# Quiz (Selected)

- Know how to find the relationship of tables (1:1, 1:m, m:n)
- Which of the following concepts is not specified by the ER model/ERD?
  - Attribute Types/Key Attribute Types/**Attribute Type Domains** /None of the above
  - Attribute Type Domain: possible values for that attribute
    - Product.Price is integer. Then, integer is the **Attribute Type** of Product.Price. Integers greater than zero is the **Attribute Type Domain** of Product.Price.
- True or False
  - Customer is a generalization of Person (F)
  - **Artist is a generalization of Painter (T)**
  - Concert is a generalization of music event (F)
  - **Midterm is a specialization of Exam (T)**
  - Student is a specialization of Teacher Assistant (F)
  - Article is a specialization of Book (F)

# Design Principles

No redundant or repetitive data. (see slides for more principles)

# Common SQL Transforms

- `CREATE TABLE T2 AS SELECT`
- `SELECT a,b,c FROM T1`
  `UNION ALL`
  `SELECT d, e, f FROM T2`
- `SELECT a,b,c FROM T1`
  `UNION DISTINCT`
  `SELECT d, e, f FROM T2`
- `SELECT CAST (xyz AS DATE)`
- `SELECT SAFE_CAST (xyz AS DATE)`

# Database Normalization

There are many different levels but people mostly use up to 3rd normalization.
1NF: all attributes have scalar values
2NF: 1NF + all non-key attributes must be functionally determined by the entire primary key.
3NF: 2NF + all non-key attributes must be functionally determined by **only** the primary key.

## SQL Transform Demo

Here are some demo code we used.

```
create table college.Student as
select sid, fname, lname, dob
from blah.CurrentStudents
union distinct
select sid, fname, lname, cast(dob as string) as dob
from blah.NewStudents

select sid, fname, lname, dob
from college.Student
order by sid

create table college.Teacher as
select tid, instructor, dept
from blah.Classes
where tid is not null
order by tid

create table college.Class as
select cno, cname, credits
from blah.Classes
where cno is not null
order by cno
```

```sql
create table college.Takes as
select distinct sid, cno, grade
from blah.CurrentStudents

create table college.Teaches as
select distinct tid, cno
from blah.Classes
where tid is not null
and cno is not null
order by tid

delete from college.Takes where sid in
(select T2.cno as cno2 from
college.Teaches T1 left join college.Class T2 on T1.cno
= T2.cno
where T2.cno is null)
```