```
CDIP-UIU: Python & Data Analysis
Batch - 09

Welcome to the 2nd lecture on MySQL!


------------------
| Some more DDL! |
------------------

Foreign key --> for referring another table


CREATE TABLE IF NOT EXISTS tablename(
    col1 datatype [NOT NULL] [DEFAULT def_val] [AUTO_INCREMENT],
    col2 datatype [NOT NULL] [DEFAULT def_val] [AUTO_INCREMENT],
    ...
    ...
    coln datatype [NOT NULL] [DEFAULT def_val] [AUTO_INCREMENT],


    CONSTRAINT constraint_name  PRIMARY KEY(col1, col2),
    CONSTRAINT constraint_name1 UNIQUE(col3, col10),

    CONSTRAINT constraint_name2 FOREIGN KEY(col11, col15)
                                REFERENCES ref_tbl_name(ref_tbl_colname1,
ref_tbl_colname2)
                                ON DELETE RESTRICT/CASCADE/SET NULL,

    CONSTRAINT constraint_name2 FOREIGN KEY(col13, col20)
                                REFERENCES ref_tbl_name1(ref_tbl_colname1,
ref_tbl_colname2)
                                ON DELETE RESTRICT/CASCADE/SET NULL
)


ON DELETE = RESTRICT --> won't let you delete
            CASCADE --> deletes all child table data (the ones referring)
            SET NULL --> will replace the value with null


Students table:     (child table)
===============

-------------------------------------------------
| ID (pk) | name | dob      | cgpa | dept (fk) |
-------------------------------------------------
| 1       | A    | 01.01.95 | 3.50 | 1         | --> a student's info
-------------------------------------------------
| 2       | B    | 04.02.95 | 3.33 | 2         |
-------------------------------------------------
| 3       | C    | 18.02.95 | 3.63 | 3         |
-------------------------------------------------
| 4       | A    | 01.04.95 | 3.46 | 3         |
-------------------------------------------------

Departments table:  (parent table)
==================

```

```
-----------------------------------------------
| ID (pk) | name   | head  | no_of_faculties |
-----------------------------------------------
| 1       | CSE    | Dr. A | 20              |
-----------------------------------------------
| 2       | EEE    | Dr. B | 18              |
-----------------------------------------------
| 3       | BBA    | Dr. C | 22              |
-----------------------------------------------
| 4       | Civil  | Dr. D | 23              |
-----------------------------------------------



CREATE TABLE IF NOT EXISTS students (
    id INT PRIMARY KEY AUTO_INCREMENT,
    name VARCHAR(30),
    dob DATE,
    admission_date DATE,
    cgpa FLOAT(3,2),
    dept INT,

    CONSTRAINT fk_students_departments FOREIGN KEY(dept) REFERENCES departments(id) ON DELETE RESTRICT
);



How to update database configuration:
--------------------------------------

1) how to add new column:
--------------------------
ALTER TABLE tablename
ADD COLUMN colname datatype [PRIMARY KEY] [UNIQUE] [NOT NULL] [DEFAULT def_val] [AUTO_INCREMENT]


2) how to delete existing column:
----------------------------------
ALTER TABLE tablename
DROP COLUMN colname


3) how to delete existing primary key:
---------------------------------------
ALTER TABLE tablename
DROP PRIMARY KEY


4) how to add new primary key:
-------------------------------
ALTER TABLE tablename
ADD CONSTRAINT constraint_name  PRIMARY KEY(col1, col2)


5) how to add unique constraint:
---------------------------------
ALTER TABLE tablename
ADD CONSTRAINT constraint_name1 UNIQUE(col3, col10)
```

```
6) how to delete existing unique constraint:
---------------------------------------------
ALTER TABLE tablename
DROP INDEX unique_constraint_name


7) how to add new FOREIGN KEY constraint:
-----------------------------------------
ALTER TABLE tablename
ADD CONSTRAINT constraint_name2 FOREIGN KEY(col11, col15)
                                REFERENCES ref_tbl_name(ref_tbl_colname1,
ref_tbl_colname2)
                                ON DELETE RESTRICT/CASCADE/SET NULL


8) how to delete FOREIGN KEY constraint:
----------------------------------------
ALTER TABLE tablename
DROP FOREIGN KEY fk_constraint_name


9) how to add DEFAULT value constraint:
---------------------------------------
ALTER TABLE tablename
ALTER COLUMN colname SET DEFAULT default_value


10) how to delete default condition:
------------------------------------
ALTER TABLE tablename
ALTER COLUMN colname DROP DEFAULT


----------- End of DDL -----------------


================================================


------------------------
| Continuation of DML! |
------------------------


Updating data:
--------------
UPDATE table_name
SET column1 = value1, column2 = value2, ...
WHERE condition;


Calculations inside select:
---------------------------
SELECT col1 + col2,
       col1 - col2,
       col1 * col2,
       col1 / col2,
       col1 % col2,
```

```
FROM tablename


Aliasing:
---------
SELECT name AS `Student's Name`,
     cgpa*100 AS 'CGPA Multiplied by 100'
FROM students


SELECT name AS `Student's Name`,
     id AS 'ID',
       cgpa AS 'CGPA',
     (cgpa*100)+id AS 'CGPA Multiplied by 100 plus ID'
FROM students


Distinct data:
--------------
Using 'DISTINCT' keyword

SELECT DISTICK MANAGER_ID
FROM employees


Sorting:
--------
Using 'ORDER BY' keyword

- without sorting:
SELECT CONCAT(FIRST_NAME, ' ', LAST_NAME) as 'Full Name',
     SALARY as 'Salary'
FROM employees

- with sorting

Example 1:
SELECT CONCAT(FIRST_NAME, ' ', LAST_NAME) as 'Full Name',
     SALARY as 'Salary'
FROM employees
ORDER BY SALARY [DESC|ASC]

Example 2:
SELECT CONCAT(FIRST_NAME, ' ', LAST_NAME) as 'Full Name',
     SALARY as 'Salary'
FROM employees
ORDER BY FIRST_NAME ASC

Example 3: --> (Sorting with multiple parameters)
SELECT CONCAT(FIRST_NAME, ' ', LAST_NAME) as 'Full Name',
     SALARY as 'Salary'
FROM employees
ORDER BY SALARY ASC, FIRST_NAME DESC


Limiting:
---------

First 5 employees:
------------------
```

```
SELECT EMPLOYEE_ID AS 'ID',
     CONCAT(FIRST_NAME, ' ', LAST_NAME) as 'Full Name',
     SALARY as 'Salary'
FROM employees
LIMIT 5



Last 5 employees:
-----------------
SELECT EMPLOYEE_ID AS 'ID',
     CONCAT(FIRST_NAME, ' ', LAST_NAME) as 'Full Name',
     SALARY as 'Salary'
FROM employees
ORDER BY EMPLOYEE_ID DESC
LIMIT 5


Offset:
-------
SELECT EMPLOYEE_ID AS 'ID',
     CONCAT(FIRST_NAME, ' ', LAST_NAME) as 'Full Name',
     SALARY as 'Salary'
FROM employees
ORDER BY EMPLOYEE_ID DESC
LIMIT 10, 5

--> LIMIT offset, no_of_rows



'LIKE' / String Matching
------------------------

Exact match
WHERE first_name='abc'

WHERE col = 'value'



String pattern match using 'LIKE' operator

% = 0 to inf character / (star operation) --> RegEx = Regular Expression
_ = exatly 1 character / (plus operation) --> RegEx = Regular Expression


Examples of %:
--------------

1) %a%

example: fjdkjfdkjakfdjfkdjfk
         aaaa
         bab
         a
         ba
         ab


```

2) %

example: any combination of characters including ''

3) %a

example: fkdfjdkjfkdja
         fdjfdkja
         ba
         a

Examples of _:
----

1) _a_

example: bab
         cab
         aaa

2) _a

example: ba
         aa
         ca

col LIKE 'pattern'

Example:
SELECT EMPLOYEE_ID, FIRST_NAME
FROM employees
WHERE FIRST_NAME LIKE '%l%'

ex: show those employees whose first name starts with 'a'
WHERE FIRST_NAME LIKE 'a%'

ex: name ends with 'a'
WHERE FIRST_NAME LIKE '%a'

ex: name contains 'abc'
WHERE FIRST_NAME LIKE '%abc%'

ex: name consists of 3 characters
WHERE FIRST_NAME LIKE '___'

ex: name contains at least 3 characters
WHERE FIRST_NAME LIKE '___%'