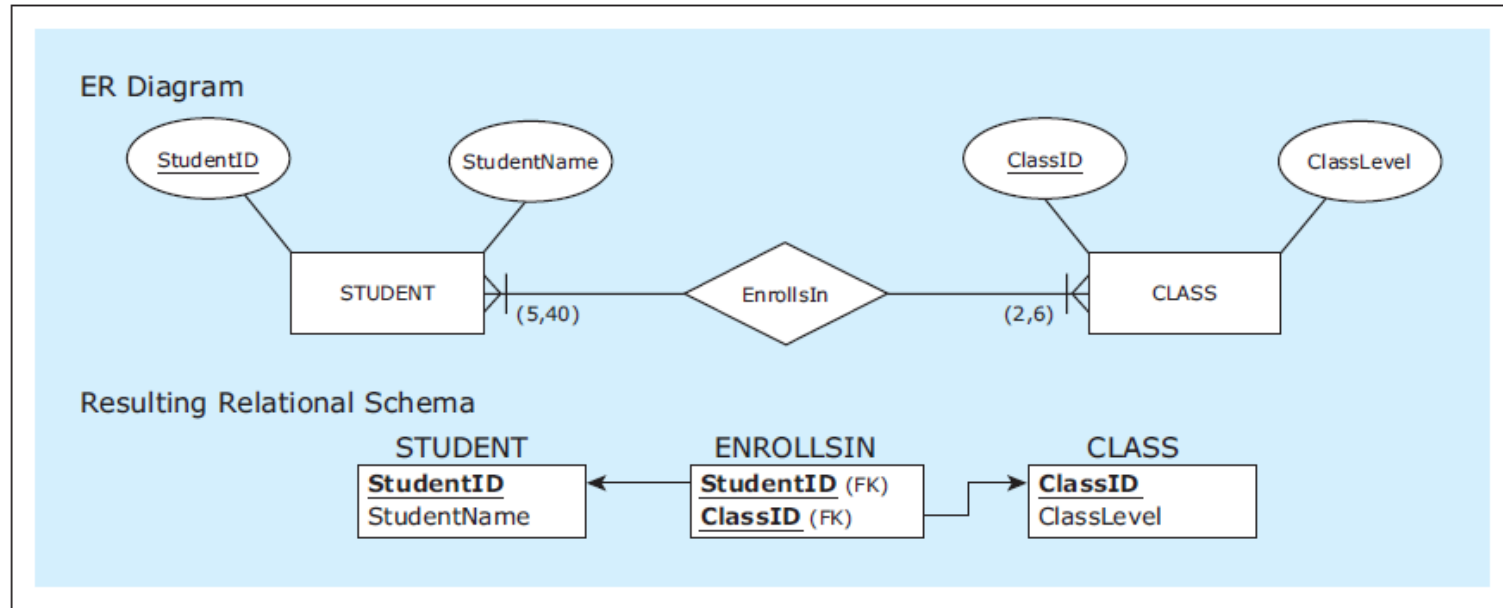
- **Implicit constraints**
  - Each relation in a relational schema must have a different name
  - Each relation must satisfy the following conditions:
    - Each column must have a different name
    - Each row must be unique
    - In each row, each value in each column must be single valued
    - **Domain constraint** - all values in each column must be from the same predefined domain
    - The order of columns is irrelevant
    - The order of rows is irrelevant
  - **Primary key constraint** - each relation must have a primary key, which is a column (or a set of columns) whose value is unique for each row
  - **Entity integrity constraint**
  - **Referential integrity constraint**

# RELATIONAL DATABASE CONSTRAINTS

- **User-defined constraints**
  - Added by the database designers

# RELATIONAL DATABASE CONSTRAINTS

Specific  
minimum  
and  
maximum  
cardinalities



Sample data  
records for the  
mapped  
relations

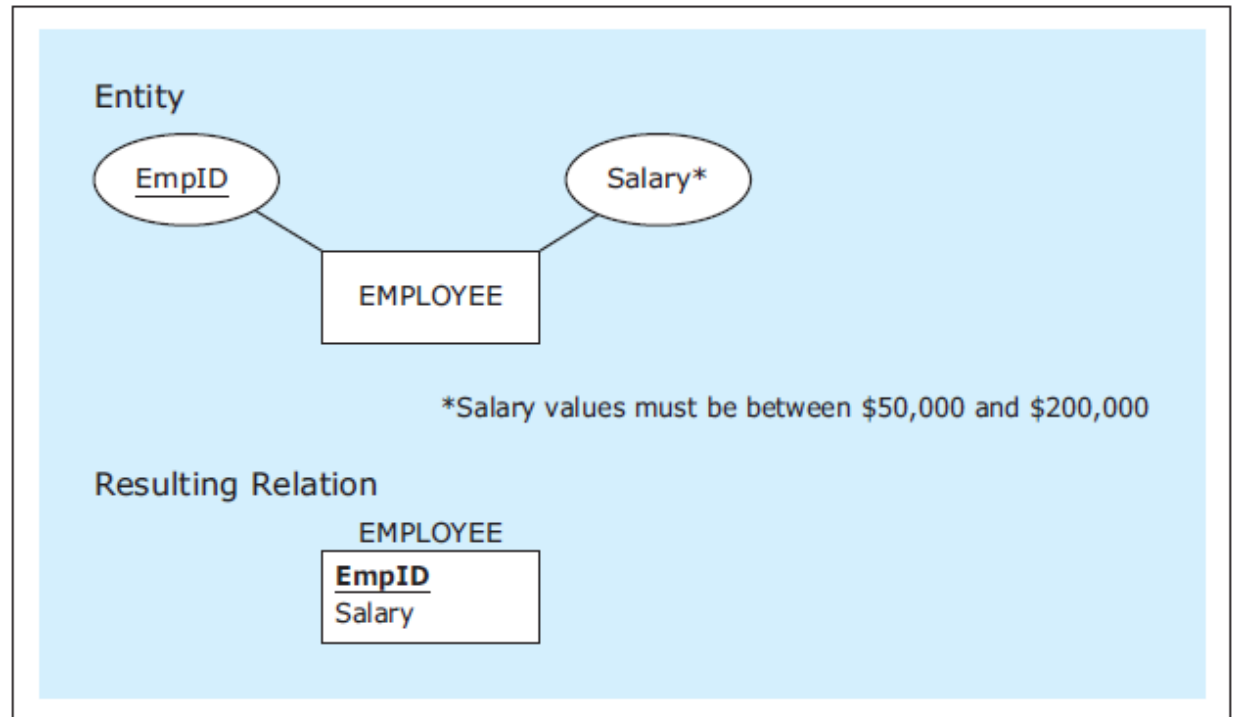
STUDENT		ENROLLSIN	
<u>StudentID</u>	SName	<u>StudentID</u>	<u>ClassID</u>
1111	Robin	1111	IS346
2222	Pat	2222	IS346
3333	Jami	3333	IS346
4444	Zach	4444	IS346
5555	Louie	5555	IS346
CLASS		1111	IS401
<u>ClassID</u>	ClassLevel	2222	IS401
IS346	Junior	3333	IS401
IS401	Senior	4444	IS401
		2222	IS401

# RELATIONAL DATABASE CONSTRAINTS

- **Business rules**
  - User defined constraints that specify restrictions on databases that are not a part of the standard notation for creating ER diagrams

# RELATIONAL DATABASE CONSTRAINTS

Business rule for salary amounts

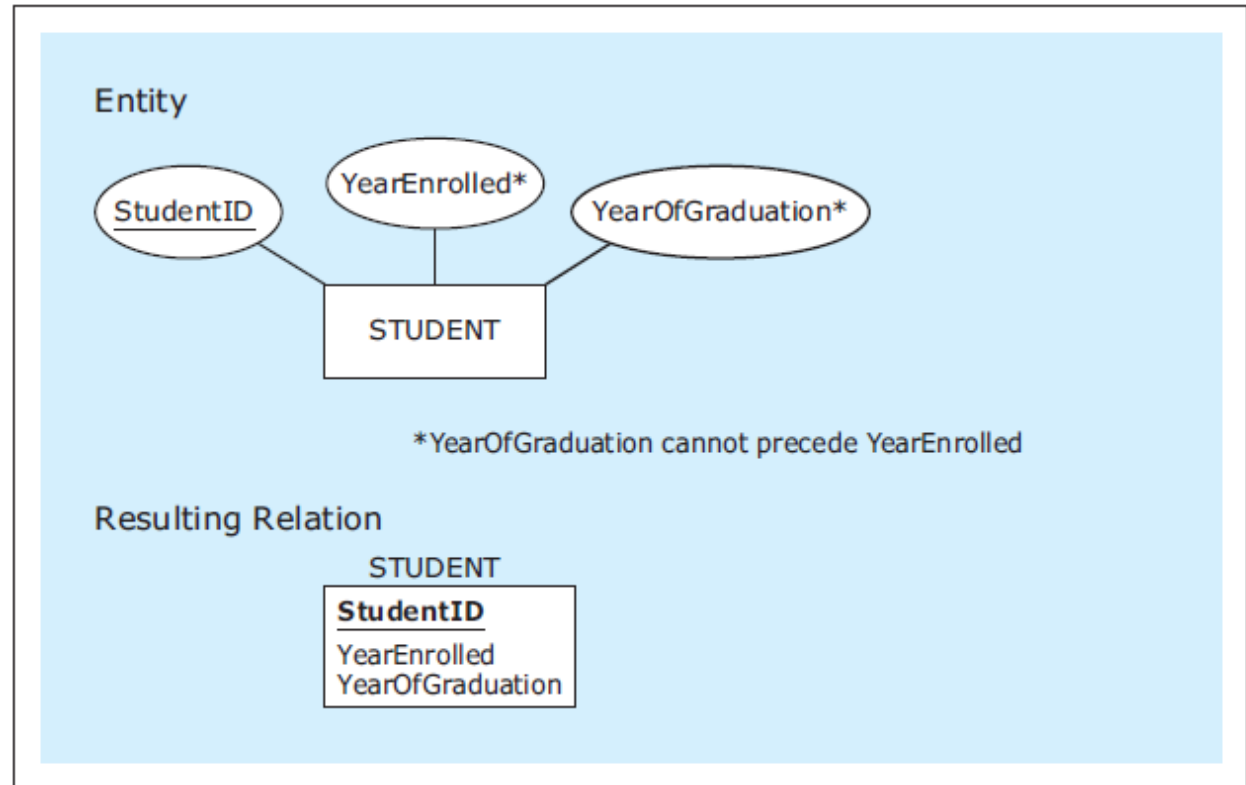


Sample data records for the mapped relation

EMPLOYEE	
<u>EmpID</u>	Salary
1234	\$75,000
2345	\$50,000
3456	\$55,000
1324	\$70,000

# RELATIONAL DATABASE CONSTRAINTS

Business rule for  
the dates of  
enrollment and  
graduation



Sample data  
records for the  
mapped  
relation

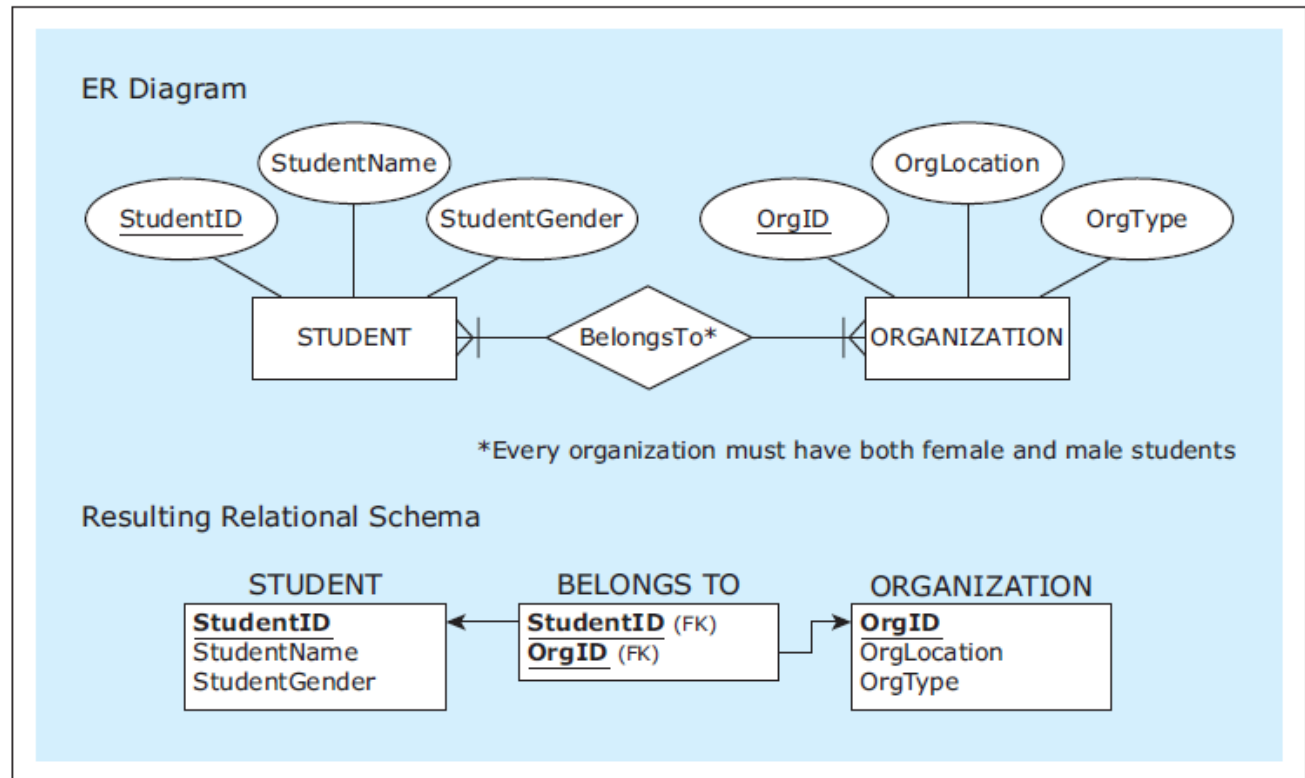
STUDENT

<u>StudentID</u>	YearEnrolled	YearOfGraduation
1111	2012	2016
2222	2013	2017
3333	2013	2017



# RELATIONAL DATABASE CONSTRAINTS

Business rule for gender of students in an organization



Sample data records for the mapped relation

STUDENT			ORGANIZATION			BELONGSTO	
<u>StudentID</u>	StudentName	StudentGender	<u>OrgID</u>	OrgLocation	OrgType	<u>StudentID</u>	<u>OrgID</u>
1111	Robin	M	O11	Student Hall	Charity	1111	O11
2222	Pat	M	O41	Damen Hall	Sport	3333	O11
3333	Jami	F	O47	Student Hall	Charity	2222	O11
						3333	O41
						2222	O41
						3333	O47
						1111	O47