



**GALGOTIAS**  
UNIVERSITY

## **School of Computing Science and Engineering**

Program: BCA

Course Code: BCAC2102

Course Name: Database Management System

Lecture-13

Topic- Queries

Faculty:-Dr. Satyajee Srivastava

# Lecture-12(RECAP)

## Lecture 12

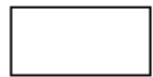
### Topic-ER-Diagram

## Lecture-12

### ER-DIAGRAM:

The overall logical structure of a database using ER-model graphically with the help of an ER-diagram.

#### Symbols use ER- diagram:



entity



Weak entity



attribute



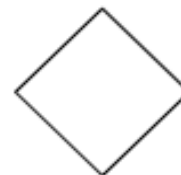
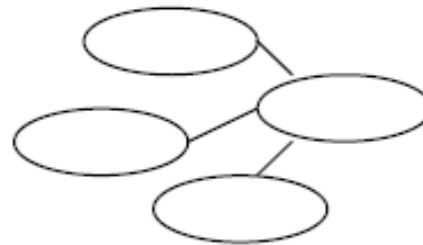
Multi valued attribute



Derived attribute



Key attribute



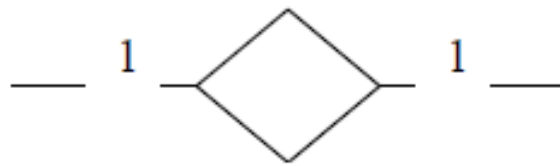
composite attribute

Relationship

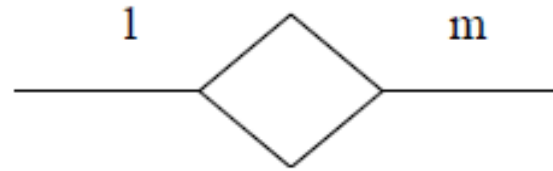


Identifying  
Relationship

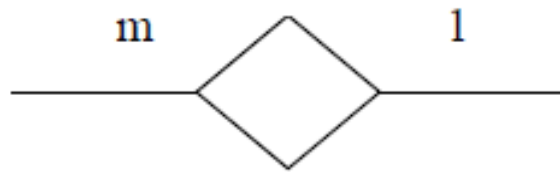
## Lecture-12



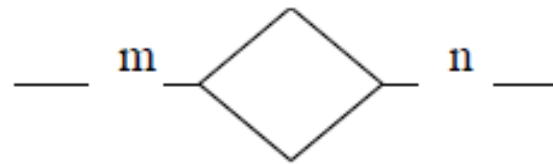
One-to -one



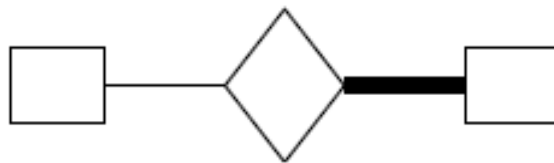
One-to -many



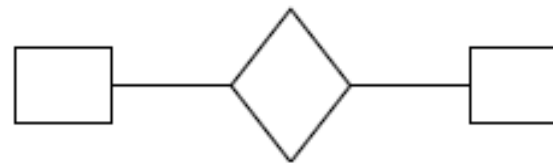
many-to -one



many-to -many

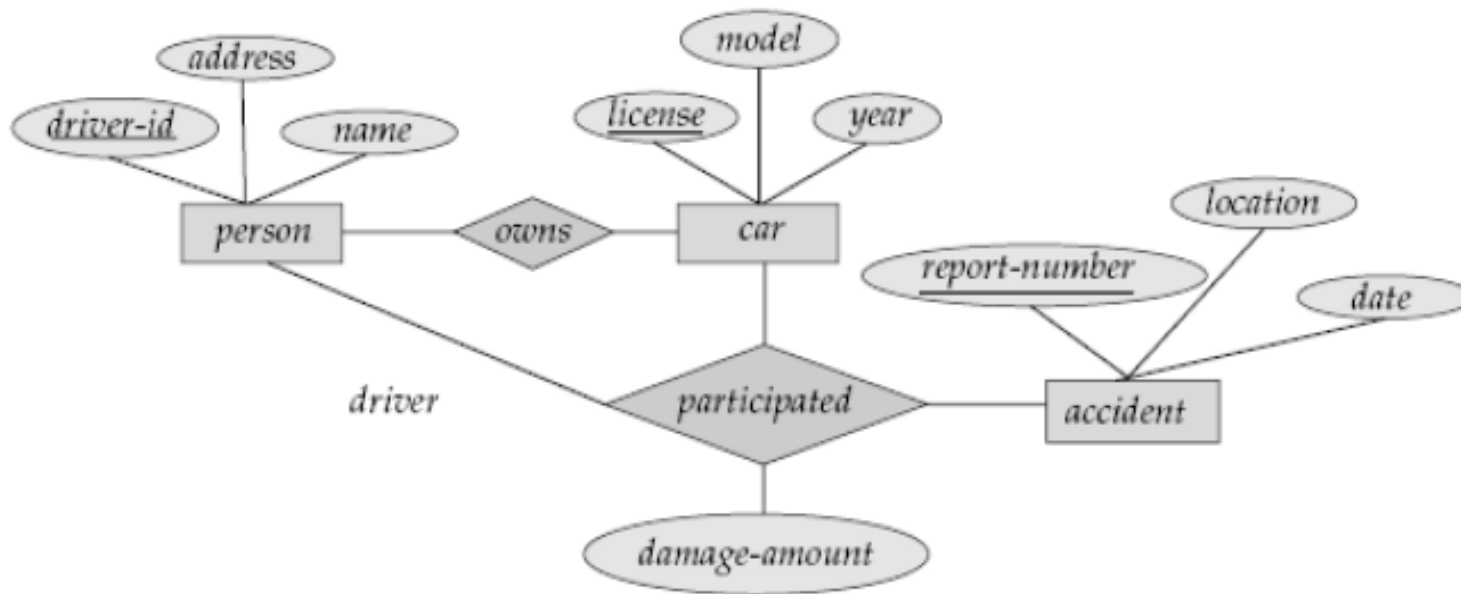


Total participation



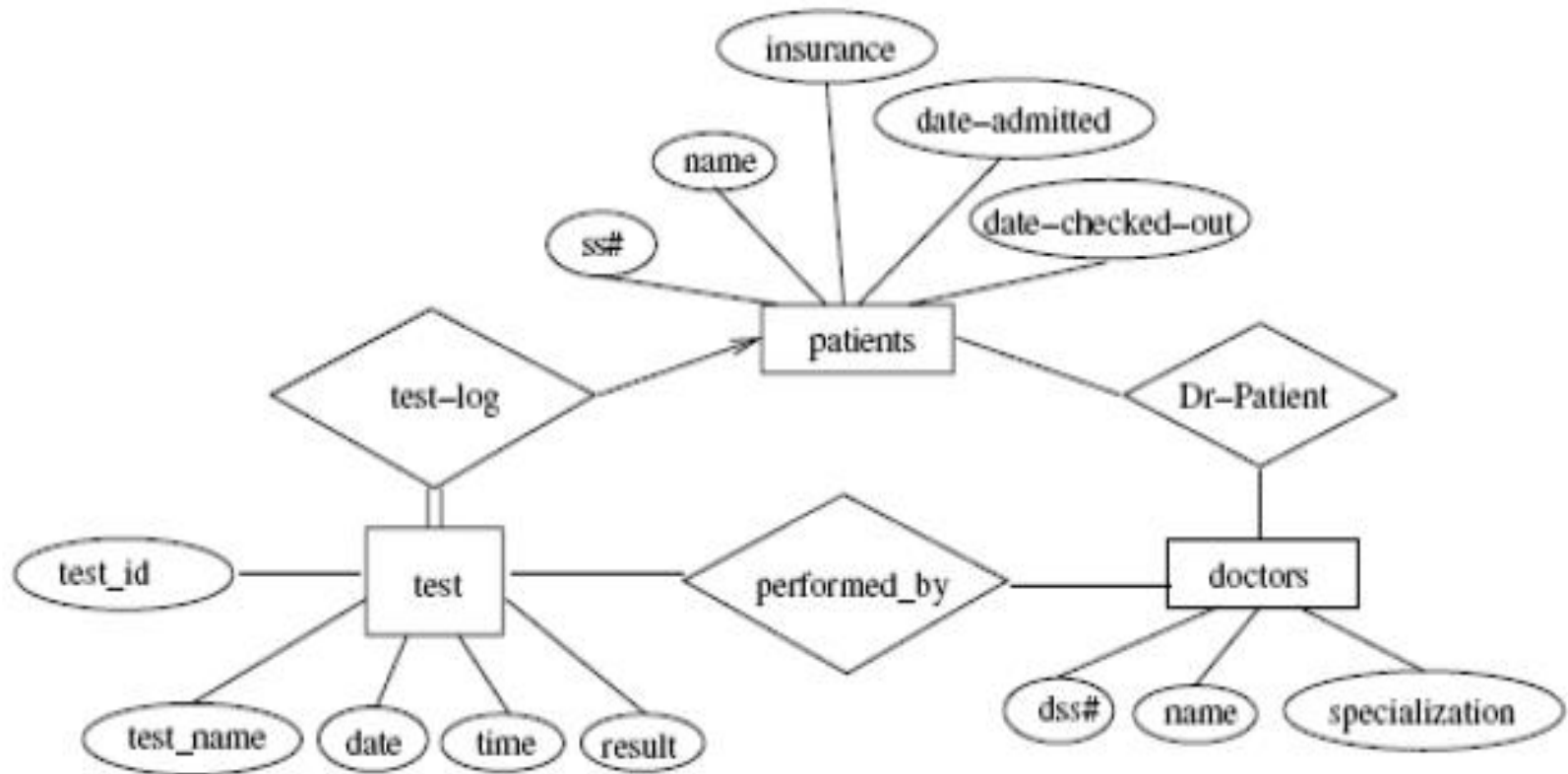
Partial participation

## Lecture-12

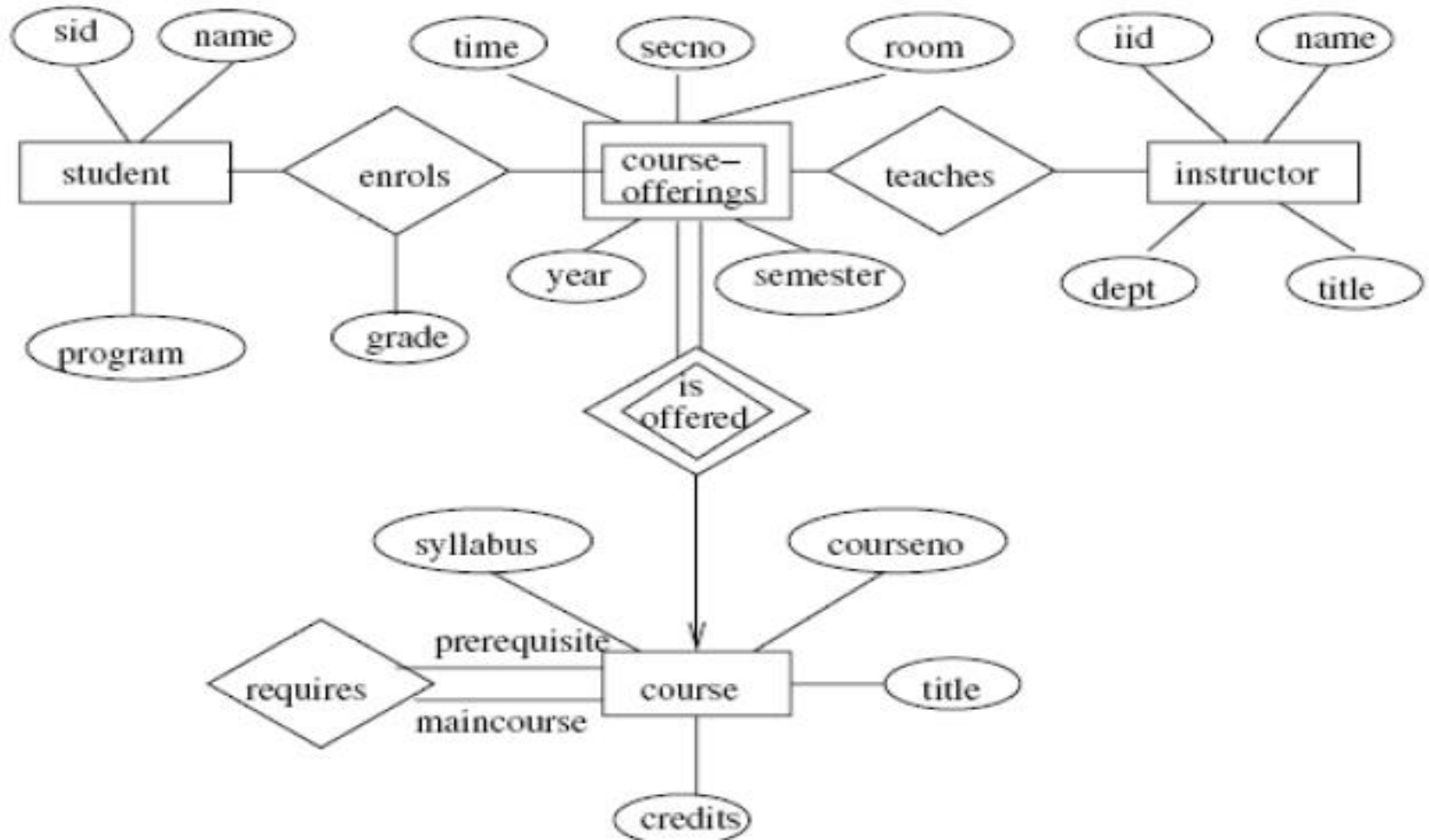


E-R diagram for a Car-insurance company.

## Lecture-12



**E-R diagram for a hospital.**



E-R diagram for a university.

## **Lecture-13**

**Topic- Queries**

**Objective :**

**Understand Queries and How To write Queries?**



## Lecture-13

### Database Basics:

#### **Data item:**

The data item is also called as field in data processing and is the smallest unit of data that has meaning to its users.

Eg: "e101", "sumit"

#### **Entities and attributes:**

An entity is a thing or object in the real world that is distinguishable from all other objects

Eg:

Bank, employee, student

Attributes are properties are properties of an entity.

Eg:

Empcode, ename, rolno, name

## Lecture-13

### Database language :

#### 1) Data definition language(DDL) :

DDL is used to define database objects .The conceptual schema is specified by a set of definitions expressed by this language. It also give some details about how to implement this schema in the physical devices used to store the data. This definition includes all the entity sets and their associated attributes and their relation ships. The result of DDL statements will be a set of tables that are stored in special file called data dictionary.

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### 2) Data manipulation language(DML) :

A DML is a language that enables users to access or manipulate data stored in the database. Data manipulation involves retrieval of data from the database, insertion of new data into the database and deletion of data or modification of existing data.

There are basically two types of DML:

- **procedural:** Which requires a user to specify what data is needed and how to get it.
- **non-rocedural:** which requires a user to specify what data is needed with out specifying how to get it.

### 3) Data control language(DCL):

This language enables user to grant authorization and canceling authorization of database objects.

# Lecture-13

## Lecture-14

# Data Definition Language (DDL) :

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- ❖ In most of our discussions concerning SQL and relational databases, we have accepted a set of relations as given.
- ❖ Of course, the set of relations in a database must be specified to the system by means of a data definition language (DDL).
- ❖ The SQL DDL allows the specification of not only a set of relations but also information about each relation, including :
  - The scheme for each relation.
  - The domain of values associated with each attribute.
  - The set of indices to be maintained for each relation.
  - Security and authorization information for each relation.
  - Integrity constraints.
  - The physical storage structure of each relation on disk.

## 1. Create command :

- An SQL relation is defined using the **create table** command:

Create table  $r (A_1 D_1, A_2 D_2, A_n D_n)$

- Where  $r$  is the name of the relation, each  $A_i$  is the name of an attribute in the scheme of relation  $r$ , and  $D_i$  is the data type of values in the domain of attribute  $A_i$ .
- The **create table** command also includes options to specify certain integrity constraints. We discuss domain types and integrity constraints.
- A newly created relation is empty initially.
- The **insert** command can be used to load data into the relation. Many relational database products have special bulk loader utilities to load an initial set of tuples into a relation.

- To remove a relation from an SQL database, we use the drop table command. The drop table command deletes all information about the dropped relation from the database.
- The command  
**drop table r**  
is a more drastic action than  
**delete r**
  - The latter retains relation r, but deletes all tuples in r.
  - The former deletes not only all tuples of r but also the scheme for r. After r is dropped, no tuples can be inserted into r unless it is re-created using the **create table** command.
  - Create command can be used for specifying constraints on the table:



- For example Create table student

( roll\_no integer,

Constraint pk\_rollno Primary key roll\_no,

Constraint fk\_con Foreign key dept\_id references Department(dept\_id)

)

## 2. Alter table command :

- The alter table command is used to add attributes to an existing relation. All tuples in the relation are assigned null as the value for the new attribute.
- The form of the alter table command is –

**alter table r Add A D**

Where r is the name of an existing relation, A is the name of the attribute to be added, and D is the domain of the added attribute.

- The alter command appears in some SQL versions, including IBM SAA-SQL, but not in the SQL standard.

- Other commands are as follows :
  - i) Create index : Used to create index on a column typically that is primary key
  - ii) Drop index : Destroys index
  - iii) Create view : Used to create view
  - iv) Drop view : Used to drop view
  - v) Create schema : Used to create the portion of a database that user owns.

### 3. DROP statement in SQL :

- To remove a relation from an SQL database, we use the DROP table command. The DROP command deletes all the information about dropped relation from the database.

**DROP table r**

- Similarly DROP command can be used to drop an index and view.

**DROP view view-name**

**DROP index index-name**

**DROP constraint constraint\_name**



## Modification of Database using Data Manipulation Language (DML)

- ❖ The SQL DML includes a query language based on both the relational algebra and the tuple relational calculus.
- ❖ It includes also commands to insert, delete, and modify tuples in the database.
- ❖ Various DML commands available in SQL are :
  1. SELECT
  2. INSERT
  3. UPDATE
  4. DELETE

## INSERT Statement in SQL

Insert statement is used to insert a row/tuple in a table/ relation.

Suppose we wish to insert the fact about a student then we can write :

```
INSERT into Student values( 1, "Prashant", "Pune");
```

- ❖ This will add a row in a student table with student Roll number 1, name of student Prashant living in Pune.
- ❖ In above example, the values are specified in the order in which the corresponding attributes appear in relation schema.
- ❖ For benefit of users who may not remember the order of the attributes, SQL allows the attributes to be specified as part of insert statement.

```
INSERT into Student (Name, Address, Roll_no)
```

```
Values ("Prashant", "Pune", 1)
```

## **DELETE Statement in SQL :**

- ✧ A delete request is expressed in much the same way as a query. We may delete only whole tuples; we can not delete values on only particular attributes. In SQL deletion is expressed by

**Delete r where p**

- ✧ Where p represents a predicate and r represents a relation. Delete operates only on one relation.

**Delete r**

- ✧ This will delete all the rows from r.

**Delete from Student where Roll\_no = 1**

- ✧ This query will delete a record of a student whose roll\_no is 1.

## UPDATE Statement in SQL :

- ✧ In certain situation we may wish to change a value in a tuple without changing all values in the tuple. For this purpose Update statement can be used.

**UPDATE deposit SET balance = balance\*1.05**

- ✧ The above statement is applied for each tuple in deposit. Balance is increased by 5% for all the accounts.

- ✧ Now let us suppose that accounts with balances over 10000 receive 6 percent interest, while all other receives 5%.

**UPDATE deposit SET balance=balance\*1.06 where balance >10000.**

**UPDATE deposit SET balance=balance\*1.05 where balance < =10000.**



## Lecture-13

### (Assignment)

1. Explain the statement ‘Projection operation distributes over the union operation’. Give an example.

**Note : Create Oracle Account :-**

<https://login.oracle.com/mysso/signon.jsp>

Then

<https://livesql.oracle.com/>



Thank You