Problem

Overview:

Efficient way to Manage the database of students enrolling in different courses and the associated lecturer with the details of the students,courses,lecturers and their lecture timing.

Statement:

In this project, we aim to design a database management system to store information on an students and the courses enrolled by them. This will Colleges in manage the students' information and the professors information in a simplified way.

The database stores information for each student and lecturer which helps them to manage their schedule and ease to manage the schedule. Every student may provide their profile information which includes Name, id,address of them. The database also includes the information about the courses opted by individual student. This may also include the time of lecture for the courses taken by the students for their academics.

The database is made useful for the lecturers. The contact details of faculties along with their profile can be maintained using this database. The database also records the time and date of the lecture maintained for the faculty reference.

The database also contains the information regarding the lecturer personal information, their id,contact details like email etc.

The database records the date of enrollment of the students in

a particular course.. Finally, this database aims to efficiently manages all the lecture and their schedule for smooth functioning.

Contents

- Tables
- Normalization of the tables
- Relational Schema
- ER Diagram
- SQL Operations (creation of tables)
- Queries

TABLES

ENROLLMENT TABLE

```
Name                        Null?      Type
------------------          --------   ------------
STUDENT_NUM                 NOT NULL   NUMBER(38)
DATE_OF_ENROLLMENT                     DATE
COURSE_NAME                            VARCHAR2(20)
CC                                     VARCHAR2(20)
```

STUDENT TABLE

```
Name              Null?      Type
-----------       --------   ------------
FNAME                        VARCHAR2(20)
LANME                        VARCHAR2(20)
NID               NOT NULL   NUMBER(38)
ADDRESS                      VARCHAR2(20)
BDATE                        DATE
STUDENT_NUM                  NUMBER(38)
```

LECTURER TABLE

```
-----------       --------   ------------
L_ID              NOT NULL   NUMBER(38)
L_LASTNAME                   VARCHAR2(20)
L_FIRSTANME                  VARCHAR2(20)
L_EMAIL                      VARCHAR2(20)
L_ADDRESS                    VARCHAR2(20)
```

SUBJECTS TABLE

```
------------ -------- ------------
SUBJECT_CODE NOT NULL NUMBER(38)
L_ID                  NUMBER(38)
SUBJECT_UNIT          VARCHAR2(20)
SUBJECT_UDSC          VARCHAR2(20)
```

LECTURE TABLE

```
------------ -------- ------------
CC                    NUMBER(38)
SUBJECT               VARCHAR2(20)
TIME                  VARCHAR2(20)
DATE_L                DATE
LECTURER_NAME         VARCHAR2(20)
STUDENT_NUM  NOT NULL NUMBER(38)
L_ID         NOT NULL NUMBER(38)
```

1. ENROLLMENT

   PRIMARY KEY –> STUDENT_NUM

   NORMALISATION

   THERE IS **NO PARTIAL DEPENDENCY** THEREFORE THE TABLE IS IN **2NF.**
   THERE IS **NO TRANSITIVE DEPENDENCY** THEREFORE THE TABLE IS IN **3NF.**
   ALL DEPENDENCIES ARE FROM **CANDIDATE KEY** THEREFORE THE TABLE
IS **BCNF**

2. STUDENT

    PRIMARY KEY –> NID

FOREIGN KEY –> STUDENT_NUM

THERE IS **NO PARTIAL DEPENDENCY** THEREFORE THE TABLE IS IN **2NF.**
    THERE IS **NO TRANSITIVE DEPENDENCY** THEREFORE THE TABLE IS IN **3NF.**
    ALL DEPENDENCIES ARE FROM **CANDIDATE KEY** THEREFORE THE TABLE
IS **BCNF**

3. <u>LECTURER</u>

PRIMARY KEY –> L_ID

NORMALISATION

THERE IS **NO PARTIAL DEPENDENCY** THEREFORE THE TABLE IS IN **2NF.**
THERE IS **NO TRANSITIVE DEPENDENCY** THEREFORE THE TABLE IS IN **3NF.**
ALL DEPENDENCIES ARE FROM **CANDIDATE KEY** THEREFORE THE TABLE
IS **BCNF**

4. <u>SUBJECTS</u>

PRIMARY KEY –> SUBJECT_CODE

FOREIGN KEY –> L_ID

THERE IS **NO PARTIAL DEPENDENCY** THEREFORE THE TABLE IS IN **2NF.**
THERE IS **NO TRANSITIVE DEPENDENCY** THEREFORE THE TABLE IS IN **3NF.**
ALL DEPENDENCIES ARE FROM **CANDIDATE KEY** THEREFORE THE TABLE
IS **BCNF**

5. <u>EXAM</u>

PRIMARY KEY –> L_ID,STUDENT_NUM

FOREIGN KEY –> L_ID,STUDENT_NUM

THERE IS **NO PARTIAL DEPENDENCY** THEREFORE THE TABLE IS IN **2NF.**
THERE IS **NO TRANSITIVE DEPENDENCY** THEREFORE THE TABLE IS IN **3NF.**
ALL DEPENDENCIES ARE FROM **CANDIDATE KEY** THEREFORE THE TABLE
IS **BCNF**
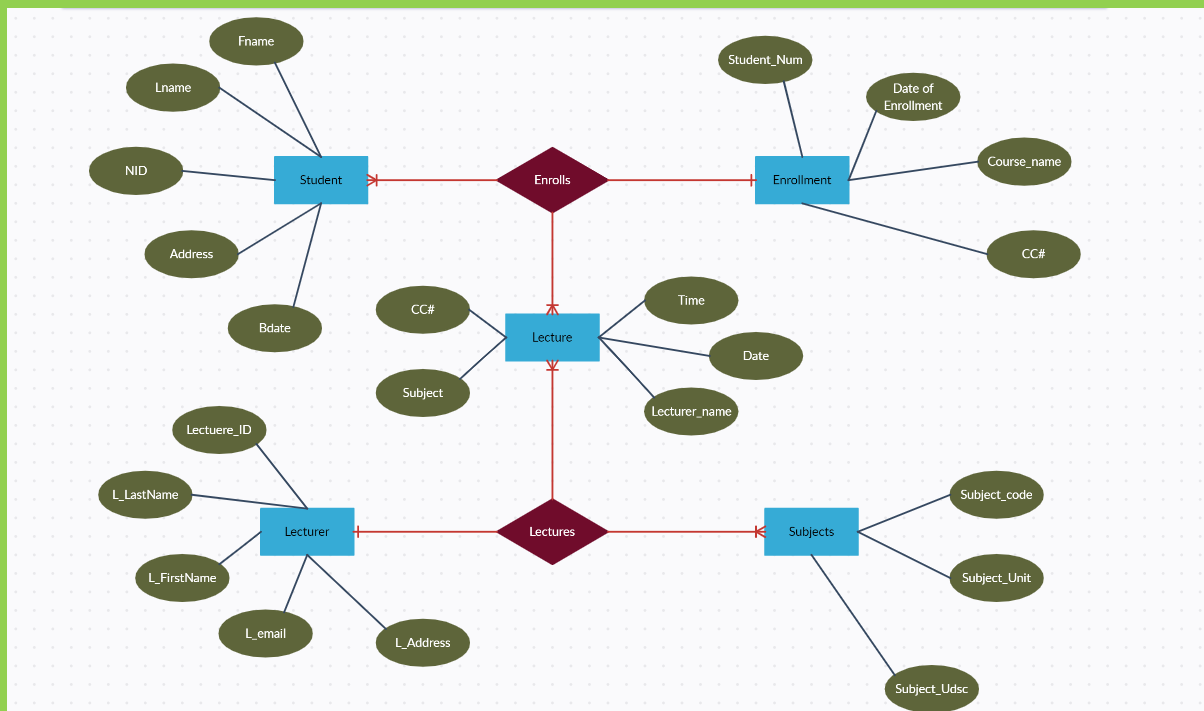
E-R DIAGRAM FOR ENROLLMENT SYSTEM

TABLE CREATIONS

CREATE TABLE ENROLLMENT(

  STUDENT_NUM INT,

  DATE_OF_ENROLLMENT DATE,

  COURSE_NAME VARCHAR(20),

  CC INT,

  PRIMARY KEY(STUDENT_NUM)

  );

  DESCRIBE enrollment;

CREATE TABLE STUDENT(

  FNAME VARCHAR(20),

  LANME VARCHAR(20),

  NID INT,

  ADDRESS VARCHAR(20),

  BDATE DATE,

  STUDENT_NUM INT,

  PRIMARY KEY(NID),

```sql
    FOREIGN KEY(STUDENT_NUM) REFERENCES ENROLLMENT(STUDENT_NUM)
    );
CREATE TABLE LECTURER(
    L_ID INT,
    L_LASTNAME VARCHAR(20),
    L_FIRSTANME VARCHAR(20),
    L_EMAIL VARCHAR(20),
    L_ADDRESS VARCHAR(20),
    PRIMARY KEY(L_ID)
    );

CREATE TABLE SUBJECTS(
    SUBJECT_CODE INT,
    L_ID INT,
    SUBJECT_UNIT VARCHAR(20),
    SUBJECT_UDSC VARCHAR(20),
    PRIMARY KEY(SUBJECT_CODE),
    FOREIGN KEY(L_ID) REFERENCES LECTURER(L_ID)
    );
CREATE TABLE LECTURE(
    CC INT,
    SUBJECT VARCHAR(20),
    TIME VARCHAR(20),
    DATE_L DATE,
    LECTURER_NAME VARCHAR(20),
    STUDENT_NUM INT,
    L_ID INT,
    PRIMARY KEY(STUDENT_NUM,L_ID),
    FOREIGN KEY(L_ID) REFERENCES LECTURER(L_ID),
    FOREIGN KEY(STUDENT_NUM) REFERENCES ENROLLMENT(STUDENT_NUM)
    );
```

VALUE INSERTIONS

INSERT INTO ENROLLMENT VALUES(1,'04-APR-2021','CSE',1);

INSERT INTO ENROLLMENT VALUES(2,'04-APR-2021','ECE',2);

INSERT INTO ENROLLMENT VALUES(3,'08-APR-2021','CSE',1);

INSERT INTO ENROLLMENT VALUES(4,'10-APR-2021','ECE',2);

INSERT INTO ENROLLMENT VALUES(5,'12-APR-2021','EEE',3);

INSERT INTO ENROLLMENT VALUES(6,'15-APR-2021','IT',4);

INSERT INTO ENROLLMENT VALUES(7,'18-APR-2021','CSE',1);

INSERT INTO ENROLLMENT VALUES(8,'19-APR-2021','IT',4);

INSERT INTO ENROLLMENT VALUES(9,'20-APR-2021','EEE',3);

INSERT INTO ENROLLMENT VALUES(10,'21-APR-2021','EEE',3);

INSERT INTO STUDENT VALUES('RAM','KUMAR',1,'DELHI','04-APR-2000',1);

INSERT INTO STUDENT VALUES('SHYAM','KUMAR',2,'PATNA','03-APR-2001',2);

INSERT INTO STUDENT VALUES('NAMAN','SINGH',3,'WARANGAL','02-MAR-2000',3);

INSERT INTO STUDENT VALUES('RAMAN','SINGH',4,'WARANGAL','02-MAR-2000',4);

INSERT INTO STUDENT VALUES('AMITESH','ANAND',5,'HYDERABAD','04-AUG-2000',5);

INSERT INTO STUDENT VALUES('RAJ','KAUSHIK',6,'RANCHI','05-MAY-2000',6);

INSERT INTO STUDENT VALUES('ABHISHEEL','DAS',7,'DELHI','04-APR-2000',7);

INSERT INTO STUDENT VALUES('SHUBRANSHU','SHEKHAR',8,'PATNA','04-JUN-2000',8);

INSERT INTO STUDENT VALUES('PANAKJ','KUMAR',9,'MUMBAI','09-APR-2000',9);

INSERT INTO STUDENT VALUES('HARSH','KUMAR',10,'DELHI','30-APR-2000',10);

INSERT INTO LECTURER VALUES(1,'LECTURER1','LASTNAME1','L1@GMAIL','HYDERABAD');

INSERT INTO LECTURER VALUES(2,'LECTURER2','LASTNAME2','L2@GMAIL','HYDERABAD');

INSERT INTO LECTURER VALUES(3,'LECTURER3','LASTNAME3','L3@GMAIL','WARANGAL');

INSERT INTO LECTURER VALUES(4,'LECTURER4','LASTNAME4','L4@GMAIL','HYDERABAD');

INSERT INTO LECTURER VALUES(5,'LECTURER5','LASTNAME5','L5@GMAIL','WARANGAL');

```
INSERT INTO SUBJECTS VALUES(1,1,'UNIT1','TOPIC3');
INSERT INTO SUBJECTS VALUES(2,1,'UNIT5','TOPIC4');
INSERT INTO SUBJECTS VALUES(3,2,'UNIT3','TOPIC5');
INSERT INTO SUBJECTS VALUES(4,2,'UNIT7','TOPIC1');
INSERT INTO SUBJECTS VALUES(5,3,'UNIT6','TOPIC3');
INSERT INTO SUBJECTS VALUES(6,3,'UNIT4','TOPIC4');
INSERT INTO SUBJECTS VALUES(7,4,'UNIT4','TOPIC6');
INSERT INTO SUBJECTS VALUES(8,4,'UNIT5','TOPIC7');
INSERT INTO SUBJECTS VALUES(9,5,'UNIT3','TOPIC4');
INSERT INTO SUBJECTS VALUES(10,5,'UNIT3','TOPIC3');

INSERT INTO LECTURE VALUES(1,'MOT','10AM','04-APR-2021','LECTURER1',1,1);
INSERT INTO LECTURE VALUES(1,'DAA','10AM','05-APR-2021','LECTURER1',2,1);
INSERT INTO LECTURE VALUES(1,'DBMS','8AM','06-APR-2021','LECTURER2',3,2);
INSERT INTO LECTURE VALUES(1,'OOP','9AM','07-APR-2021','LECTURER2',4,2);
INSERT INTO LECTURE VALUES(2,'DSA','11AM','08-APR-2021','LECTURER3',5,3);
INSERT INTO LECTURE VALUES(2,'PLL','2PM','09-APR-2021','LECTURER3',6,3);
INSERT INTO LECTURE VALUES(3,'DKK','3PM','10-APR-2021','LECTURER4',7,4);
INSERT INTO LECTURE VALUES(3,'NA','4PM','11-APR-2021','LECTURER4',8,4);
INSERT INTO LECTURE VALUES(4,'DSA','11AM','12-APR-2021','LECTURER5',9,5);
INSERT INTO LECTURE VALUES(4,'OOP','10AM','13-APR-2021','LECTURER5',10,5);
```

TABLES

	STUDENT_NUM	DATE_OF_ENROLLMENT	COURSE_NAME	CC
1	1	04-04-21	CSE	1
2	2	04-04-21	ECE	2
3	3	08-04-21	CSE	1
4	4	10-04-21	ECE	2
5	5	12-04-21	EEE	3
6	6	15-04-21	IT	4
7	7	18-04-21	CSE	1
8	8	19-04-21	IT	4
9	9	20-04-21	EEE	3
10	10	21-04-21	EEE	3

	FNAME	LANME	NID	ADDRESS	BDATE	STUDENT_NUM
1	RAM	KUMAR	1	DELHI	04-04-00	1
2	SHYAM	KUMAR	2	PATNA	03-04-01	2
3	NAMAN	SINGH	3	WARANGAL	02-03-00	3
4	RAMAN	SINGH	4	WARANGAL	02-03-00	4
5	AMITESH	ANAND	5	HYDERABAD	04-08-00	5
6	RAJ	KAUSHIK	6	RANCHI	05-05-00	6
7	ABHISHEEL	DAS	7	DELHI	04-04-00	7
8	SHUBRANSHU	SHEKHAR	8	PATNA	04-06-00	8
9	PANAKJ	KUMAR	9	MUMBAI	09-04-00	9
10	HARSH	KUMAR	10	DELHI	30-04-00	10

	L_ID	L_LASTNAME	L_FIRSTANME	L_EMAIL	L_ADDRESS
1	1	LECTURER1	LASTNAME1	L1@GMAIL	HYDERABAD
2	2	LECTURER2	LASTNAME2	L2@GMAIL	HYDERABAD
3	3	LECTURER3	LASTNAME3	L3@GMAIL	WARANGAL
4	4	LECTURER4	LASTNAME4	L4@GMAIL	HYDERABAD
5	5	LECTURER5	LASTNAME5	L5@GMAIL	WARANGAL

	SUBJECT_CODE	L_ID	SUBJECT_UNIT	SUBJECT_UDSC
1	1	1	UNIT1	TOPIC3
2	2	1	UNIT5	TOPIC4
3	3	2	UNIT3	TOPIC5
4	4	2	UNIT7	TOPIC1
5	5	3	UNIT6	TOPIC3
6	6	3	UNIT4	TOPIC4
7	7	4	UNIT4	TOPIC6
8	8	4	UNIT5	TOPIC7
9	9	5	UNIT3	TOPIC4
10	10	5	UNIT3	TOPIC3

	CC	SUBJECT	TIME	DATE_L	LECTURER_NAME	STUDENT_NUM	L_ID
1	1	MOT	10AM	04-04-21	LECTURER1	1	1
2	1	DAA	10AM	05-04-21	LECTURER1	2	1
3	1	DBMS	8AM	06-04-21	LECTURER2	3	2
4	1	OOP	9AM	07-04-21	LECTURER2	4	2
5	2	DSA	11AM	08-04-21	LECTURER3	5	3
6	2	PLL	2PM	09-04-21	LECTURER3	6	3
7	3	DKK	3PM	10-04-21	LECTURER4	7	4
8	3	NA	4PM	11-04-21	LECTURER4	8	4
9	4	DSA	11AM	12-04-21	LECTURER5	9	5
10	4	OOP	10AM	13-04-21	LECTURER5	10	5

QUERIES

DISPLAY COUSES OFFERED;
SELECT DISTINCT(COURSE_NAME) FROM ENROLLMENT;

	COURSE_NAME
1	EEE
2	IT
3	CSE
4	ECE

DISPLAY NAMES OF ALL THE STUDENTS AND THIER IDS
SELECT FNAME,NID FROM STUDENT;

	FNAME	NID
1	RAM	1
2	SHYAM	2
3	NAMAN	3
4	RAMAN	4
5	AMITESH	5
6	RAJ	6
7	ABHISHEEL	7
8	SHUBRANSHU	8
9	PANAKJ	9
10	HARSH	10

DISPLAY NAMES OF ALL THE LECTURERS AND THIER IDS
SELECT L_LASTNAME,L_ID FROM LECTURER;

L_LASTNAME	L_ID
1 LECTURER1	1
2 LECTURER2	2
3 LECTURER3	3
4 LECTURER4	4
5 LECTURER5	5

DISPLAY SUBJECT_CODE,SUBJECT_UNIT OF ALL THE SUBJECTS
SELECT SUBJECT_CODE,SUBJECT_UNIT FROM SUBJECTS;

	SUBJECT_CODE	SUBJECT_UNIT
1	1	UNIT1
2	2	UNIT5
3	3	UNIT3
4	4	UNIT7
5	5	UNIT6
6	6	UNIT4
7	7	UNIT4
8	8	UNIT5
9	9	UNIT3
10	10	UNIT3

DISPLAY NO OF LECTURE TAKING PLACE ON DIFFERENT DATE
SELECT DATE_L,COUNT(*) FROM LECTURE GROUP BY DATE_L;

	DATE_L	COUNT(*)
1	05-04-21	1
2	07-04-21	1
3	13-04-21	1
4	04-04-21	1
5	08-04-21	1
6	06-04-21	1
7	10-04-21	1
8	11-04-21	1
9	12-04-21	1
10	09-04-21	1

DISPLAY NO OF LECTURES TAKEN BY EACH LECTURER
SELECT LECTURER_NAME,COUNT(*) FROM LECTURE GROUP BY LECTURER_NAME;

	LECTURER_NAME	COUNT(*)
1	LECTURER1	2
2	LECTURER3	2
3	LECTURER2	2
4	LECTURER5	2
5	LECTURER4	2

END

	LECTURER_NAME	COUNT(*)
1	LECTURER1	2
2	LECTURER3	2
3	LECTURER2	2
4	LECTURER5	2