



Chhatrapati Shahu Maharaj Shikshan Sanstha's

CHH. SHAHU COLLEGE OF ENGINEERING

Kanchanwadi, Paithan Road, Aurangabad.

Date:

Practical NO: 1.

Aim:- Design schema for college management system.

Theory:-

Relational Model can represent as a table with columns & rows. Each row known as a tuple. Each table of the column has a name or attribute.

Domain :- It contains a set of atomic values that an attribute can take.

Attribute:- It contains the name of a column in a particular table. Each attribute A_i must have a domain $D(A_i)$.

Relational instance:- In the relational database system, the relational instance is represented by a finite set of tuples. Relation instances do not have duplicates tuples.

Relational schema:- A relational schema contains the name of the relation & name of all columns or attributes.

Relational key :- In relational key, each row has one or more attributes. It can identify the row in the relation uniquely.



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ex. Student relation -

Name	Roll No	Phone-no	Address	Age
Ram	14795	7305758992	Noida	24
Shyam	12839	90 26288936	Delhi	35
Lakshman	33289	8583287182	Gurgaon	20
Mahesh	27857	9028913988	Delhi	27
				40

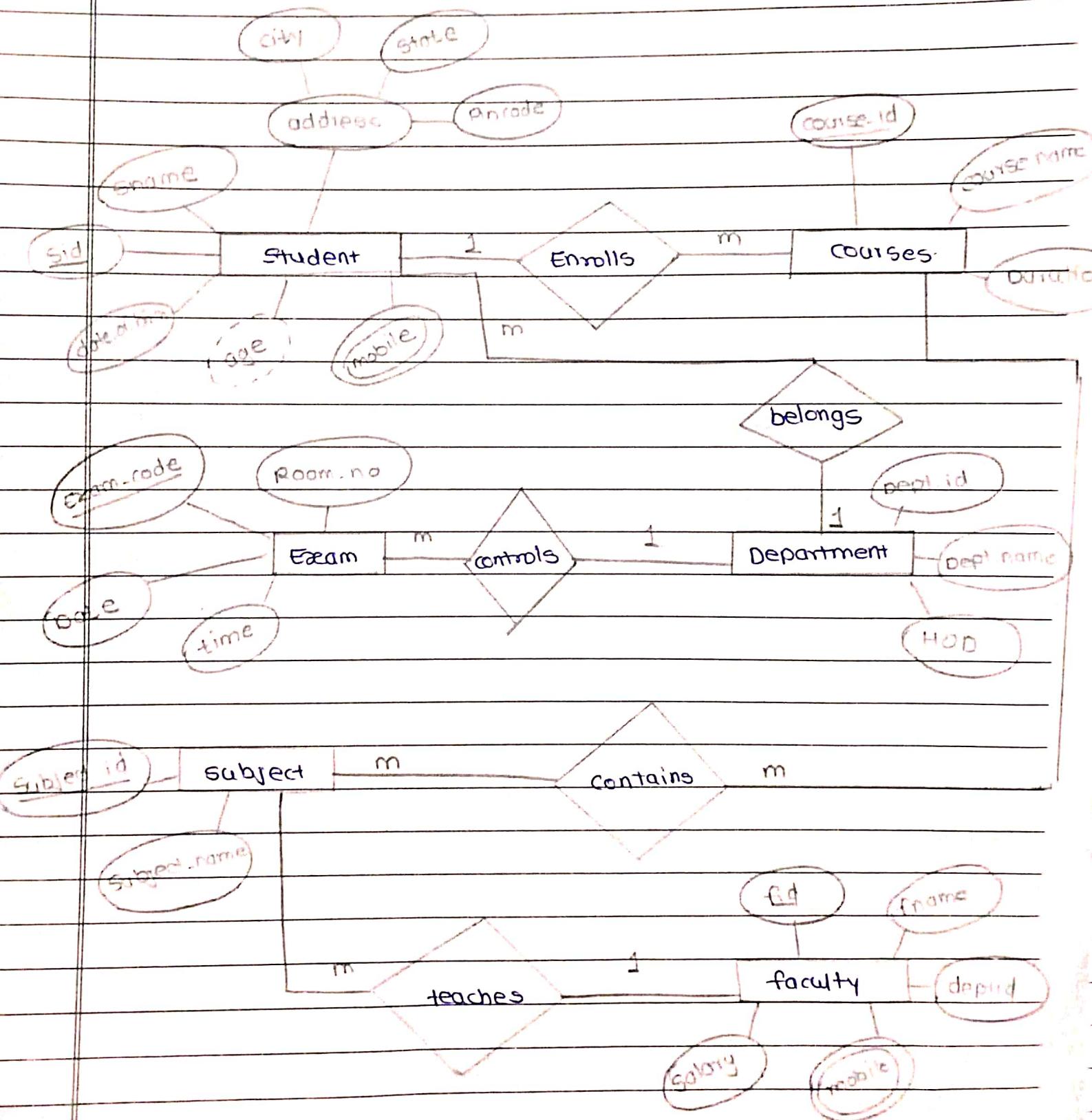
- In above table NAME, ROLL NO, PHONE NO, ADDRESS, Age are attributes.
- The instance of schema student has 5 tuples.

Properties of Relations:-

- Name of the relation is distinct from all other relation
- Each relation cell contains exactly one atomic value
- Each attribute contains a distinct name
- tuples has no duplicate value
- order of tuple can have different sequence.
- Attribute domain has no significance.



E-R Diagram for college Management system:-





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Practical NO :- 2

Aim:- Creating table, Renaming tables, Data constraints (primary key, foreign key, Not Null) Data insertion into a table.

Theory:-

SQL languages:-

DDL:- Data Definition Language provides commands for defining the relational schema, deleting, modifying relational schema.

QML:- It provides ability to query information from the database & insert tuples, delete tuples & modify tuples in Database.

Create Command:-

Create command is used to create database or table.

Syntax:- Create database name of Database.

e.g - Create database college

Create table:-

Syntax:-



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Create Table

table name (col1 datatype, col2 datatype
(integrity constraints))

e.g.

Create Table Student (sid int, sname varchar(30),
state varchar(30), city varchar(30), pin int,
age int, dob Date), primary key(sid);

Output:-

sid	sname	state	city	pin	age	dob
-----	-------	-------	------	-----	-----	-----

ALTER:-

Alter table command is used to add, modify,
drop the column in existing table.

1] Add:-

Syntax -

alter table table name add (col1 datatype...)

ex :-

alter table Student add (deptid int)

2] Modify:- It used to modify the datatypes

Syntax:-

alter table table name modify col1 name datatype

Eg:-

alter table Student state modify State varchar(50)

**3] Drop**

The drop statement is used to delete a table definition & all data from a table.

Syntax:-

alter table table_name drop column colⁿ name;

ex:-

alter table student drop column deptid;

4] RENAME :-

Any database user can easily change the name by using the rename table and alter table statement in structured query language.

Syntax:-

Rename old_table_name To new_table_name;

ex:-

Rename Cars To Car_2021_Details;

INSERT:-

Insert command is data manipulation command that used to manipulate data by inserting information into the tables.

Syntax:-

Insert into table_name (col1, col2, ..., coln)
 values (value1, value2, ..., valuen).

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Update:-

Update command is a data manipulation command which is used to edit the records of a table.

Syntax:-

Update table_name set col1 = value1 , col2 = value2
where condition;

Ex:-

Update student set deptid=3 where sid=3.

Delete:-

Delete statement used to delete existing records in a table.

Syntax:-

Delete from table-name Where condition;

Ex:-

Delete from student where sid=4.



Practical NO: 4

Aim:- Implementing SQL Commands for Sub-queries
Set operations, Joins

Theory:-

SQL Operators:

ALL :-

The ALL operator:-

- return a boolean value as a result
 - returns True if ALL of the subquery value meet the condition.
 - Is used with Select, Where and Having statements
- ALL means that the condition will be true only if the operation is true for all values in the range.

Syntax:-

```
Select All column-name(s)  
from tablename Where condition;
```

With Where clause:-

```
Select column-name(s) from tablename Where  
Column-name Operator ALL (Select column-name  
from tablename Where condition);
```

e.g:-

```
Select All productName FROM product Where  
TRUE;
```



The SQL ANY clause:-

The ANY operator:-

- returns a boolean value as a result
- returns TRUE if ANY of the subquery values meet the condition.

Syntax:-

Select column_name(s) from table-name where
Column_name operator ANY (Select column_name FROM
table-name where condition);

Ex:-

Select ProductName from products where
productIn = ANY (Select productIn from OrderDetails
where quantity = 10);

AND :-

This operator display only those records where both the condition condition1 & condition2 evaluate as true.

Syntax:-

Select * from table-name where condition1 AND
condition2

OR operator:-

This operator Display the records where either one of the conditions condition1 & condition2 evaluate true. That is, either condition1 is True condition2 is true.



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Syntax:-

Select * from table-name where condition1 OR
Condition2

Ex:-

Select * from Student where age = 18 OR
Address = 'Delhi'

NOT:-

NOT is logical operator in SQL that you can put before any conditional statement to select rows for which that statement is false.

Syntax:-

Select column1, column2 from table-name
where NOT Condition;

Ex:-

Select * from customer where not country = 'UK';

Between:-

The between operator selects value within a given range. The value can be numbers, text or dates.

Syntax:-

Select column name(s) from table name
where column name between value1 AND value2;

Ex:-

Select * from products where price
between 10 AND 20;

**Exists :-**

The Exists operator used to test for the existence of any record in a Subquery.

The exists operator return true if the subquery returns one or more records.

Syntax:-

Select column name(s) from table name where exists (select column name from table name where condition);

e.g. - Select fname, lname from customer
where exists (select * from orders where
customers.customer-id = orders.c_id);

SQL JOIN :-

In SQL Join clause is used to combine the records from two or more tables in database.

Types of Join**II Inner Join:-**

In SQL inner join selects records that have matching value in both tables as long as the condition is satisfied. It returns the combination of all rows from both the tables where the condition satisfies.

Syntax:-

select table1.column1, table1.column2, table2.column1,



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From table1 INNER JOIN table2

ON table1.matching column = table2.matching column;

Example:-

```
Select Employee.Ename, Project.dept from employee  
inner join Project ON Project.empid=employee.empid
```

LEFT JOIN:-

The SQL left Join returns all the values from left table & the matching values from the right table. If there is no matching join value, it will return NULL.

Syntax:-

```
Select table1.column1, table1.column2, table2.column1,  
from table1  
LEFT JOIN table2  
ON table1.matching column = table2.matching column;
```

Example:-

```
Select employee.Ename, Project.dept from employee  
LEFT JOIN Project ON  
Project.empid = employee.empid;
```

RIGHT JOIN:-

In SQL, Right join returns all the values from the values from the rows of right table & the matched value from the left table. If there is no matching in both tables, it will return NULL.



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Syntax:-

```
Select table1. column1, table1. column2, table2. column1  
from table1
```

RIGHT JOIN table2

```
ON table1.matching-column = table2.matching-column;
```

Example:-

```
Select employee.ename, project.dept from employee  
RIGHT JOIN Project ON Project.empid=employee.empid
```

FULL JOIN:-

In SQL, FULL JOIN is the result of combination of both left & right outer join. Join tables have all records from both tables. It puts NULL on the place of matches not found.

Syntax:-

```
Select table1. column1, table1. column2, table2. column1  
from table1
```

FULL JOIN table2

```
ON table1.matching-column = table2.matching-column;
```

Example:-

```
Select employee.empname, project.dept from  
employee full Join project ON project.empid=  
employee.empid.
```



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SQl SET operators:-

Set operators are special type of operators which are used to combine the result of two queries.

1. UNION operator:-

1) Union will be used to combine the result of two select statements

2) Duplicates rows will be eliminated from the result obtained after performing UNION operator.

Query:

```
MySQL select * from t1.employee UNION select  
* from t2.employees;
```

Syntax:-

```
select column_name from table1 Union  
Select column_name from table2;
```

2. Union All

Union all operation is equal to the union operation. It returns the set without removing duplication & sorting the data.

Syntax:

```
Select column_name from table1 Union All  
Select column_name from table2;
```



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Ex.

Select * from A UNION ALL Select * from B;

3. Intersect:

- 1) It is used to combine two select statements.
- 2) The intersect operation returns the common rows from both select statements.
- 3) The number of datatypes & column must be same for intersection.
- 4) It has no duplicates & arrange the data in ascending order by default.

Syntax:-

Select column name from table1

INTERSECT

Select column name from table2.

Ex.

Select * from A

INTERSECT

Select * from B

4. Minus

It combines the result of two select statements. Minus operator is used to display the rows which are present in the first query but absent in second query.



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Syntax:-

selected column name from Table 1

MINUS

selected column name from Table 2.

Cx

Select * from A

MINUS

Select * from B



Bactical NO: 5.

Aim:- Implementing SQL commands for triggers

Theory:-

SQL Triggers:-

A trigger in Structured Query language is a set of procedural statements which are executed automatically where there is any response to certain events on the particular table in the database.

In Structured Query language, triggers are called only either before or after the below events.

1) INSERT EVENTS:-

This event is called when the new row is entered in the table.

2) Update Event:- This event is called when the existing record is changed or modified in the table.

3) Delete Event:- This Event is called when the existing record is removed from the table.

Types of Trigger:

1. After insert Trigger:- This trigger is invoked after the insertion of data in the table.



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2. After update Trigger:-

This trigger is invoked in SQL after the modification of the data in the table.

3. After delete trigger:-

This trigger is invoked after deleting the data from the table.

4. Before insert Trigger:-

This trigger is invoked before inserting record in table.

5. Before update Trigger:-

This trigger is invoked before updating the record in the table.

6. Before delete Trigger:-

This trigger is invoked before deleting the record from the table.

OML Triggers :-

This triggers are automatically fired when an INSERT, UPDATE or DELETE event occurs on table.

Create Trigger:-

create Trigger [schema_name.] ON [table_name]
view_name? {FOR|AFTER|INSTEAD OF? [NOT FOR
REPLICATION]} AS {SQL statements?}



Schema name - (optional) is the name of Schema where the new trigger will be created.

Trigger name - Is the name of new trigger.

ON {table_name|view_name} keyword specifies the table or view name on which the trigger will be created.

AFTER clause specifies the insert, update or delete event which will fire the trigger.

Instead of clause is used to skip an insert, update or delete statement to a table and instead, executes other statements defined in the trigger.

[NOT FOR REPLICATION] It is used to specify to instruct SQL Server not to invoke the trigger when a replication agent modifies table.

SQL Statements:- SQL statements execute.

Use:- Trigger will be helpful when we need to execute some events automatically on certain desirable scenarios.



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Example :-

```
Create table Employee
( Id INT PRIMARY KEY,
  Name varchar(45), Salary INT,
  Gender varchar(12),
  DepartmentId INT
)
```

Insert Record:-

```
Insert INTO Employee values (1, "steff", 8200,,
  'Male', 3),
  (2, 'Amelie', 52000, 'Female', 2),
  (3, 'Antonio', 2500, 'male', 1),
  (4, 'Marco', 4700, 'Male', 2)
```

Select Record:-

```
Select * from Employee;
```