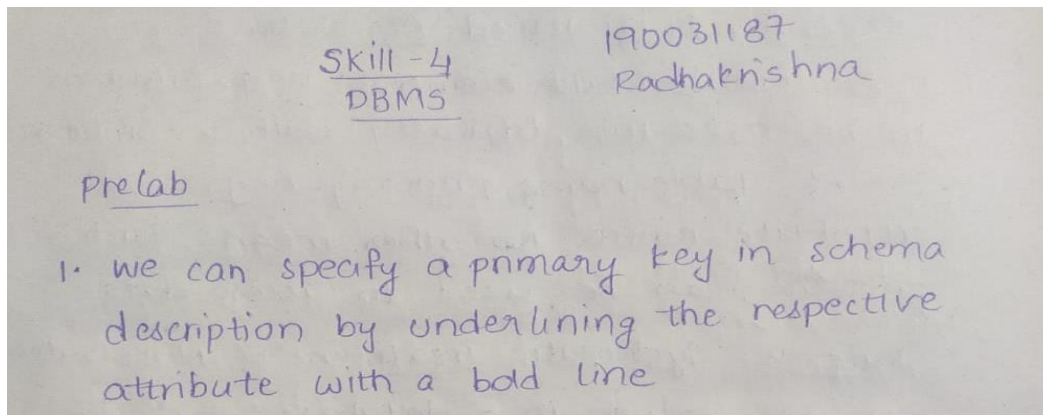
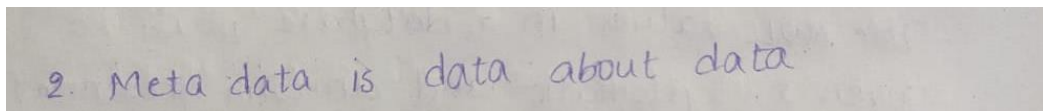


SKILLING-4**PRE-LAB:**

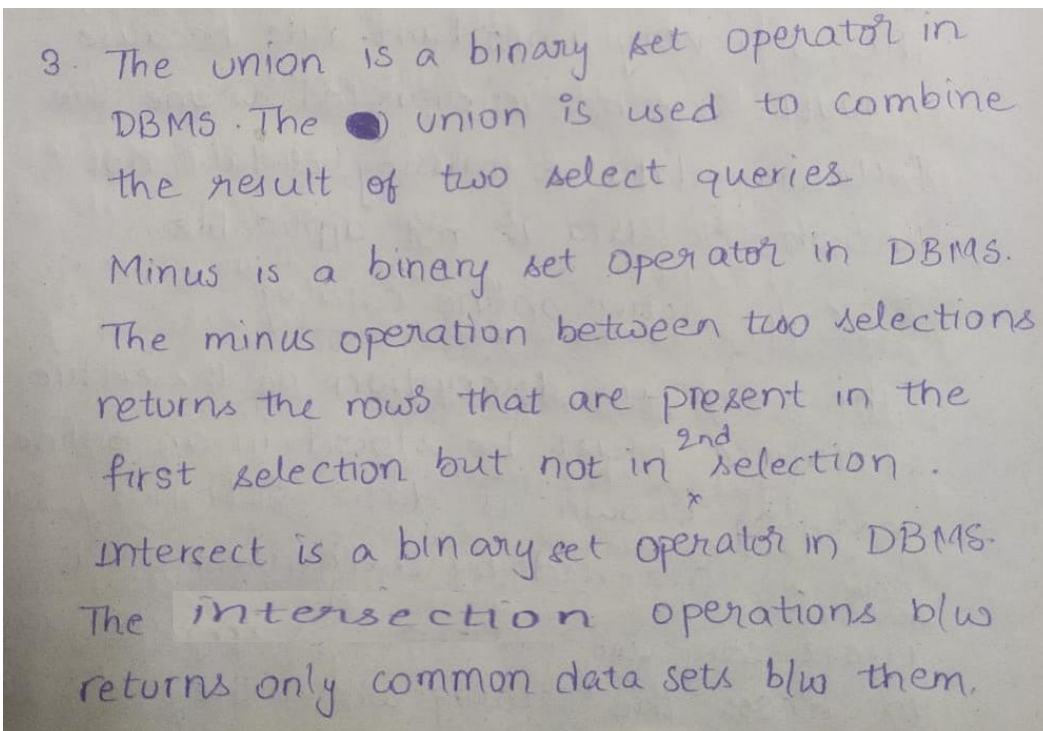
1. What is the method of specifying a primary key in a schema description?



2. What do you mean by metadata?



3. Explain UNION, MINUS and INTERSECT commands?



4. Discuss about 12 Codd rules of Relational Databases.

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4. Rule-1 Information Rule

The data stored in a database, may it be user data or metadata, must be a value of some table cell. Everything in a database must be stored in a table format.

Rule-2 Guaranteed Access Rule

Every single data element is guaranteed to be accessible logically with a combination of table-name, primary-key, and attribute-name. No other means, such as pointers, can be used to access data.

Rule-3 Systematic Treatment of Null values

The Null values in a database must be given a systematic and uniform treatment. This is a very important rule because a NULL can be interpreted as one the following data is missing, data is not known, or data is not applicable.

Rule-4 Active online catalog

The structure description of the entire database must be stored in an online catalog known as data dictionary, which can be accessed by authorized users.

Users can use the same query language to access the catalog which they use to

access the database itself

Rule-5 Comprehensive Data Sub-language Rule

A database can only be accessed using a language having linear syntax that supports data definition, data manipulation and transaction management operations. This language can be used directly or by means of some application. If the database allow access to data without any help of this language, then it is considered as a violation.

Rule-6 View updating Rule

All the views of a database, which can theoretically be updated, must also be updatable by the system.

Rule-7 High Level Insert, update, Delete Rule

A database must support high-level insertion, updation, and deletion. This must not be limited to single row, that is it must also support union, intersection, and minus operations to yield sets of data records.

Rule-8 Physical Data Independence

The data stored in a database must be independent of the applications that access the database. Any change in the physical

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Structure of a database must not have any impact on how the data is being accessed by external applications.

Rule-9 Logical Data Independence

The logical data in a database must be independent of its users view. Any change in logical data must not affect the applications using it.

Rule-10 Integrity Dependence

A database must be independent of the application that uses it. All the integrity constraints can be independently modified without the need of any change in the application. It makes a database independent of front end application and its interface.

Rule-11 Distribution Independence

The end user must not be able to see the data is distributed over various locations. Users should always get the impression that data is located at one site only.

Rule-12 Non Subversion Rule

If a system has an interface that provides access to low-level records then interface must not be able to subvert the system and bypass security and integrity constraints.

5. What is Relational Algebra?

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5. What is Relational Algebra?

Relational Algebra is a procedural query language, which takes instances of relation as inputs and yields instances of relations as output. It uses operators to perform queries.

INLAB

Draw an ER Diagram for a given

**Case Study 9 (MILITARY DATABASE) CASE STUDY 9:
MILITARY DATABASE**

To diminish the national defense expenditure and increment the war making capacity, the Indian military needs a computerized administration data framework staff the board. So, the Military chief's group have approached you to make a database. To assist you with this they gave you the accompanying information sources. The sources of info are as archives and records. Those records and Files can help you in getting knowledge into how their information can be put away, oversaw and recovered.

INDIAN Military has Different Divisions in it. It has:

- 1) Army
- 2) Navy
- 3) Air Force

They likewise have a Special Science Division Which Designs and Manufactures various kinds of weapons, Warships, Heli-carriers and Fighter planes.

Armed force: An enormous sorted out group of equipped work force prepared for war particularly ashore. The officer's ought to have explicit range of abilities to be in the military, they get the valor and respect dependent on their missions, battle aptitudes in serving the country and as indicated by their positions.

Naval force: The military arm of the country's sea armada, the Indian Navy, watches the seas so as to guard them. A common navy sending includes a few or more ships, submarines and maritime airplane squadrons taking part in exercises intended to guard the country.

Flying corps: The Air Force centers around flying, yet just a little division of work force really fly. Most aviators and airwomen deal with flight missions, taking care of base undertakings, securing bases, developing new airstrips, guarding rocket destinations, in any event, doing salvages.

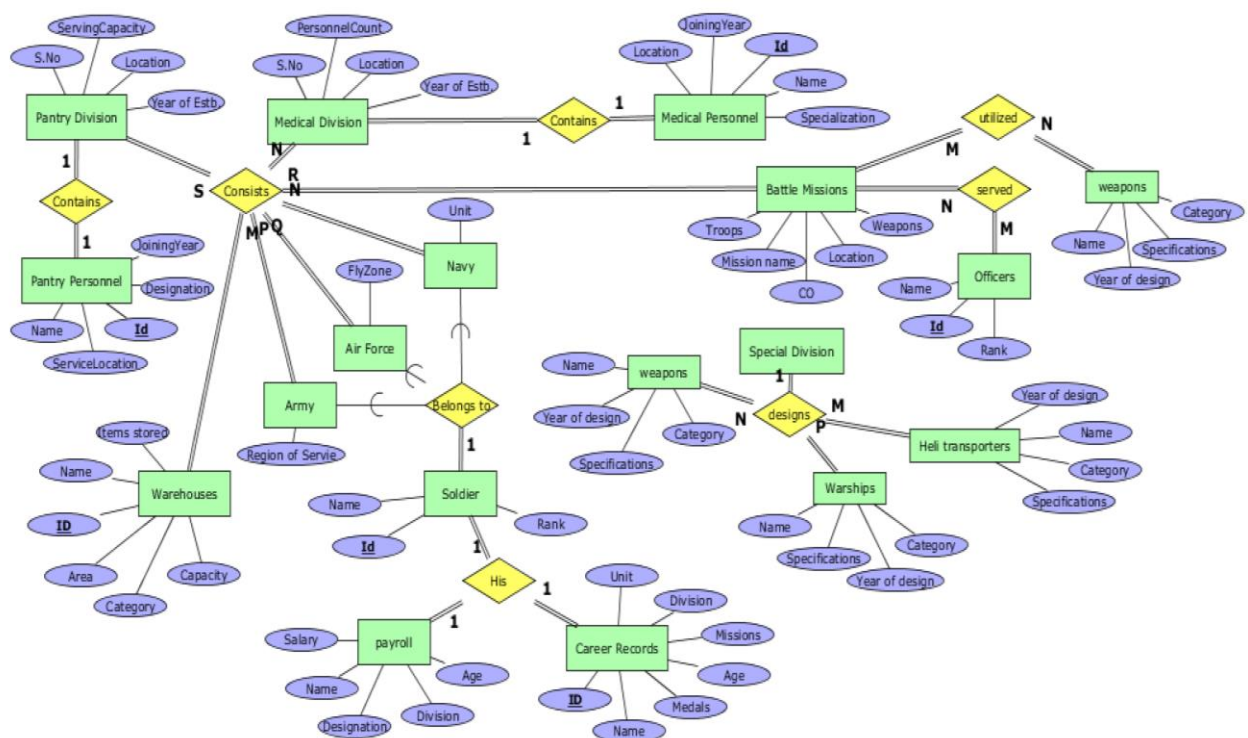
The Database should also be included with the Soldiers personal details in the different divisions of Army (which contains Name, ID, Rank, Region of Service), Navy (Which contains Name, ID, Rank, Unit) and Flying Corps (Which contains Name, ID, Rank, Fly zone). The Army and the aviation based armed forces in some cases structures joint task force to work some Covert missions and stealth battle missions as does the Navy and Marines. The Military boss needs the details of the battle missions to be gotten to effectively in the database, the database contains the details for example: Mission name, Location, troops, CO (Commanding Officer), weapons. The battle missions additionally contain the officers served in it and the weapons utilized in it.

The group likewise needs to get to the worker information who works in the science division. The unique Science Division Makes the Weapons which are utilized in various Parts of the military, it makes strategic weapons, Warships which are utilized in naval force, Heli- transporters, the group Wants to store details of the weapons, for example: Name, Specifications, Category, Year of Design and ought to do likewise with Warships, Heli- carriers, Fighter planes.

The military keeps up Warehouses and weapon depots to store the weapons and the Equipment of the Military Personnel in better places, it gets hard to store this information in the structure documents, so the Military wants to Computerize this. He needs to store the details like Name of the stockroom ID, area of it, Category, Items stored, holding capacity.

The team also wants to modernize the Payroll details (Which contains the details like Name, Division, Designation, Age, Salary) of the officers and their Career record (Which contains the details like ID, Rank, Unit, Division, Age, Missions, Medals) in the data base. The Military also has the pantry division, the data base should contain the details such as S.no, location, Year of Establishment, Serving capacity. He also wants to computerize the details of pantry personnel like Name, ID, Designation, Joining year, Location of service. Another important Military division which is very essential is the Medical division it is the place where the wounded and the soldiers with extreme medical condition are healed, this data base should also include the details of Medical installations such as S.no, location, Year of Establishment, personnel count and also the information of Medical personnel which should include Name, ID, Joining year, specialization, Location.

The information provided by the Military team may not be complete and unambiguous. Please make necessary assumptions and create a first draft of the design of a data recording, maintaining and retrieval model.



POST LAB

1. Discuss how to convert an ER diagram into a Relational model.

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1. Rule-1 For strong entity set with only simple Attributes

It will require only one table in relational model. Attributes of the table will be the attributes of the entity set

Primary key of the table will be primary key of entity set

- Rule-2 For strong entity set with composite Attributes.

It will require only one table in relational model. while conversion, simple attributes of the composite attributes are taken into account and not composite attribute itself.

- Rule-3: For strong Entity set with Multi Valued Attributes.

A strong entity set with any no. of multi valued attributes will require two tables in relational model. one table will contain all the simple attributes with the primary key. other table will contain the primary key and all the multi valued attributes.

Rule-4 :- Translating Relationship set into a Table

It will require one table in the relational model.

Attributes of the table are :-

primary key attributes of the participating entity sets.

Its own descriptive attributes if any
Set of non-descriptive attributes will be primary key

Rule-5 :- For Binary Relationships with Cardinality Ratios.

following four cases are possible:-

Case-1 :- Binary Relationship with cardinality ratio $m:n$

Case-2 Binary relationship with cardinality ratio $1:n$

Case-3 Binary relationship with cardinality ratio $m:1$

Case-4 :- Binary relationship with cardinality ratio $1:1$

Rule-6 For Binary Relationship with both cardinality and participation constraints

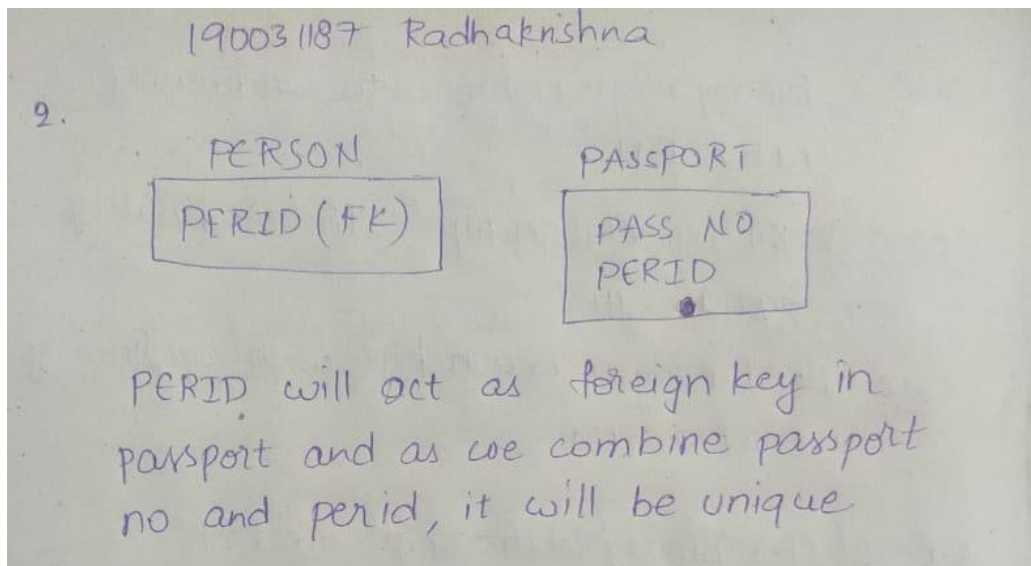
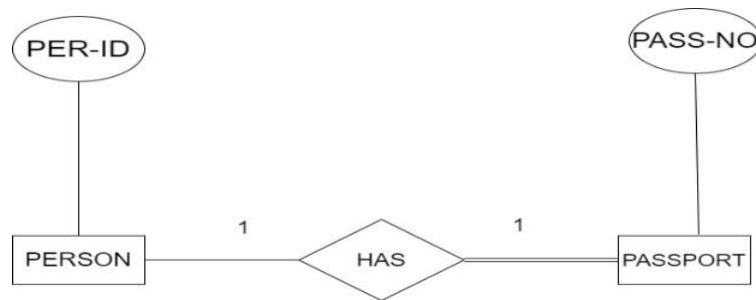
cardinality constraints will be implemented as discussed in Rule-5

Because of Total participation constraint, foreign key acquires NOT NULL constraint, i.e. now foreign key cannot be NULL

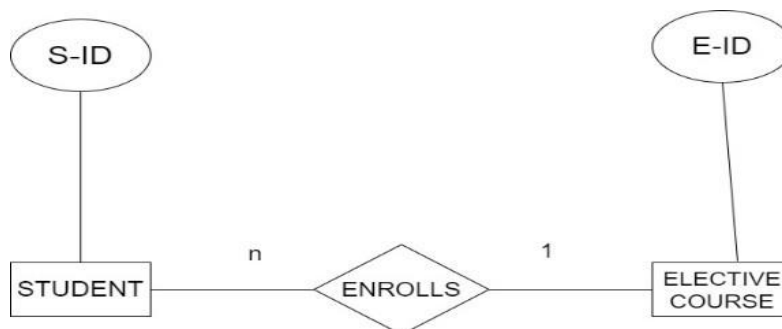
Rule-7 For Binary Relationship with weak entity

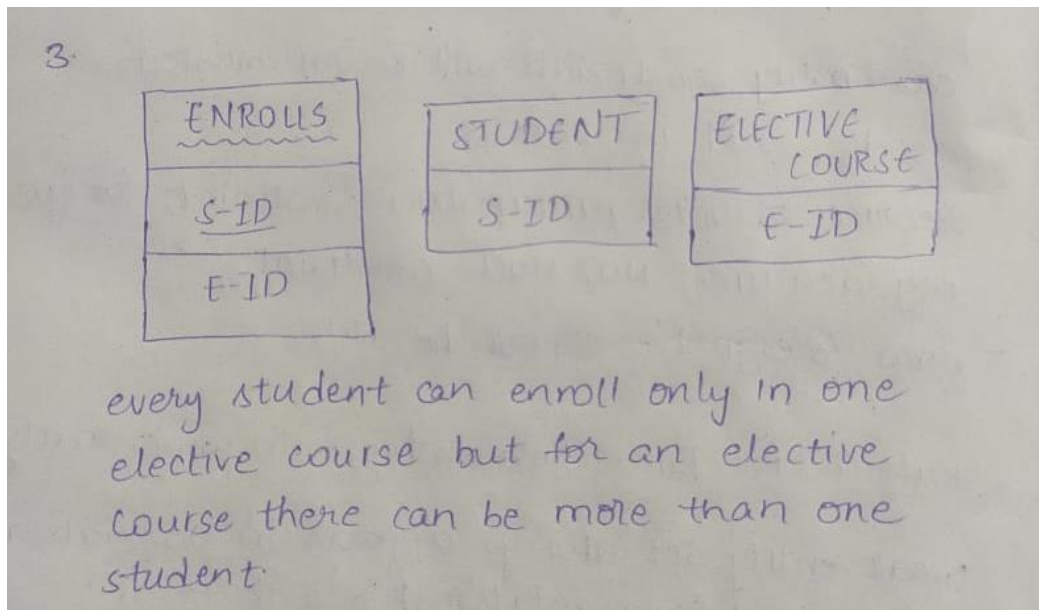
weak entity set always appears in association with identifying relationship with total participation constraint.

2. From the ER model given below, we can say that it is a 1:1 cardinality with total participation constraint from Passport. Firstly, convert the diagram into a Relational model and then explain.

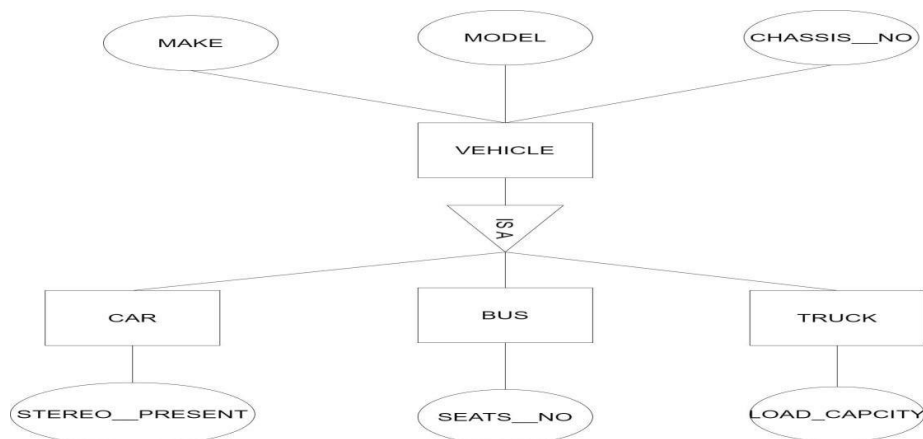


3. From the given ER model, we can say that it is an N:1 cardinality. Firstly, convert the diagram into a Relational model and then explain.





4. In regard with the below specified ER diagram, state to which domain does it related to: generalization or specialization and briefly state about overlapping specialization and disjoint specialization?



4. It is a specialization.
 In a disjoint specialization, an individual of a parent class may be a member of only one specialized subclass.
 In an overlapping specialization, an individual of the parent class may be a member of more than one of the specialized subclasses.

5. How does Tuple-oriented relational calculus differ from domain-oriented relational calculus?

5-

Tuple Relational calculus TRC	Domain Relational calculus DRC
<p>In TRC, the variables represent the tuples from specified relation</p>	<p>In DRC the variables represent the value drawn from specified relation.</p>
<p>A tuple is a single element of relation in dataterm, it is called a row</p>	<p>A domain is equivalent to column datatype and any constraints on value of data</p>
<p>In this filtering variable uses tuple of relation</p>	<p>In this filtering is done based on the domain of attributes.</p>
<p><u>Notation</u> $\{T \mid P(T)\}$ or $\{T \mid \text{condition}(T)\}$ </p>	<p><u>Notation</u> $\{a_1, a_2, \dots, a_n \mid P(a_1, a_2, \dots, a_n)\}$ </p>
<p><u>Example</u> $\{T \mid \text{EMPLOYEE}(T) \text{ AND } T.\text{DEPT_ID} = 10\}$ </p>	<p><u>Example</u> $\{I \mid \langle \text{EMPLOYEE} \rangle \text{DEPT_ID} = 10\}$ </p>