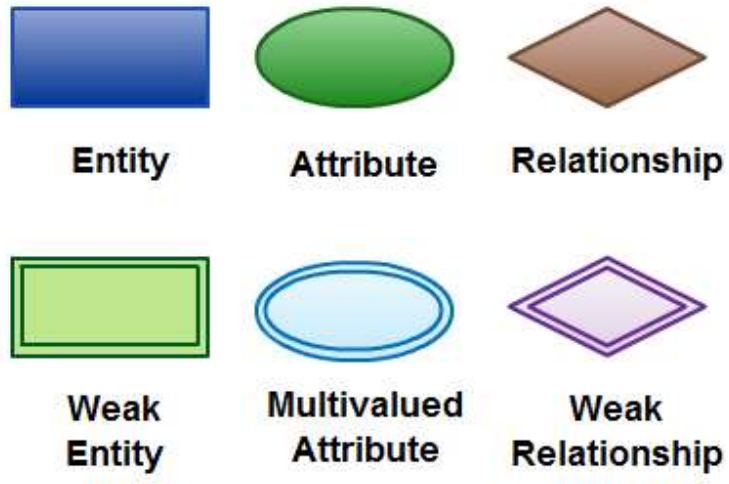
DATE:14/07/2022
DBMS DAY 1

Q1. Create ERD for college management system?
ANS :-
An Entity Relationship Diagram (ERD) is a visual representation of different entities within a system and how they relate to each other.
In the ERD following are the symbols used for their particular use.



There are three basic elements in an ER Diagram: entity, attribute, relationship..

Entity

An entity can be a person, place, event, or object that is relevant to a given system.and named using singular nouns.

Attribute

An attribute is a property, trait, or characteristic of an entity, relationship, or another attribute. attributes are represented by oval shapes.

Relationship

A relationship describes how entities interact. Relationships are represented by diamond shapes.

In the given ERD we have represented the college management system

The rectangle shows the all entities present they are :-

College

Department

Course

Subject

Professors

Students

Hod

The oval shape shows the attributes of the gives entities.

College :- college name, college id

Department :-dname, did.

Course :- cnmae, cid.

Subject :- sname, scode.

Professors :- profid, profname, profage, prof mob no., prof add.

Students :-studentid,studentname, studentage, studentdob, studentmob no., student address, student roll no.

Hod :- hid, hname.

Some attributes are tend to be unique for each record and that are called primary key.

In the given ERD these are some primary keys collegeid, did, cid, scode, profid, studentid,hid.

And the diamonds shape shows the relationship between different entities.

Here

one college is related to many department.

one department is related to many students.

one department is related to many course.

one department is related to one hod.

one department is related to many professors

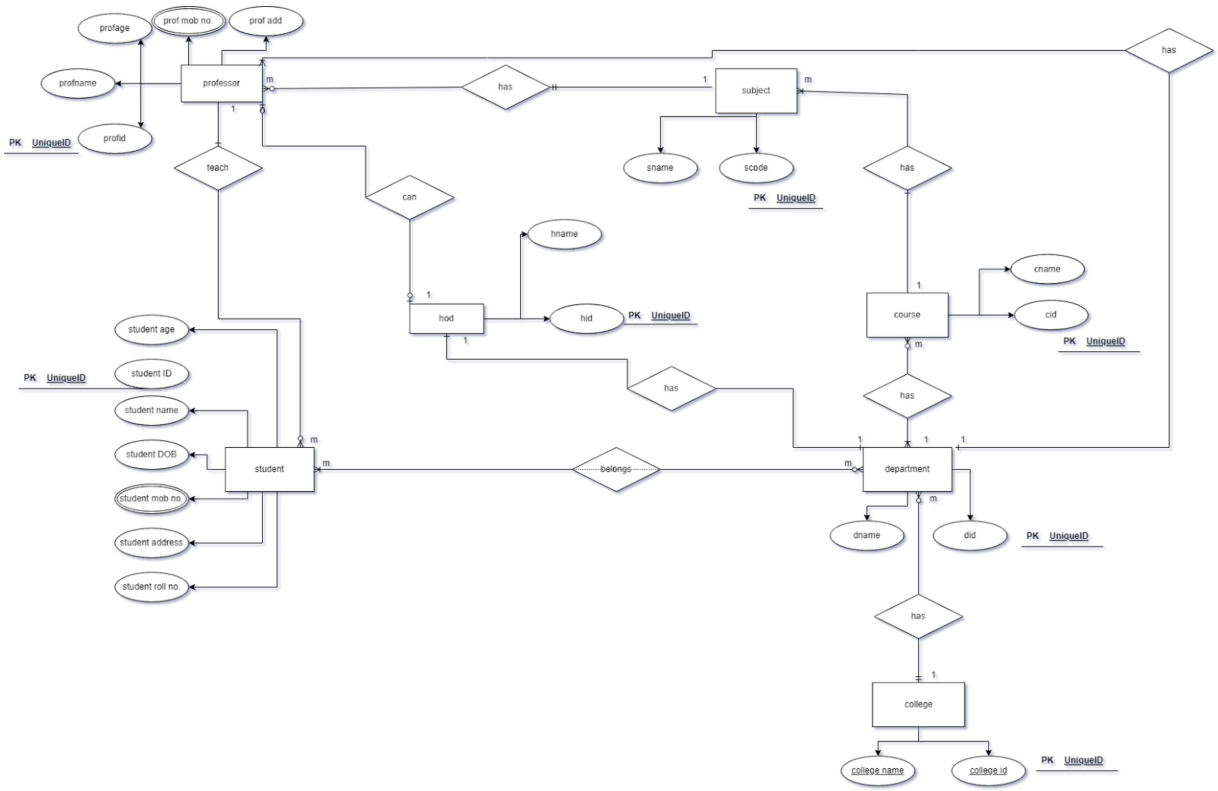
And like wise

One course is related to many subjects.

One subject is related to many professors.

Many students are relate to one professor.

Many professors are related to one department and like wise many more as showm in given ERD.



Q2. Explore database keys ?

Ans :-

1. **Super key** is a single key or a group of multiple keys that can uniquely identify tuples in a table. Super Key can contain multiple attributes that might not be able to independently identify tuples in a table, but when grouped with certain keys, they can identify tuples uniquely.

2.**Candidate key** is a single key or a group of multiple keys that uniquely identify rows in a table. A Candidate key is a subset of Super keys and is devoid of any unnecessary attributes that are not important for uniquely identifying tuples. The value for the Candidate key is unique and non-null for all tuples.

3. **Primary key** constraint uniquely identifies each record in a table. Primary keys must contain unique values, and cannot contain null values. A table can have only one primary key; and in the table, this primary key can consist of single or multiple columns (fields).

4. **Foreign key** is a field (or collection of fields) in one table, that refers to the primary key in another table. The table with the foreign key is called the child table, and the table with the primary key is called the referenced or parent table.

5. **Alternate key** are those candidate keys which are not the Primary key. There can be only one Primary key for a table. Therefore all the remaining Candidate keys are known as Alternate or Secondary keys.

6. **Composite key** in SQL can be defined as a combination of multiple columns, and these columns are used to identify all the rows that are involved uniquely. Even though a single column can't identify any row uniquely, a combination of over one column can uniquely identify any record.

7. **Unique key** is a constraint that is used to uniquely identify a tuple in a table. Multiple unique keys can present in a table. NULL values are allowed in case of a unique key.

Q3. Aim - design at least 10 sql queries for suitable database application using sql Dml statements-insert,select,update,delete with operators, functions and set operator

1. Create table Student with schema (roll_no, name, division, branch, city, marks)?

ANS :-

```
mysql> create table student(roll_no int,name varchar(40),division varchar(20),branch varchar(20),city varchar(20),marks float);
Query OK, 0 rows affected (0.04 sec)

mysql> show tables;
+-------------------------+
| Tables_in_dbmsassignment |
+-------------------------+
| student                 |
+-------------------------+
1 row in set (0.01 sec)
```

2.Insert 10 records to the table students ?

ANS:-

MySQL 8.0 Command Line Client

```
+----------+-------------+------+-----+---------+-------+
6 rows in set (0.07 sec)

mysql> insert into student values(1,"Aditya","A","computer","malkapur",89);
Query OK, 1 row affected (0.09 sec)

mysql> insert into student values(2,"mansi","A","computer","shegaon",90);
Query OK, 1 row affected (0.01 sec)

mysql> insert into student values(3,"Ayush","B","it","indore",87);
Query OK, 1 row affected (0.01 sec)

mysql> insert into student values(4,"Omkar","C","electronics","wardha",80);
Query OK, 1 row affected (0.01 sec)

mysql> insert into student values(5,"Hritik","d","civil","pune",85);
Query OK, 1 row affected (0.01 sec)

mysql> insert into student values(6,"Kunal","E","mechanical","chikali",93);
Query OK, 1 row affected (0.01 sec)

mysql> insert into student values(7,"Akshay","B","it","mumbai",89);
Query OK, 1 row affected (0.00 sec)

mysql> insert into student values(8,"sia","D","mechanical","nagpur",99);
Query OK, 1 row affected (0.00 sec)

mysql> insert into student values(9,"Abir","c","electronics","banglore",91);
Query OK, 1 row affected (0.01 sec)

mysql> insert into student values(10,"Advait","E","civil","goa",90);
Query OK, 1 row affected (0.00 sec)
```

3. List all the student names with their corresponding city ?

ANS :-

```
mysql> select name, city from student;
+--------+----------+
| name   | city     |
+--------+----------+
| Aditya | malkapur |
| mansi  | shegaon  |
| Ayush  | indore   |
| Omkar  | wardha   |
| Hritik | pune     |
| Kunal  | chikali  |
| Akshay | mumbai   |
| sia    | nagpur   |
| Abir   | banglore |
| Advait | goa      |
+--------+----------+
10 rows in set (0.00 sec)
```

4. List all the distinct names of the students?

ANS:-

```
mysql> select distinct name from student;
+--------+
| name   |
+--------+
| Aditya |
| mansi  |
| Ayush  |
| Omkar  |
| Hritik |
| Kunal  |
| Akshay |
| sia    |
| Abir   |
| Advait |
+--------+
10 rows in set (0.01 sec)
```

5. List all the records of the students with all the attributes?

:-

```
mysql> select * from student;
+---------+--------+----------+-------------+----------+-------+
| roll_no | name   | division | branch      | city     | marks |
+---------+--------+----------+-------------+----------+-------+
|       1 | Aditya | A        | computer    | malkapur |    89 |
|       2 | mansi  | A        | computer    | shegaon  |    90 |
|       3 | Ayush  | B        | it          | indore   |    87 |
|       4 | Omkar  | C        | electronics | wardha   |    80 |
|       5 | Hritik | d        | civil       | pune     |    85 |
|       6 | Kunal  | E        | mechanical  | chikali  |    93 |
|       7 | Akshay | B        | it          | mumbai   |    89 |
|       8 | sia    | D        | mechanical  | nagpur   |    99 |
|       9 | Abir   | c        | electronics | banglore |    91 |
|      10 | Advait | E        | civil       | goa      |    90 |
+---------+--------+----------+-------------+----------+-------+
10 rows in set (0.00 sec)
```

6. List all the students whose marks are greater than 75?

ANS:-

```
mysql> select * from student where marks>75;
+---------+--------+----------+-------------+----------+-------+
| roll_no | name   | division | branch      | city     | marks |
+---------+--------+----------+-------------+----------+-------+
|       1 | Aditya | A        | computer    | malkapur |    89 |
|       2 | mansi  | A        | computer    | shegaon  |    90 |
|       3 | Ayush  | B        | it          | indore   |    87 |
|       4 | Omkar  | C        | electronics | wardha   |    80 |
|       5 | Hritik | d        | civil       | pune     |    85 |
|       6 | Kunal  | E        | mechanical  | chikali  |    93 |
|       7 | Akshay | B        | it          | mumbai   |    89 |
|       8 | sia    | D        | mechanical  | nagpur   |    99 |
|       9 | Abir   | c        | electronics | banglore |    91 |
|      10 | Advait | E        | civil       | goa      |    90 |
+---------+--------+----------+-------------+----------+-------+
10 rows in set (0.01 sec)
```

7. List all the students whose name starts with the alphabet 'S ?

ANS:-

```
mysql> select * from student where name like "S%";
+---------+--------+----------+------------+----------+-------+
| roll_no | name   | division | branch     | city     | marks |
+---------+--------+----------+------------+----------+-------+
|       8 | sia    | D        | mechanical | nagpur   |    99 |
|      11 | Suraj  | E        | civil      | khamgaon |    55 |
|      12 | Sakshi | C        | computer   | pune     |    56 |
+---------+--------+----------+------------+----------+-------+
3 rows in set (0.00 sec)
```

8. List all the students whose marks are in the range of 50 to 60?

ANS:-

```
mysql> select * from student where marks between 50 and 60;
+---------+--------+----------+----------+----------+-------+
| roll_no | name   | division | branch   | city     | marks |
+---------+--------+----------+----------+----------+-------+
|      11 | Suraj  | E        | civil    | khamgaon |    55 |
|      12 | Sakshi | C        | computer | pune     |    56 |
|      13 | Prachi | BE       | computer | pune     |    59 |
+---------+--------+----------+----------+----------+-------+
3 rows in set (0.00 sec)
```

9. List all the students whose branch is 'computer and city is 'Pune'?

ANS:-

```
mysql> select * from student where branch="computer" and city="pune";
+---------+--------+----------+----------+------+-------+
| roll_no | name   | division | branch   | city | marks |
+---------+--------+----------+----------+------+-------+
|      12 | Sakshi | C        | computer | pune |    56 |
|      13 | Prachi | BE       | computer | pune |    59 |
+---------+--------+----------+----------+------+-------+
2 rows in set (0.00 sec)
```

10. Update the branch of a student to IT whose roll number is 9?

ANS:-

```
2 rows in set (0.00 sec)

mysql> update student set branch="it" where roll_no=9;
Query OK, 1 row affected (0.01 sec)
Rows matched: 1  Changed: 1  Warnings: 0
```

11. Delete the student records whose division is 'BE' ?

ANS :-

```
mysql> delete from student where division="BE";
Query OK, 1 row affected (0.00 sec)
```

12. Create another table TE_Students with Schema(roll_no, name) ?

ANS :-

```
mysql> create table TE_students(roll_no int,name varchar(40));
Query OK, 0 rows affected (0.03 sec)
```

13) List all the roll numbers unionly in the relations Student and TE_Students?

ANS:-

```
mysql> select roll_no from student union select roll_no from TE_students;
+---------+
| roll_no |
+---------+
|       1 |
|       2 |
|       3 |
|       4 |
|       5 |
|       6 |
|       7 |
|       8 |
|       9 |
|      10 |
|      11 |
|      12 |
|      14 |
|      15 |
|      16 |
|      19 |
|      23 |
+---------+
17 rows in set (0.00 sec)
```

14. Display name of all the students belonging to relation Student in Upper case?

ANS:-

```
mysql> select UPPER(name) from student;
+-------------+
| UPPER(name) |
+-------------+
| ADITYA      |
| MANSI       |
| AYUSH       |
| OMKAR       |
| HRITIK      |
| KUNAL       |
| AKSHAY      |
| SIA         |
| ABIR        |
| ADVAIT      |
| SURAJ       |
| SAKSHI      |
| ADITI       |
+-------------+
13 rows in set (0.01 sec)
```

15. Display the binary and hex equivalent of marks for all the students belonging to Student relation?

ANS:-

```
mysql> select binary marks from student;
+---------------------------+
| binary marks              |
+---------------------------+
| 0x3839                    |
| 0x3930                    |
| 0x3837                    |
| 0x3830                    |
| 0x3835                    |
| 0x3933                    |
| 0x3839                    |
| 0x3939                    |
| 0x3931                    |
| 0x3930                    |
| 0x3535                    |
| 0x3536                    |
| 0x3937                    |
+---------------------------+
13 rows in set, 1 warning (0.00 sec)
```

```
mysql> select hex(marks) from student;
+------------+
| hex(marks) |
+------------+
| 59         |
| 5A         |
| 57         |
| 50         |
| 55         |
| 5D         |
| 59         |
| 63         |
| 5B         |
| 5A         |
| 37         |
| 38         |
| 61         |
+------------+
13 rows in set (0.01 sec)

mysql>
```