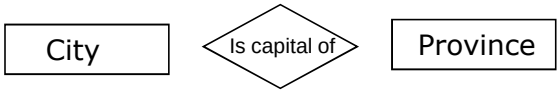
Question One

- Consider the following relationship:



Question One

- What is the participation of the entity **City** in the relationship "City is capital of Province"**?**
  - A. Total
  - B. **Partial**

Question One

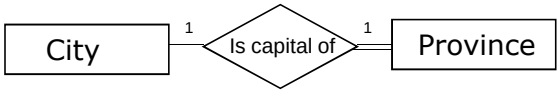
- What is the participation of the entity **Province** in the relationship "City is capital of Province"**?**
  - A. **Total**
  - B. Partial

Question One

- What is the cardinality of the relationship **is capital of** between City and Province?
  - A. **One to One**
  - B. One to Many
  - C. Many to One
  - D. Many to Many

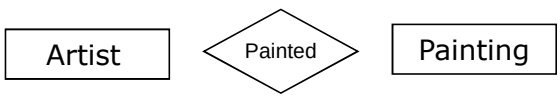
Question One

- Completed E/R Diagram:



Question Two

- Consider the following relationship:



Question Two

- What is the participation of the entity **Artist** in the relationship "Artist painted Painting"?
  - A. Total
  - B. **Partial**

Question Two

- What is the participation of the entity **Painting** in the relationship "Artist painted Painting"**?**
  - A. **Total**
  - B. Partial

Question Two

- What is the cardinality of the relationship painted between Artist and Painting?
  - A. One to One
  - B. **One to Many**
  - C. Many to One
  - D. Many to Many

Question Two

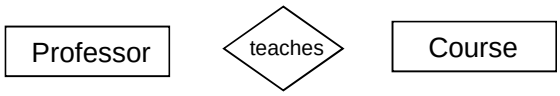
- Completed E/R Diagram:

Question Three

- At a university you have professors who teach courses and courses are assigned to classrooms
- Each professor has a unique faculty ID, first name, last name and an office number.
- Each course has a unique course ID and course name.
- Each classroom has a unique classroom ID, building location, room number and capacity (# of seats)
- Assume that:
  - A professor may not teach any courses
  - A course will have only one professor teaching it
  - All courses are taught in only one classroom
  - Some classrooms are not used
  - Record the day and time for when classes are taught in a classroom

Question Three

- Consider:



Question Three

- What is the cardinality of the relationship **teaches** between Professor and Course?
  - A. One to One
  - B. **One to Many**
  - C. Many to One
  - D. Many to Many

Question Three

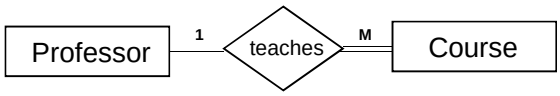
- What is the participation of the entity Professor in the relationship “Professor teaches Courses”?
  - A. Total
  - B. **Partial**

Question Three

- What is the participation of the entity Courses in the relationship “Professor teaches Courses”?
  - A. **Total**
  - B. Partial

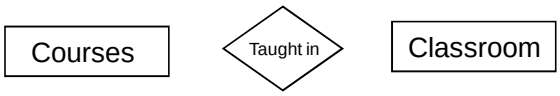
Question Three

- Completed:



Question Three

- Consider:



Question Three

- What is the cardinality of the relationship **taught in** between Course and Classroom?
  - A. One to One
  - B. One to Many
  - C. **Many to One**
  - D. Many to Many

Question Three

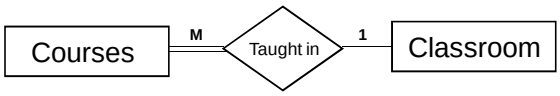
- What is the participation of the entity Course in the relationship "Courses taught in Classroom"?
  - A. **Total**
  - B. Partial

Question Three

- What is the participation of the entity Classroom in the relationship “Courses taught in Classroom”?
  - A. Total
  - B. **Partial**

Question Three

- Completed:



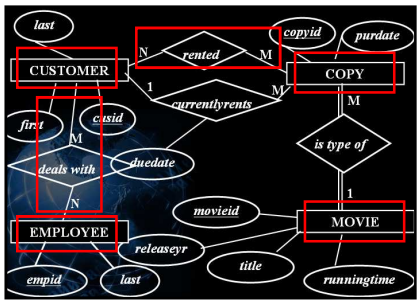
Question Three

- How many attributes would be stored in the Professor table in the relational database?
  - A. Less than 2
  - B. 2
  - C. 3
  - D. **4**
  - E. More than 4

Question Three

- How many tables would be created for this scenario with a university, when the ER Diagram is converted to a relational database in MS Access?
  - A. Less than 2
  - B. 2
  - C. **3**
  - D. 4
  - E. More than 4

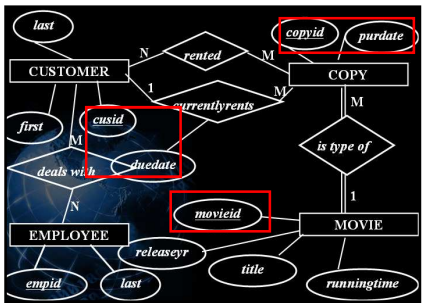
How many tables will this E-R diagram map too?



Answer

- 6 Tables
  - 1 table for each of entity
    - COPY, CUSTOMER, MOVIE & EMPLOYEE
  - 1 table for DEALS WITH
  - 1 table for RENTED

How many columns will be in the COPY table?



Answer

- 5 fields
  - CopyId and purdate
  - CurrRentsCusID and duedate
  - TypeofMovieID

Next Question:

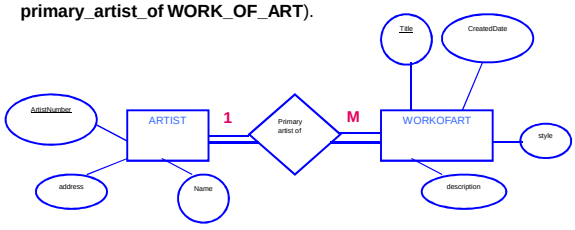
- A database is being constructed to hold data about works of art.
- The database will be used by artists, galleries and action houses to track the current location of the art. The database will hold data about the artist(s) who created the work of art, the current location of the work of art and a single appraisal of the work if an appraisal of the work has been completed.

- When a work of art is completed, the data describing the work is entered into the database.
  - The data will include
    - unique title for the work
    - date the work was completed
    - style of the work
    - textual description of the work.
- Artists may collaborate on works of art or an artist may be the sole creator of the work.
  - If an artist is the sole creator of the work then they are the "primary" creator of the work.
  - If two or more artists collaborate on a work of art, then one of the artists must be selected as the "primary" creator and all other artists involved with the work are considered to be "secondary" artists.
  - Artists are free to enter as many of their works of art as they wish into the database.
  - If an artist is not in the database, then they are entered when the description of their first work is entered.
  - When an artist is added to the database, they are given a unique artist number and they must provide their name and address.

- When a work of art is added to the database, its current location is stored in the database.
  - If the location is not already in the database, then this new location is added when the work of art is added to the database.
  - The location of the work of art includes a unique name for the location, the address and the phone number.
  - The current location of the work must be stored in the database.
  - Locations that are no longer used to house works of art must be removed from the database.
  - If the location of the work is "unknown" then the predefined location name "unknown" is used as the location and the address and phone number values are left blank.

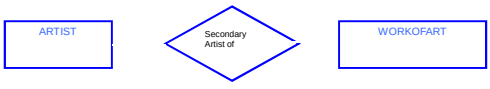
- If the work of art has been appraised, the appraiser will provide the details of the appraisal so they can be entered into the database. These details are
  - unique appraisal number
  - date of the appraisal
  - name of the appraiser
  - value of the work of art.
- It has been determined that the database will contain the following entities:
  - ARTIST – artist(s) who created a work of art
  - WORK_OF_ART – a work of art
  - LOCATION – current location of a work of art
  - APPRAISAL – data describing an appraisal of a work of art
- **Do not add any extra information because of your personal experience.**

- Consider the relationship **primary_artist_of** that exists between the **ARTIST** entity and the **WORK_OF_ART** entity (**ARTIST primary_artist_of WORK_OF_ART**).



Cardinality of this relationship.

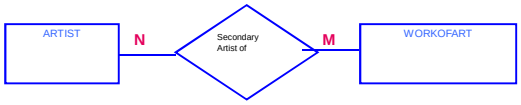
- Consider the relationship **secondary_artist_of** that exists between the **ARTIST** entity and the **WORK_OF_ART** entity (**ARTIST secondary_artist_of WORK_OF_ART**).



What is the participation of the Artist?
Total or Partial

What is the participation of the Work_of_Art?
Total or Partial

- Consider the relationship **secondary_artist_of** that exists between the **ARTIST** entity and the **WORK_OF_ART** entity (**ARTIST secondary_artist_of WORK_OF_ART**).



What is the cardinality of this relationship?
- **one to one**
- **one to many**
- **many to one**
- **many to many**

- Consider the relationship **located_at** that exists between the **WORK_OF_ART** entity and the **LOCATION** entity (**WORK_OF_ART located_at LOCATION**).

What is the participation of the Work_of_Art?
Total or Partial

What is the participation of the Location?
Total or Partial

- Consider the relationship **located_at** that exists between the **WORK_OF_ART** entity and the **LOCATION** entity (**WORK_OF_ART located_at LOCATION**).

What is the cardinality of this relationship?
- **one to one**
- **one to many**
- **many to one**
- **many to many**

- Consider the relationship **appraisal_of** that exists between the **APPRAISAL** entity and the **WORK_OF_ART** entity (**APPRAISAL appraisal_of WORK_OF_ART**).

What is the participation of the Appraisal?
Total or Partial

What is the participation of the Work_of_Art?
Total or Partial

- Consider the relationship **appraisal_of** that exists between the **APPRAISAL** entity and the **WORK_OF_ART** entity (**APPRAISAL appraisal_of WORK_OF_ART**).

What is the cardinality of this relationship?

- **one to one**
- **one to many**
- **many to one**
- **many to many**

- Database "Western.mdb" created to demonstrate database queries
  - Contains fictitious information about
    - UWO courses
    - Professors
    - Students
    - Relationships:
      - who teaches which courses
      - who takes which courses
  - Five tables defined as follows.

The fields for Table **COURSE** are:

Field Name	Field Type	Sample Data
CID	text	147
SUBJECT	text	Computer Science
COURSENUM	text	029
TERM	text	A, B, E, or Null
SECTION	text	003

The fields for table **STUDENT** are:

Field Name	Field Type	Sample Data
SID	text	4288611
LASTNAME	text	Smith
FIRSTNAME	text	Jon
STREET	text	60 Dundas St .
CITY	text	London
PROVINCE	text	Ont.
POSTAL	text	N6A 5B7
PHONE	text	(519)661-2111

The fields for Table **PROF** are:

Field Name	Field Type	Sample Data
PID	text	AP111
LASTNAME	text	Bauer
FIRSTNAME	text	Michael
OFFICE	text	SSC 5129
PHONE-EXT	text	4000
SALARY	number	74500
HIRED-ON	date	1/6/90

The fields for Table **TAKES** are:

Field Name	Field Type	Sample Data
SID	text	4288611
CID	text	147
MARK	number	76
YEAR-TAKEN	number	1999

The fields for Table **TEACHES** are:

Field Name	Field Type	Sample Data
PID	text	AP111
CID	text	147

Question One

Create an SQL statement to add an instance of the TAKES relationship to the database.

Use the value “250121314” for the SID, the value “191” for the CID, 83 for the mark and “2004” as the year taken.

INSERT INTO
TAKES (SID, CID, mark, year-taken)
VALUES (“250121314”, “191”, 83, 2004)

Question Two

Create an SQL statement to change the city attribute to “Waterloo” for the student with the SID “250121314”.

UPDATE STUDENT
SET CITY = “Waterloo”
WHERE SID =”250121314”

Question Three

Create an SQL statement to delete all courses with the CID “207”.

DELETE FROM COURSE
WHERE CID =”207”

Question Four

Create an SQL statement to retrieve the names (first and last) of all of the professors who use the office “TH 3113”.

```
SELECT FIRSTNAME, LASTNAME
  FROM PROF
    WHERE OFFICE = “TH 3113”
```

Question Five

Create an SQL statement to retrieve the names (first and last) of all of the professors who have the number “118” somewhere in their phone number extension.

```
SELECT FIRSTNAME, LASTNAME
  FROM PROF
    WHERE PHONE-EXT LIKE “*118*”
```

Question Six

Create an SQL statement to retrieve the number of professors in the database.

```
SELECT COUNT(PID) FROM PROF
```

Question Seven

Create an SQL statement to retrieve the CIDs, subject and course number of the courses taken by the student with the SID “250121314”.

```
SELECT CID, SUBJECT, COURSENUM
  FROM COURSE INNER JOIN TAKES
        ON COURSE.CID = TAKES.CID
  WHERE SID =”250121314”
```

Question Eight

```
SELECT STUDENT.FIRSTNAME,
STUDENT.LASTNAME
FROM
 ((((STUDENT INNER JOIN TAKES ON
       TAKES.SID = STUDENT.SID)
    INNER JOIN COURES ON
       COURSE.CID=TAKES.CID)
    INNER JOIN TEACHES ON
      TEACHES.CID=COURSE.CID)
    INNER JOIN PROF ON
       PROF.PID = TEACHES.PID)
 WHERE PROF.FIRSTNAME="Andrew"
AND PROF.LASTNAME="Marshall"
```

- **Develop Queries for each of the following:**

1) Find Yisheng Zhang's student number and show the student's first name, last name, and the student number.
2) Find professor Martha Mottola's phone extension and show the professor's first name, last name, and phone extension.
3) Find the term designation(s) (A, B, E, *etc.*) for Geology 024. List the subject, course number, and term(s) during which the course is offered.
4) Find and list the first name, the last name, the date hired, and the salary for the professors hired before 1980.
5) Find the first name, the last name, and the office for the professors with their office in University College (UC).
6) Find the first name, the last name, and the phone extension for professors who have a phone extension that ends in "45".
7) Find the average salary for professors.
8) Find the average mark for French courses taken in 1999.
9) Find the highest mark recorded for a Zoology course.
10) Find the courses taken by Jozef Warchol and list the subject, course number, term, and section for each course.

- **Develop Queries for each of the following:**

11) Find the professors who teach English courses. List the professors first and last names, the subject, the course number, the term, and the section.
12) Find the courses taken by Erin McFalls in 2000. List subject, course number, term, section & mark.
13) Find the students taking professor Gargantini's Computer Science courses in 2001. Show the student's first and last names and their student number.
14) Find the maximum salary for professors that teach English courses. List the first and last names of the professor(s) who make(s) the salary and the salary.
15) Find the professors who make an above average salary and list the professor's first and last names and their salaries.
16) Find the students who have taken or are taking Computer Science 028A and Computer Science 028B. List the first and last names, and the student numbers of the students who have taken both courses.