

Bryce Cortez, Markus Afonso, Saad Al-Mridha

1. What is a relationship, and what three types of relationships exist?

A relationship is an association between entities and the three types are: one to one, one to many, and many to many.

2. Give an example of each of the three types of relationships

A person can have one id to a gym.

A person can have multiple votes.

People can have televisions.

3. What two conditions must be met before an entity can be classified as a weak entity?
Give an example of a weak entity.

Weak Entity:

1. Existence-dependent, in other words, the entity cannot exist without its parent.
2. Has a primary key partially or totally derived from the parent entity in the relationship.

A weak entity has a strong relationship.. An example of this would be a room that can only exist in a building. Without the building, the room can't exist.

EMP_NUM	EMP_LNAME	EMP_INITIAL	EMP_FNAME	DEPT_CODE	JOB_CODE
11234	Friedman	K	Robert	MKTG	12
11238	Olanski	D	Delbert	MKTG	12
11241	Fontein		Juliette	INFS	5
11242	Cruazona	J	Maria	ENG	9
11245	Smithson	B	Bernard	INFS	6
11248	Washington	G	Oleta	ENGR	8
11256	McBride		Randall	ENGR	8
11257	Kachinn	D	Melanie	MKTG	14
11258	Smith	W	William	MKTG	14
11260	Ratula	A	Katrina	INFS	5

4. What is a strong (or identifying) relationship, and how is it depicted in a Crow's Foot ERD?

A strong relationship exists when an entity is existence-dependent on another entity and inherits at least part of its primary key from that entity. In visio, this is shown by a solid line.

5. Using the diagram above identify and describe the components of the table. List the entity name, attributes, number of tuples, primary key, and foreign keys. Use your knowledge of naming conventions to identify the table's probable foreign keys.

entity names: EMPLOYEES

Attributes: EMP_NUM - employee number, EMP_LNAME - employee last name, EMP_INITIAL - employee initial, EMP_FNAME - employee first name, DEPT_CODE - department code, JOB_CODE - job code

number of tuples: 10

primary key: EMP_NUM

Possible foreign keys: DEPT_CODE and/or JOB_CODE

6. What is an associative entity, and when is it used?

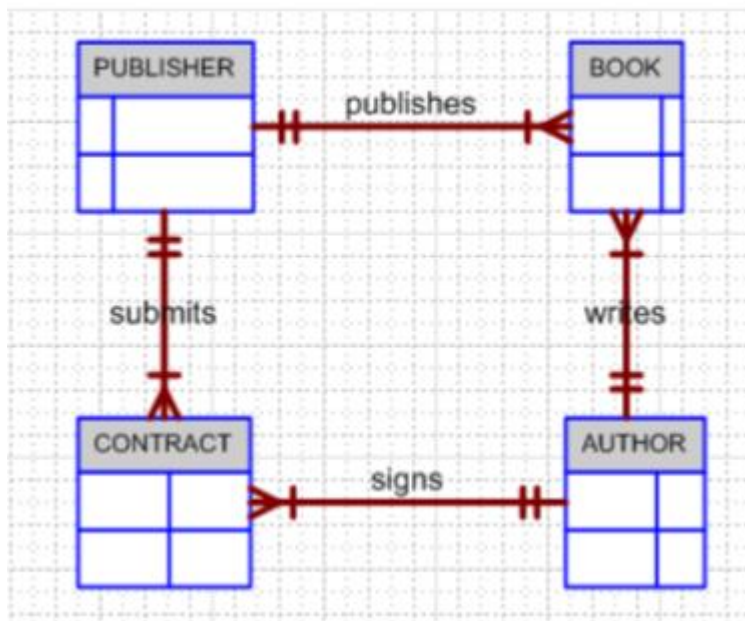
Associative entities relate the instances of several entity types. They also contain attributes specific to the relationship between those entity instances. Associative Entities are used for Many-To-Many Relationships between other entities. For example: Many Students take many different Courses, would have an associative entity called Student_Courses.

7. What is a recursive relationship? Give an example.

A recursive relationship exists when an entity is related to itself. For example: the "Class Representative" relationship demonstrates that a student among class will be a Set Rep; however, a Student requires another Student to be a Set Rep.

8. What is a derived attribute? Give an example.

A derived attribute is an attribute whose value is calculated (derived) from other attributes. For example an employer's age.



9. Using the above diagram, write the business rules that are reflected in the ERD.

A publisher publishes many books
An author writes many books.
An author signs many contracts
A publisher submits many contracts.

10. What are multivalued attributes, and how should they be handled within the database design?

As the name implies, multi-valued attributes may have many values. For example, a person's education may include a high school diploma, a 2-year college associate degree, a four-year college degree, a Master's degree, and a Doctoral degree. Crow's foot notation doesn't recognize multi-valued attributes but within the database they can be handled a few different ways: first, they are added in as a string, separated by commas or hyphens, but this can cause problems. Secondly, they can be split into new attributes. This solution can work but can cause problems.

Table name: DIRECTOR			Database name: Ch03_Theater		
DIR_NUM	DIR_LNAME	DIR_DOB			
100	Broadway	12-Jan-65			
101	Hollywoody	18-Nov-53			
102	Goofy	21-Jun-62			

Table name: PLAY					
PLAY_CODE	PLAY_NAME	DIR_NUM			
1001	Cat On a Cold, Bare Roof	102			
1002	Hold the Mayo, Pass the Bread	101			
1003	I Never Promised You Coffee	102			
1004	Silly Putty Goes To Washington	100			
1005	See No Sound, Hear No Sight	101			
1006	Starstruck in Biloxi	102			
1007	Stranger In Parrot Ice	101			

11. Using the above diagram, identify the primary keys, and the foreign keys.

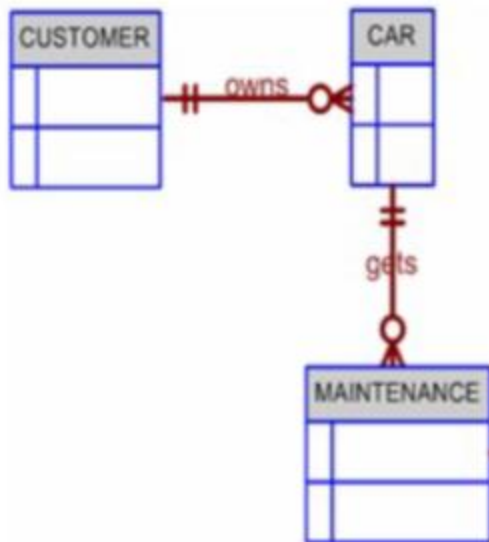
DIR_NUM is the DIRECTOR table's primary key. PLAY_CODE is the PLAY table's primary key and its foreign key is DIR_NUM

12. Discuss the difference between a composite key and a composite attribute. How would each be indicated in an ERD?

Composite keys consist of more than one attribute. A composite key is shown in the ER diagram by how more than one attribute name is underlined to indicate its participation in the primary key if the ER diagram has the attribute names for each of its entities.

13. Briefly, but precisely, explain the difference between single-valued attributes and simple attributes. Give an example of each.

A single valued attribute is one that can have only one value. For example, a worker and only one social security number. A simple attribute is one that cannot be decomposed into its component pieces. For example, a person's eye color is classified as brown, blue, or green and there is no reasonable way to decompose them.



14. Write the business rules that are reflected in the figure above.

A customer owns cars.
A car gets many types of maintenance.

15. Given the entities of COURSE and CLASS below, discuss two ways in which the 1:M relationship between COURSE and CLASS can be implemented. (Hint: Think about relationship strength. Also, you will need to add an additional attribute for one of the relationships.)

COURSE(CRS_CODE, CRS_TITLE, CRS_DESCRIPTION, CRS_CREDITS)
CLASS(CRS_CODE, CLASS_SECTION, CLASS_TIME, CLASS_PLACE)

First:

Because the class needs to have a course, they will have a strong relationship (solid line). Course will have a one to many relationship with class. CRS_CODE is the primary key in course and class and the forging key in class. example:

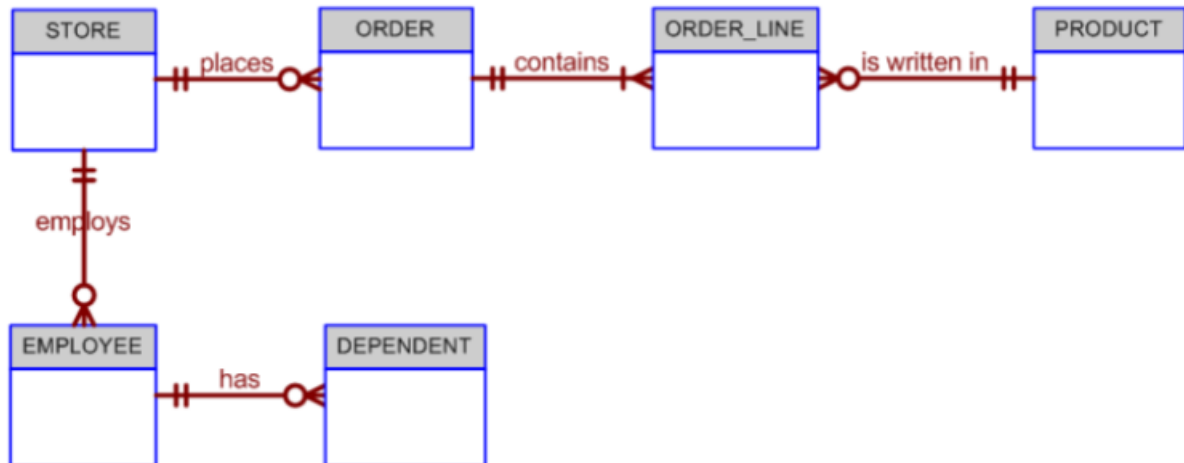
COURSE(**CRS_CODE**, CRS_TITLE, CRS_DESCRIPTION, CRS_CREDITS)
CLASS(**CRS_CODE**, CLASS_SECTION, CLASS_TIME, CLASS_PLACE)

Second:

The class and course will have a weak relationship. To this we need to add an attribute to be a primary key. This is because CRS_CODE is foreign key, and CLASS_SECTION, CLASS_TIME, CLASS_PLACE are not unique.

COURSE(**CRS_CODE**, CRS_TITLE, CRS_DESCRIPTION, CRS_CREDITS)
 CLASS(**CLASS_NUM**, CRS_CODE, CLASS_SECTION, CLASS_TIME, CLASS_PLACE)

16.



16. Using the figure above, identify all of the cardinalities.

From store to product, right to left. (1,1) (0,N) (1,1) (1,N) (0,N) (1,1)

Down to employee (1,1) (0,N)

From employee to dependant (1,1) (0,N)

17. What are homonyms and synonyms, and why should they be avoided in database design?

When more than one attribute has the same name, they are referred to as Homonyms. It indicates the use of the same name to label different attributes. Synonyms are when the same attribute has more than one name. Synonyms make it hard to keep track of foreign keys.

18. Using the database shown in the above diagram, identify the primary key and the foreign key(s) for each table. If a table does not have a foreign key, write NONE in the space provided.

Table name: EMPLOYEE						Database name: Ch03_StoreCo	
EMP_CODE	EMP_TITLE	EMP_LNAME	EMP_FNAME	EMP_INITIAL	EMP_DOB	STORE_CODE	
1	Mr.	Williamson	John	vW	21-May-64	3	
2	Ms.	Ratula	Nancy		09-Feb-69	2	
3	Ms.	Greenboro	Lottie	R	02-Oct-61	4	
4	Mrs.	Rumpersfro	Jennie	S	01-Jun-71	5	
5	Mr.	Smith	Robert	L	23-Nov-59	3	
6	Mr.	Renselaer	Cary	A	25-Dec-65	1	
7	Mr.	Ogallio	Roberto	S	31-Jul-62	3	
8	Ms.	Johnsson	Elizabeth	I	10-Sep-68	1	
9	Mr.	Eindsmar	Jack	vW	19-Apr-55	2	
10	Mrs.	Jones	Rose	R	06-Mar-66	4	
11	Mr.	Broderick	Tom		21-Oct-72	3	
12	Mr.	Washington	Alan	Y	08-Sep-74	2	
13	Mr.	Smith	Peter	N	25-Aug-64	3	
14	Ms.	Smith	Sherry	H	25-May-66	4	
15	Mr.	Olenko	Howard	U	24-May-64	5	
16	Mr.	Archialo	Barry	V	03-Sep-60	5	
17	Ms.	Grimaldo	Jeanine	K	12-Nov-70	4	
18	Mr.	Rosenberg	Andrew	D	24-Jan-71	4	
19	Mr.	Rosten	Peter	F	03-Oct-68	4	
20	Mr.	McKee	Robert	S	06-Mar-70	1	
21	Ms.	Baumann	Jennifer	A	11-Dec-74	3	

Table name: STORE				
STORE_CODE	STORE_NAME	STORE_YTD_SALES	REGION_CODE	EMP_CODE
1	Access Junction	1003455.76	2	8
2	Database Corner	1421967.39	2	12
3	Tuple Charge	986783.22	1	7
4	Attribute Alley	944568.56	2	3
5	Primary Key Point	2930098.45	1	15

Table name: REGION	
REGION_CODE	REGION_DESCRPT
1	East
2	West

Table	Primary Key	Foreign Key(s)
EMPLOYEE	EMP_CODE	STORE_CODE
STORE	STORE_CODE	REGION_CODE
REGION	REGION_CODE	none

19. Using the above diagram, describe the type(s) of relationship(s) between STORE and REGION.

In the Store table, the attribute REGION_CODE has two values which are 1 and 2, and they are being referenced among different Store. In the Region table, there are only 2 values of REGION_CODE that are 1 and 2. The relationship between STORE and REGION is M : 1

20. Using the above diagram, describe the type(s) of relationship(s) between EMPLOYEE and STORE.

The foreign key STORE_CODE located in the EMPLOYEE table. This column has many, which happen to be duplicate, values. Each distinct STORE_VALUE's value is defined in STORE. The relationship between EMPLOYEE and STORE is M : 1.

