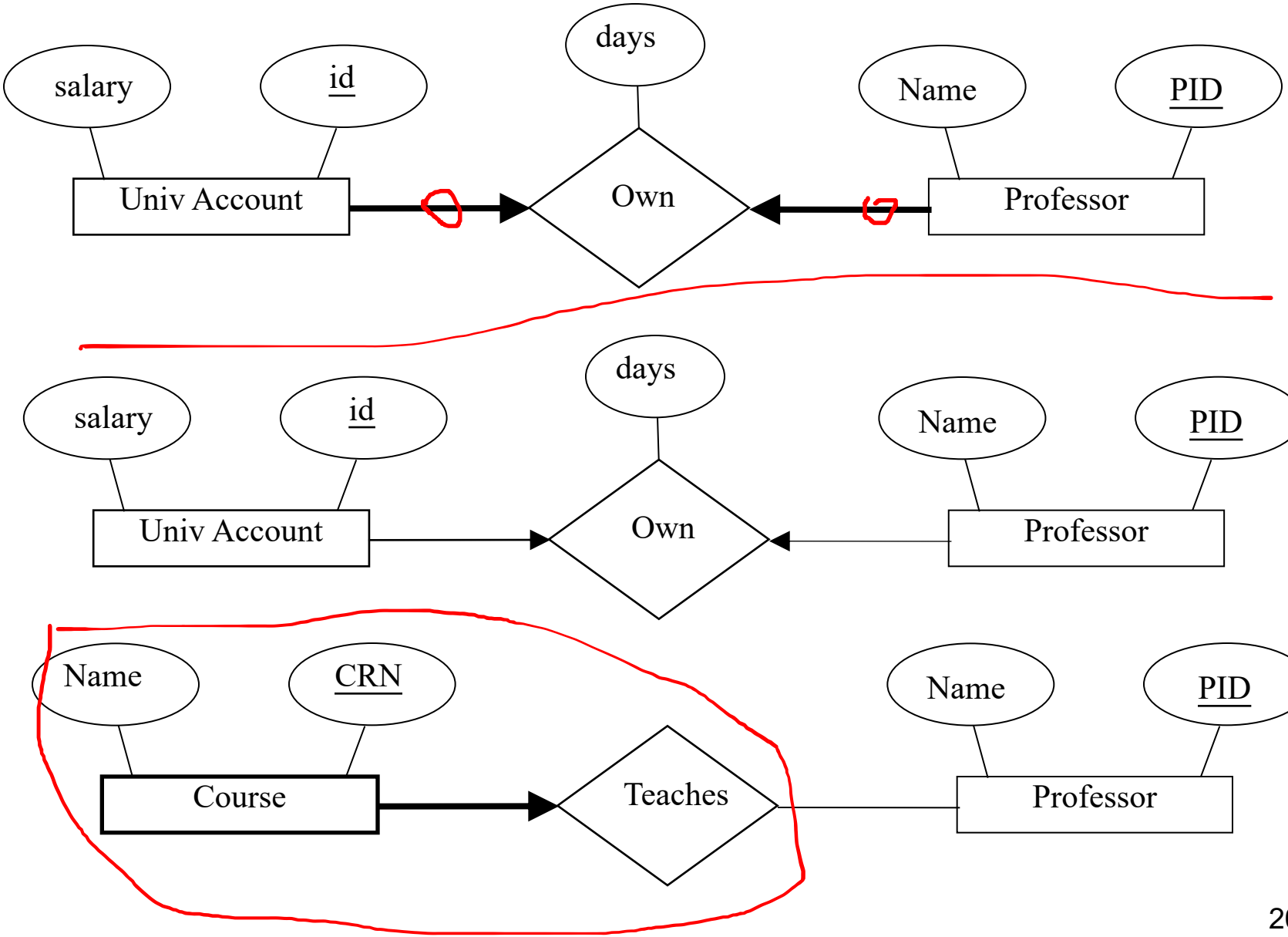
CSCI4333 Database Design & Implement

Lecture Ten – Relational Model 4

Instructor: Dr. Yifeng Gao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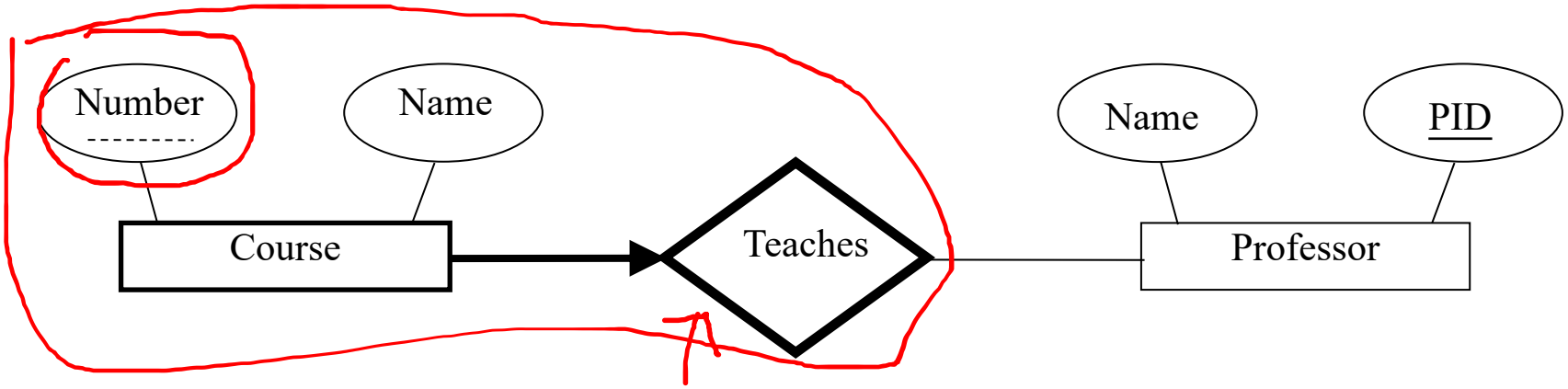
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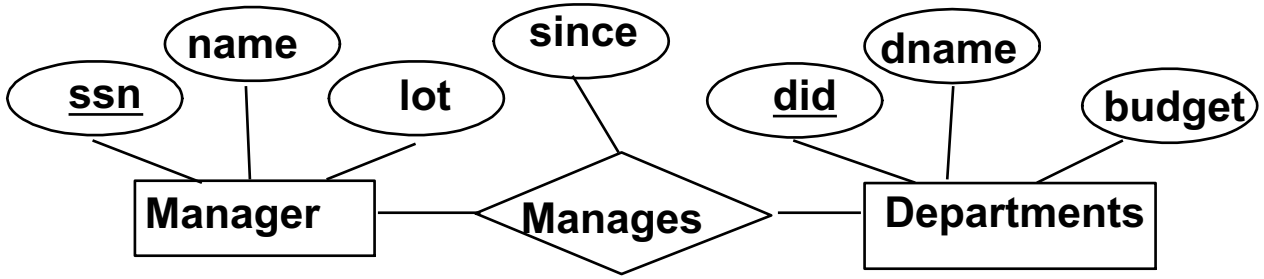
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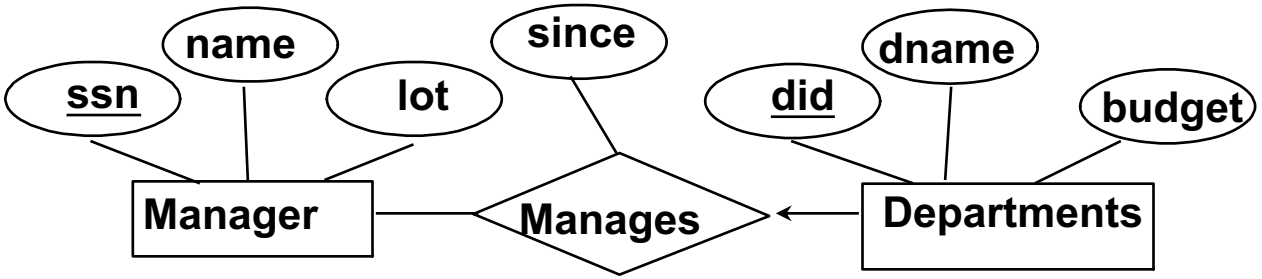
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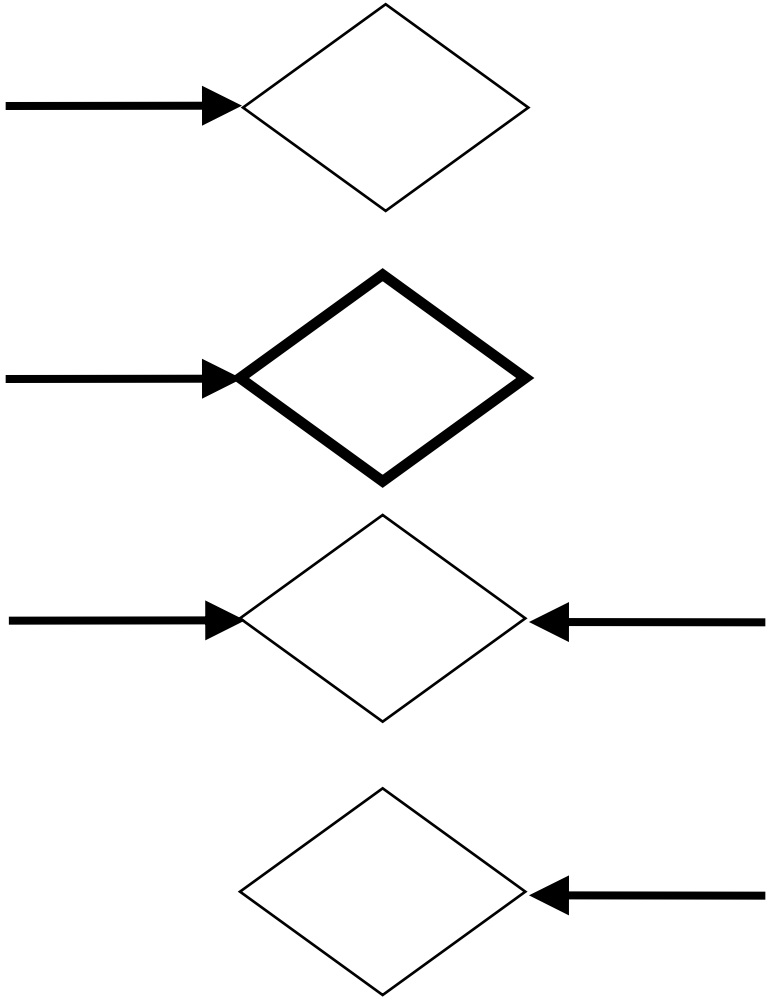
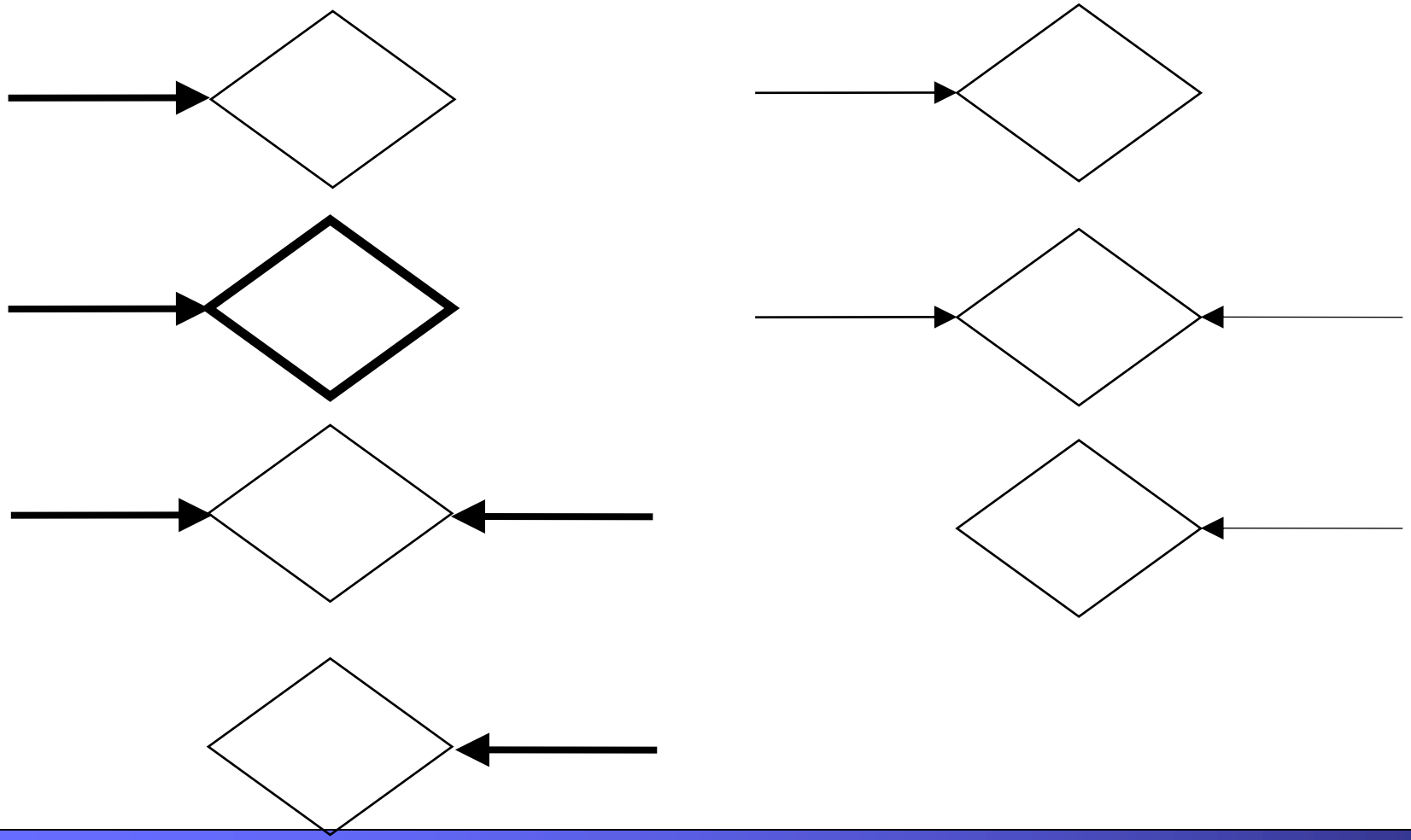
Cheatsheet

- Must Merge:

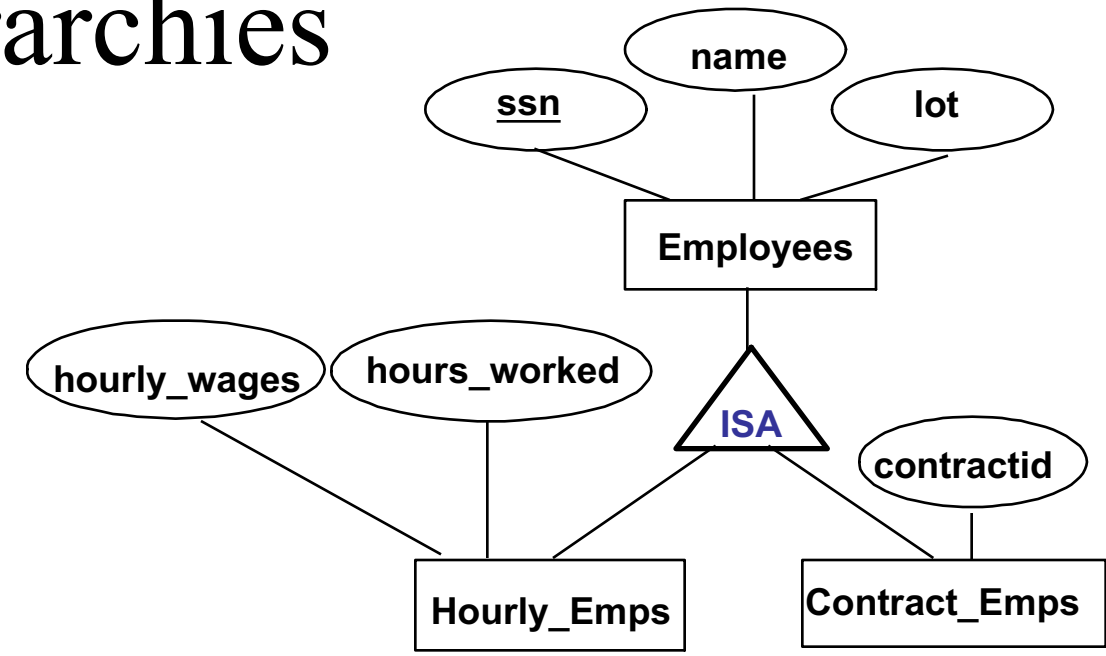


Cheatsheet

- Single Primary Key: Any ER has an arrow



ISA (‘is a’) Hierarchies



General approach:

3 relations: Employees, Hourly_Emps and Contract_Emps.

- *Employee(ssn,name,lot)*
- *Hourly_Emps*(*hourly_wages*, *hours_worked*, *ssn)*;
  - must delete Hourly_Emps tuple if referenced Employees tuple is deleted.
- Contract_Emps: Contract_Emps (contract_id,ssn);
  - must delete Contract_Emps tuple if referenced Employees tuple is deleted.

isA

- CREATE TABLE Employee(
  ssn CHAR(10),
  name CHAR(10),
  lot INTEGER,
  PRIMARY KEY (ssn)
  );

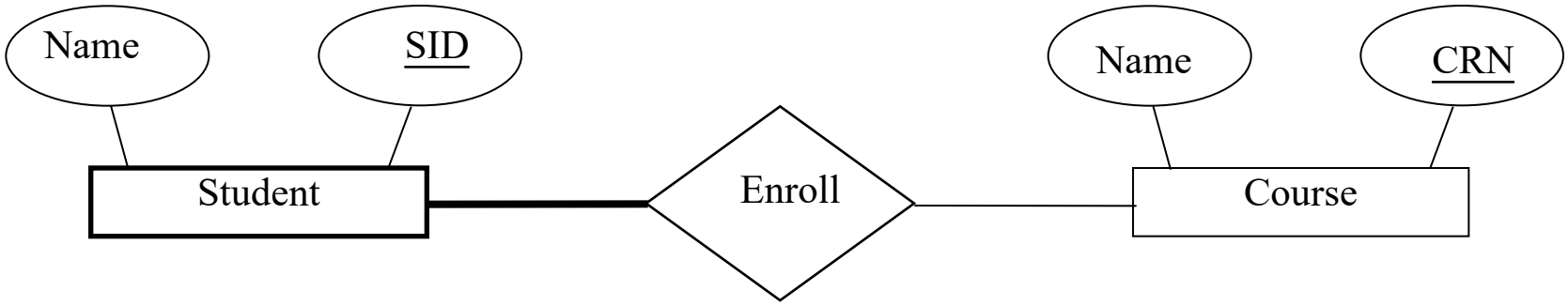
isA

- CREATE TABLE Hourly_Emps(
  ssn CHAR(10),
  hourly_wages INTEGER,
  hours_worked INTEGER,
  PRIMARY KEY (ssn)
  FOREIGN KEY (ssn) REFERENCE Employee
  ON DELETE CASCADE
  );

isA

- CREATE TABLE Contract_Emps(
  ssn CHAR(10),
  hourly_contractid CHAR(10),
  PRIMARY KEY (ssn)
  FOREIGN KEY (ssn) REFERENCE Employee
  ON DELETE CASCADE
  );

How to address this case?



Only solution so far is just combined two table….

But it indeed increase the space cost!

How to address this case?

- CREATE TABLE Student (

  Name CHAR(10),

  SID CHAR(10),

  PRIMARY KEY (SID)

  FOREIGN KEY (SID) REFERENCE Enroll);

Relational Model: Summary

- A tabular representation of data.
- Simple and intuitive, currently the most widely used.
- Integrity constraints can be specified by the DBA, based on application semantics. DBMS checks for violations.
  - Two important ICs: primary and foreign keys
  - In addition, we *always* have domain constraints.
- Powerful and natural query languages exist.
- Rules to translate ER to relational model

One More Thing!

```
CREATE TABLE Enrolled
  (sid CHAR(20),
   cid  CHAR(20),
   grade CHAR(2),
   PRIMARY KEY  (sid,cid) );
```

Oracle - Industrial level. Paid Software

```
CREATE TABLE artist(
  artistid    INTEGER PRIMARY KEY,
  artistname  TEXT
);
```

SQLite - lightweight SQL, naturally come with python

```
create table tutorials_tbl(
   tutorial_id INT NOT NULL AUTO_INCREMENT,
   tutorial_title VARCHAR(100) NOT NULL,
   tutorial_author VARCHAR(40) NOT NULL,
   submission_date DATE,
   PRIMARY KEY ( tutorial_id )
);
```

MySQL - opensource version SQL