





CSE3103 : Database

Nazmus Sakib
Assistant Professor
Department of Computer Science and Engineering
Ahsanullah University of Science and Technology

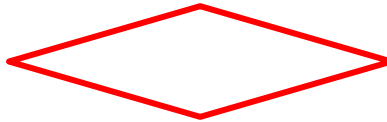
ER Diagram Symbols:

- The symbols [crows feet notations] that are representing ERD in below:

- Entity [rectangle]



- Relationship [diamond]



- Attributes [ellipse]



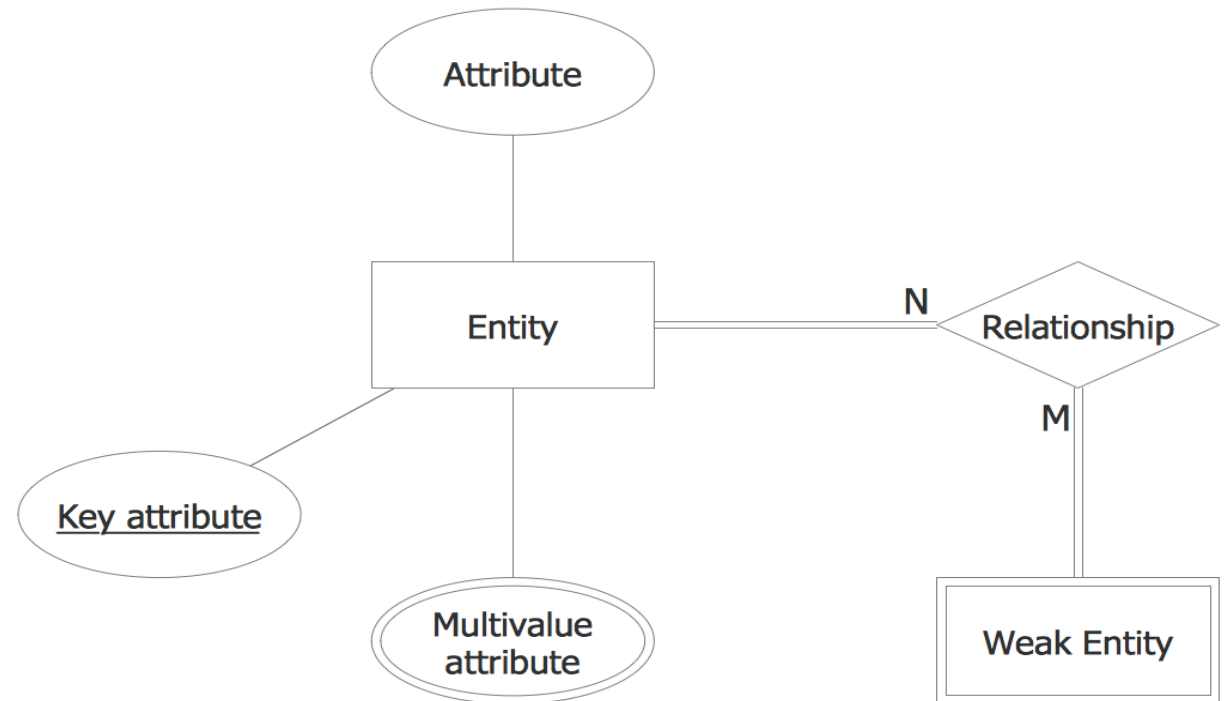
- If one entity need to connect with the other entity there must need to join with some relationship.
- A relationship is basically a table, which take attribute from the associate tables and may add more attributes if needed.

Draw Your First ERD

- Scenario:

AUST is one of the prestigious private university in Bangladesh. There are eight departments in this university which is situated at Tejgoan I/A, Dhaka. Students are admitted in different departments. Each of the department has classrooms, labs, halls, etc. Students are enrolled in different courses in a specific semester and receive grades.

Draw an ERD with using proper symbol.



Identify Entity Relationships and Attributes

- Scenario:

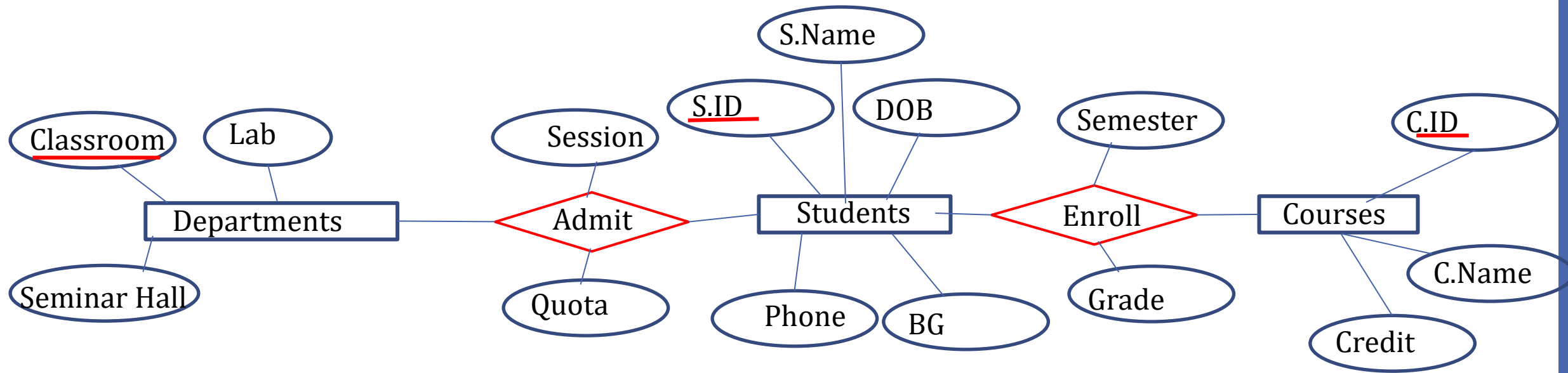
AUST is one of the prestigious private university in Bangladesh. There are eight departments in this university which is situated at Tejgoan I/A, Dhaka. Students are admitted in different departments.

Each of the department has classrooms, labs, seminar halls, etc. Students are enrolled in different courses in a specific semester and receive grades.

Possible Entity:	Possible Relationship:	Possible Attributes
Student Courses Department	Admit Enroll	Department - classroom, lab, seminar halls Student- S.ID, S.Name, DOB, Phone, BG Course- C.ID, C.Name, Credit Admit - Session , Quota Enroll - Semester, Grades

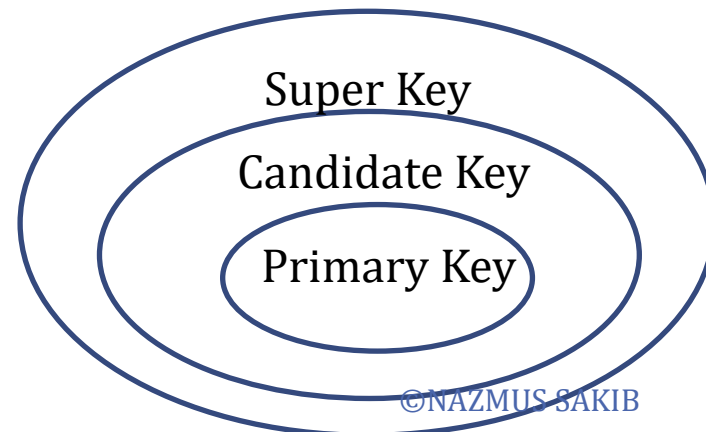
Draw the ERD

Possible Entity:	Possible Relationship:	Possible Attributes
Student Courses Department	Admit Enroll	Department - classroom, lab, seminar halls Student- S.ID, S.Name, DOB, Phone, BG Course- C.ID, C.Name, Credit Admit - Session , Quota Enroll - Semester, Grades



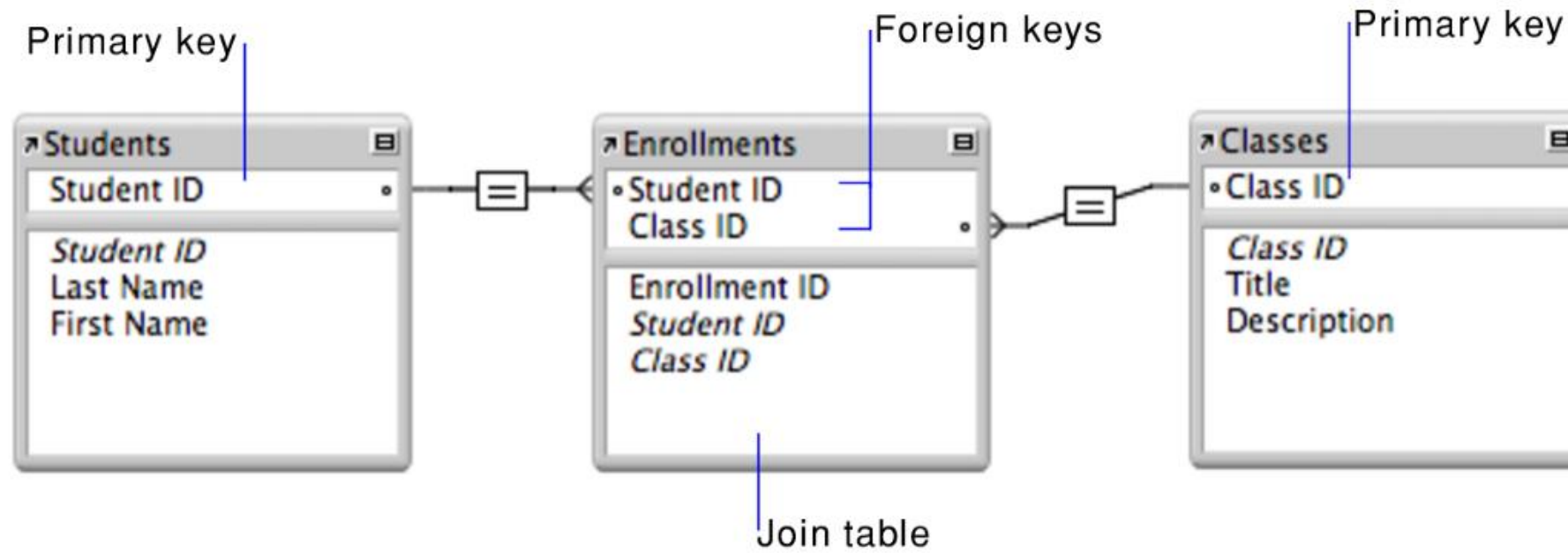
Keys:

1. Super Keys: All the attributes can for super keys.
 1. Suppose, $A = \{1, 2, 3, 4\}$
 2. So, $P(A) = \{\{1\}, \{2\}, \{3\}, \{4\}, \{1,2\}, \{2,3\}, \{3,4\}, \dots, \{1,2,3,4\}, \{\}\}$
2. Candidate Key: Super keys which value can be minimal.
3. Primary Key: Candidate key which value is unique.
4. Alternative Key: Keys which are candidate key but not in primary key.
5. Composite Key: More than one attribute jointly declare as primary key is the composite key.
6. Foreign Key: Primary key which is used another table as reference is foreign key.



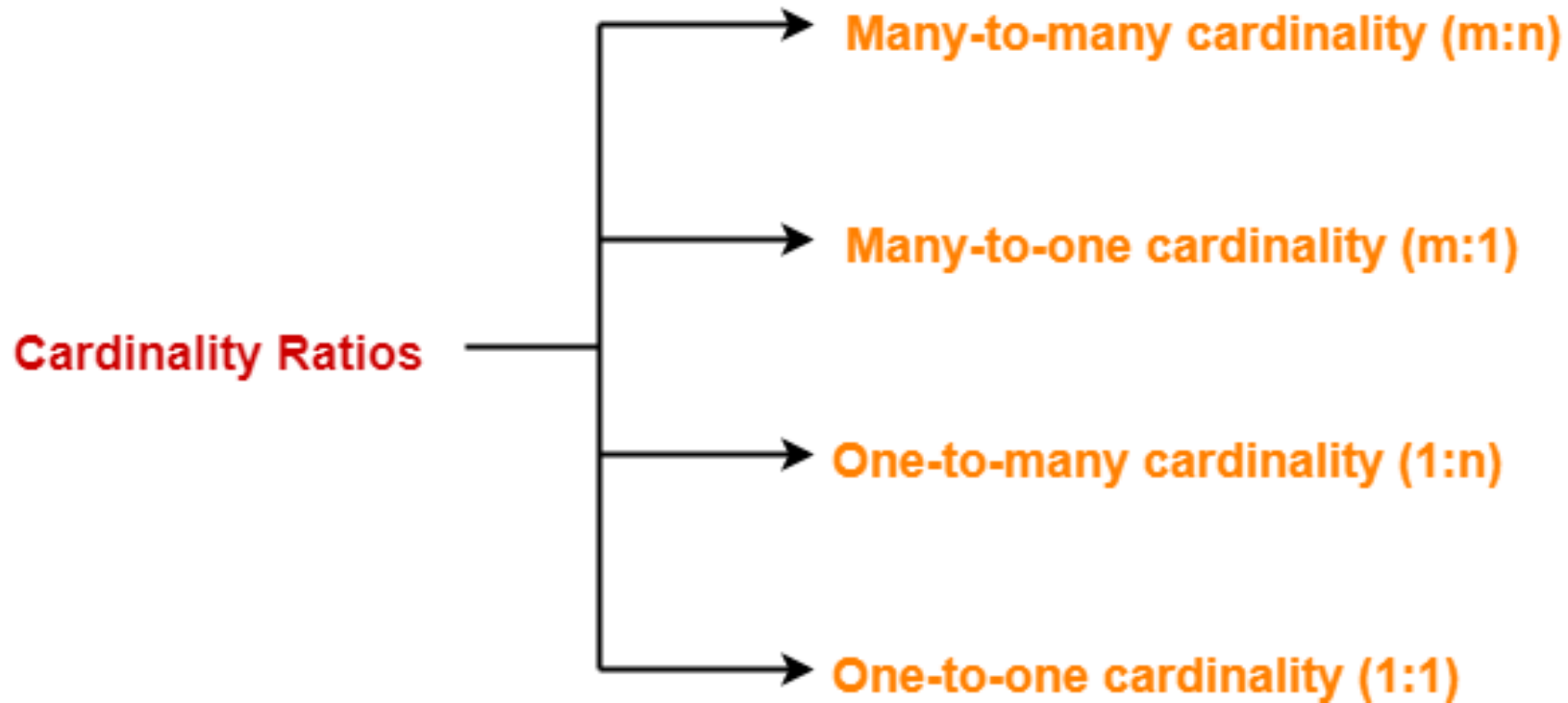
Primary Key:

- The attribute which can distinguish an entity from another can be a primary key.
 - Primary key should be underlined in ERD.
 - More than one attribute can form primary key.
 - Primary Key will be minimum number attributes.
 - Primary Key can be the attribute which is most frequently used and most used to form.

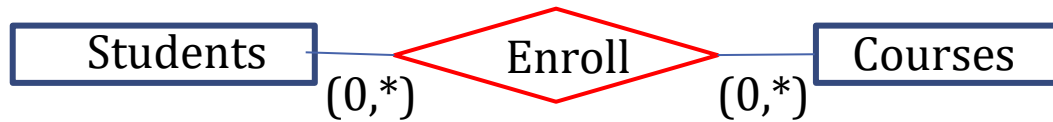


Cardinality Constraints of Relationship:

- Express the maximum number of Entity that can be associated with another entity via a relationship.



Many to Many:



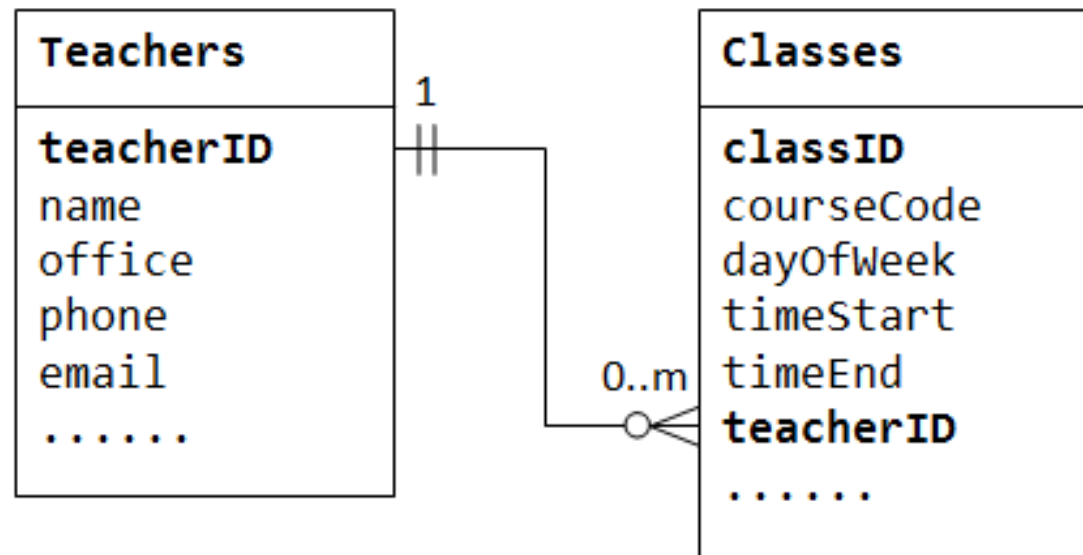
Author

AuthID	Name	City	Mobile
101	Rahul	Patna	2569874
102	Sonam	Kolkata	4587985
103	Kunal	Mumbai	4789854

Book

BookID	Name	Date	Price	AuthID	AuthID2
151	DBMS	12-1-2000	300	101	102
152	Data	14-2-2003	200	101	103
153	C	16-3-2006	400	103	

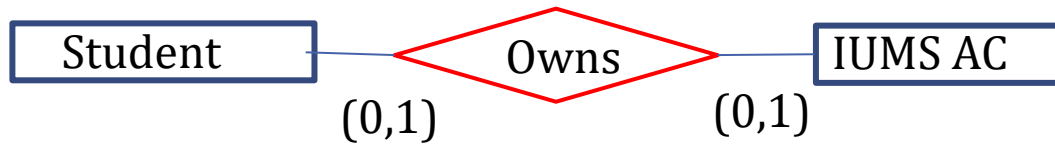
One to many:



Many to One:



One to One:

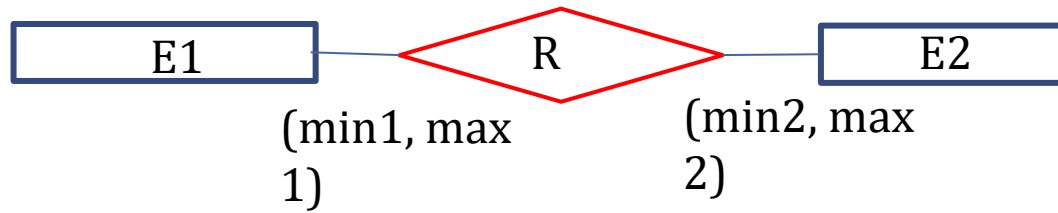


People	
ID	Name
1	Alice
2	Bob
3	Cathy

One-to-One

Drivers Licenses	
UserID	Number
1	F25532
2	S43212
3	B98364

Cardinality Limit



Relationship	$(\min 1, \max 1)$	$(\min 2, \max 2)$
Many – To – Many	$(0, *)$	$(0, *)$
Many – To – One	$(0, 1)$	$(0, *)$
One – To – Many	$(0, *)$	$(0, 1)$
One – To - One	$(0, 1)$	$(0, 1)$

