06/05/24

SQL 02 : KEYS

AGENDA — Superkeys

1. Candidate keys
2. Primary keys
3. Composite keys
4. Foreign keys
5. Intro to SQL (CRUD)

SUPER KEY

A col(s) that can be used to identify a row uniquely.

Table: Students

name	email	batch	phone_no	psp

	SK	CK (minimal)
name	✗	✗
email	✓	✓
psp	✗	✗
name, batch	✗	✗
name, email	✓	✗
email, psp	✓	✗
phone_no	✓	✓
phone_no, batch	✓	✗
phone_no, batch, psp		

CANDIDATE KEY

Minimal set of col(s) that can be used to identify a row uniquely.

PRIMARY KEY

It is a candidate key chosen to uniquely identify a row in a table.

Note: ① DB sorts the data based on PK.
② DB creates an index on PK (indexes are stored on disk)

(4 bytes)	(20 bytes)
int	string.

GOOD PK (since, used as index)

① Easy / fast to sort.
② Should be small in size.
③ Rarely changes.

(PK) C1	C2
123	101
124	302
125	
126	205
127	301
128.	407

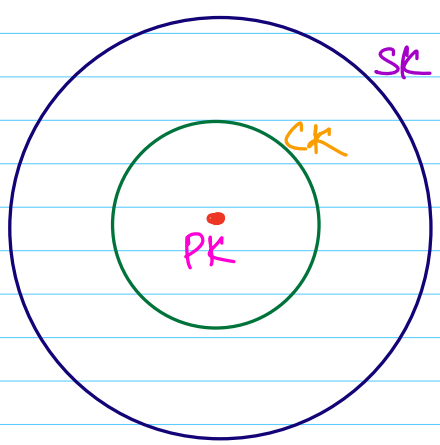
(4) COMPOSITE KEY (combination)

key with multiple columns is a composite key.

student-classes

Stud_id	class_id
1	101
1	102
2	101
2	102
?	
.	
.	

(Candidate key) PK :- (stud_id, class_id)



Emp_id, Dept
Email

Assume: (FName, LName) → UNIQUE

NOT a Candidate key.

A. Employee_id ✓
B. Email ✓
C. (FName, LName) ✓
D. (LName, Dept) ✗

Kumar, Engg
Kumar, Engg

FOREIGN KEY

(PL)/SQL → Structured Query Language.

Note: CASE INSENSITIVE

Assignments: Case Sensitive (upper/lower case)
A
a

CREATE TABLE

CREATE TABLE <table-name> (

col-name data-type CONSTRAINTS

);

eg #

```
CREATE TABLE STUDENTS (
    Stud_id INT PRIMARY KEY
    Stud_name VARCHAR(50) . .
    : —
);
```

CONSTRAINT (Restrictions, Validation, Limitation)

1. PRIMARY KEY (UNIQUE + NOT NULL)
2. NOT NULL
3. UNIQUE
4. AUTO-INCR
5. CHECK — e.g # salary INT CHECK salary > 0
6. DEFAULT
7. FOREIGN KEY
8. CREATE INDEX

BREAK TILL → 8:23 Am.

table: students (FK)

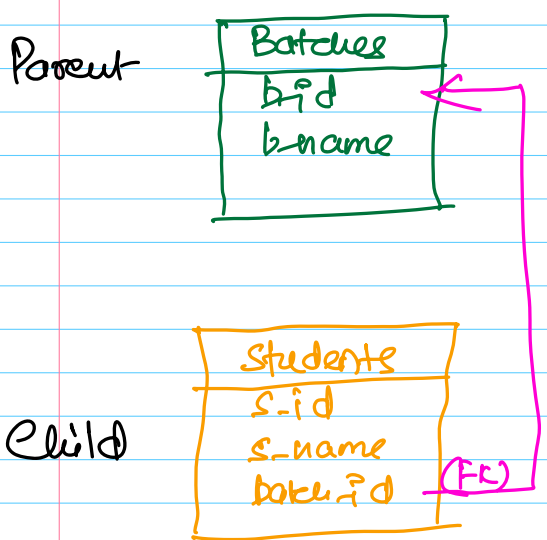
Sid	S_name	batch_id
1	Aman	1
2	Chaitanyam	2
3	Raman	2
4	Ajay	3
5	Shubham	1
6.	Mahendra	4

table: batches

b_id	b_name
1	X
2	Y
3	Z

FOREIGN KEY

UNIQUE (Need NOT be PK)



Parent will notify all the children if the referred value gets deleted / updated.

Child can do –

1. CASCADE
2. SET NULL
3. RESTRICT / NO ACTION
4. SET DEFAULT (default)

(Not supported MySQL)

QUERIES

```
CREATE DATABASE SQL_030524;
use SQL_030524;

CREATE TABLE BATCHES (
B_ID INT UNIQUE,
b_name VaRcHaR(50)
);

INSERT INTO BATCHES(B_ID, B_NAME)
VALUES (1, 'MORNING'),
(2, 'EVENING');

CREATE TABLE STUDENTS (
STUD_ID INT PRIMARY KEY AUTO_INCREMENT,
STUD_NAME VARCHAR(50) NOT NULL,
BATCH_ID INT,
FOREIGN KEY (BATCH_ID) REFERENCES BATCHES(B_ID)
ON DELETE CASCADE ON UPDATE CASCADE
);

INSERT INTO STUDENTS (STUD_NAME, BATCH_ID)
VALUES ('KAUSHIK', 1),
```

```
('SHUBHAM', 2),
('ALIZAIN', 2);


-- Error Code: 1452. Cannot add or update a child row:
-- a foreign key constraint fails
-- (`sql_030524`.`students`, CONSTRAINT `students_ibfk_1`
-- FOREIGN KEY (`BATCH_ID`) REFERENCES `batches` (`B_ID`))


UPDATE BATCHES
SET B_ID = 99
WHERE B_ID = 2;

-- Error Code: 1451. Cannot delete or update a parent row:
-- a foreign key constraint fails (`sql_030524`.`students`,
-- CONSTRAINT `students_ibfk_1` FOREIGN KEY (`BATCH_ID`)
-- REFERENCES `batches` (`B_ID`))

DELETE FROM BATCHES WHERE B_ID = 1;

-- Error Code: 1451. Cannot delete or update a parent row: a foreign key constraint fails
(`sql_030524`.`students`, CONSTRAINT `students_ibfk_1` FOREIGN KEY (`BATCH_ID`) REFERENCES
`batches` (`B_ID`))

DROP TABLE STUDENTS;
```