

<u>L</u>	1. Conceptual design	A. Each entity has a unique value in a primary key and that the key has no NULL value
<u>K</u>	2. Natural join	B. Cannot be NULL
<u>I</u>	3. Attribute	C. Raw fact that have not been processed
<u>R</u>	4. Composite key	D. Domain, key, foreign key
<u>M</u>	5. Generalization	E. Same data stored unnecessarily at a different location
<u>Q</u>	6. Super key	F. Immunity of external models to changes in the logical model.
<u>E</u>	7. Data redundancy	G. Entities, attributes, relationships, entity sets, relationship sets.
<u>D</u>	8. Entity integrity constraint	H. Number of entity instances to which another entity instance can map under the relationship
<u>N</u>	9. Cross Join	I. A characteristic of the entity or object
<u>S</u>	10. Mini-world	J. Two foreign keys in a relationship table
<u>O</u>	11. Data mining	K. Cartesian product, subject to the equality of the common attribute
<u>C</u>	12. Data	L. Is followed by a logical design
<u>J</u>	13. Many-to-many relationship	M. The grouping of the common attributes in a super class entity
<u>F</u>	14. Logical data independence	N. Cartesian product of two or more tables
<u>G</u>	15. Entity-Relationship Model	O. Discovery of patterns and trends in the data
<u>A</u>	16. Entity integrity	P. <i>Processed data</i>
<u>H</u>	17. Cardinality	Q. Non-minimal key
<u>B</u>	18. Primary key	R. A multiple attribute key
<u>P</u>	19. Information	S. Some part of the real world about which data is stored in a database

Mapping the ER diagram to Relational schemas.
Look at the example on the following site:

<http://www.exploredatabase.com/2016/05/how-to-convert-entity-relationship-diagram-to-relational-schema.html>

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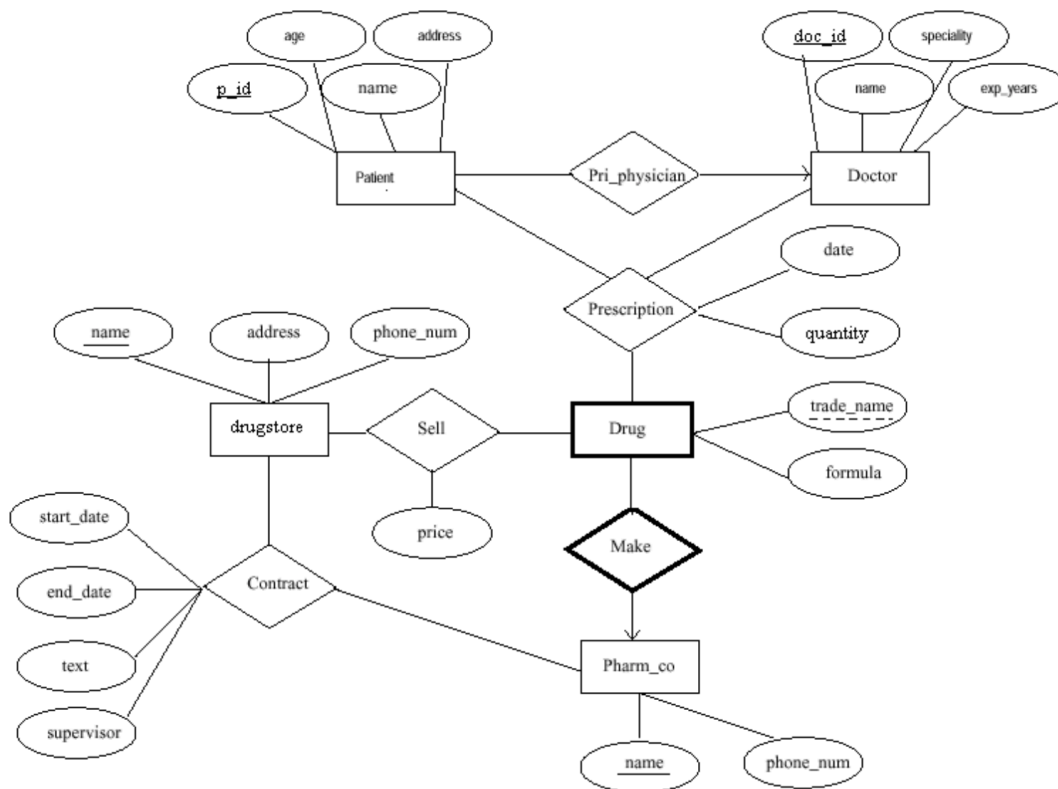
A good example on how drawing ER diagrams and converting ER diagram to relational schema (from http://www2.cs.sfu.ca/CourseCentral/354/louie/Assignment_1_key.pdf)

Suppose you are given the following information about a database for a chain of drug stores:

- a drugstore sells drugs prescribed by doctors to patients,
- each drugstore in the chain is identified by a store name, address, and a phone number,
- patients are identified by a patient id, and their names, addresses, and ages must be recorded,
- doctors are identified by a doctor id. Each doctor's name, specialty, and years of experience must be recorded,
- each drug is made by a pharmaceutical company and sold to the drugstore. The drug's trade name identifies the drug uniquely from among the products of that company. For each drug, the trade name and formula must be recorded
- each pharmaceutical company is identified by name and has a phone number,
- every patient has a primary doctor,
- every doctor has at least one patient,
- each drugstore sells several drugs and has a price for each. A drug could be sold at several drugstores, and the price could vary from one drugstore to another,
- doctors prescribe drugs for patients. A doctor could prescribe one or more drugs for several patients, and a patient could obtain prescriptions from several doctors,
- each prescription has a date and a quantity associated with it. You can assume that if a doctor prescribes the same drug for the same patient more than once, only the last such prescription needs to be stored,
- pharmaceutical companies have long-term contracts with drugstores. A pharmaceutical company can contract with several drugstores, and a drugstore can contract with several pharmaceutical companies. For each contract, you have to store a start date, an end date, and the text of the contract,
- drugstores appoint a supervisor for each contract. There must always be a supervisor for each contract, but the contract supervisor can change over the lifetime of the contract,
- if a pharmaceutical company is deleted, you need not keep track of its products any longer.

- a) (8 marks) Draw an ER diagram that captures the above information and identify any constraints that are not captured by the diagram.

Here is a sample ER diagram. Depending on the assumptions made (which should be clearly stated), other diagrams are possible! Start w. 8 marks and deduct one for each missing entity, attribute, role indicator, cardinality indicator, etc. Note that the attribute names do not have to match exactly. Note that the entity 'drug' is a weak entity set and the relationship set 'make' is also weak, as indicated by the thicker lines in this diagram as opposed to the double lines used in the textbook.



- b) (8 marks) Define the relational schema corresponding to the entity sets and relationship sets. Underline the primary keys.

drugstore(name, address, phone_num)
doctor(doc_id, name, specialty, exp_years)
patient(p_id, name, address, age)
pri_physician(p_id, doc_id)
prescription(p_id, doc_id, date, quantity, trade_name, pharm_name)
drug(pharm_name, trade_name, formula)
sell(store_name, pharm_name, trade_name, price)
contract(store_name, pharm_name, start_date, end_date, text,
supervisor)