

# Keys

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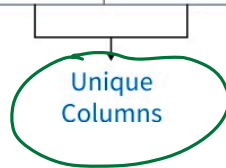
Super keys : any combination  
candidate : minimal combination



## 2. Candidate Key

### Students

name	email	phone. no	psp	b_id
Rahul	<u>Rahul@...</u>	829376769	89	1
Naman	Naman@.	956453789	91	2
Rahul	<u>Rahul@...</u>	806122348	98	1



**Question :** How many of them are super key?

### Column Name

### Super Key

name



email



phone number



psp, batch



name, batch, psp



name, phone number



email, phone number, name



email, phone number



**Definition :** Minimum ( non - redundant ) columns which are required to uniquely identify a row is called Candidate Key.

- A candidate Key is a super key where no column can be removed and still have property of uniquely identifying a row.
- If anymore column can be removed from a candidate key, it will no longer be able to uniquely identify a row.

$(a, b, c, d) \rightarrow CK$

Now let's remove columns that weren't necessary from above example.

Column Name	Candidate Key	Super Key
name	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
email	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
phone number	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
psp, batch	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
name, batch, psp	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
name, phone number	<input checked="" type="checkbox"/> }	<input checked="" type="checkbox"/> -
email, phone number, name	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<del>email, phone number</del>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

*we can have multiple candidate keys*



## students\_attendance

s_id	class_id	attendance
1	2	80
2	2	75
1	3	80

*s\_id*  
Mohit  
Mohit  
Akash

SQL 1  
SQL 2  
SQL 1

Att  
↓

**Question-1 :** Is s\_id unique here? **X**

**Question-2 :** Is class\_id unique here? **X**

**Why?**

Same students can attend multiple classes like Joins-1, Joins-2 etc.

### Column Name

s\_id

class\_id

attendance

s\_id, class\_id

*Primary Key*

### SK

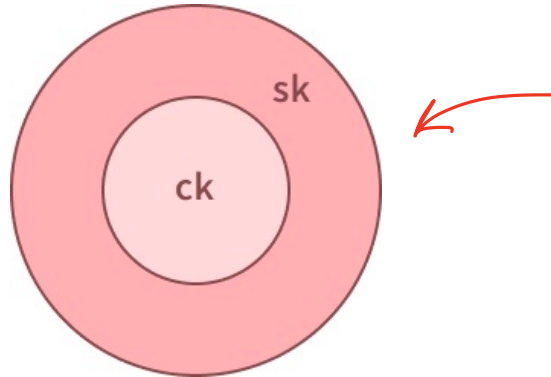


### CK





Quiz-1 : Is a ck always a super key? Yes .



Quiz-2 : Is a super key always a candidate key? No ,

CK for employee table

Quiz-3 : ~~Is a super key always a candidate key?~~

i.

empId, dept

SK



CK



ii.

Email



iii.

FN, LN



iv.

LN, Dept





### 3. Primary Key

Among all <sup>candidate</sup> ~~primary keys~~ we will choose a primary key. There is only 1 PK in a table.



#### Students

name	email	phone. no	psp	b_id
Rahul	Rahul@...	829376769	89	1
Naman	Naman@.	956453789	91	2
Rahul	Rahul@...	806122348	98	1

[ email  
phone no ]

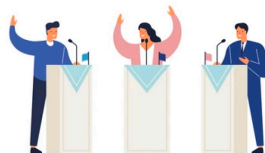
SK

Party Workers



CK

Candidates



PK

Prime Minister



#### Internally

1. Database sorts the data by primary key
2. Database outputs the results of every query sorted by a primary key.
3. Database creates an index as well on primary key.

↑ space, time consuming

emp-id int  
email string  
↓  
higher chances of getting updated

#### A good primary should :

1. Be fast to sort on.
2. Have smaller size ( to reduce the space required for behind the scenes indexing.)
3. Not get changed.



below  
In above table which column should become **PK** ?

a  
id

X  
name

email  
↑ ✓

phone number  
↑

X  
psp

X  
b\_id

0130-64563298  
+91 ↗

**Question-1 :** What if student updates the email?

**Question-2 :** What if student went abroad and updated phone number?

**Have you noticed Scaler provides this feature?**

Therefore we sometimes add one more column having unique integer value.

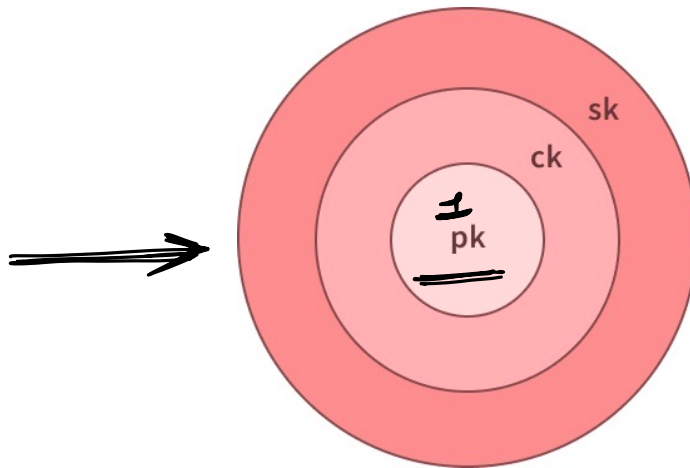
Ex : s\_id and roll\_no

**Students**

s_id	name	email	phone. no	psp	b_id
1	Rahul	Rahul@...	829376769	89	1
2	Naman	Naman@.	956453789	91	2
3	Rahul	Rahul@...	806122348	98	1

Primary Key

Quiz :



composite — composition





#### 4. Composite Keys

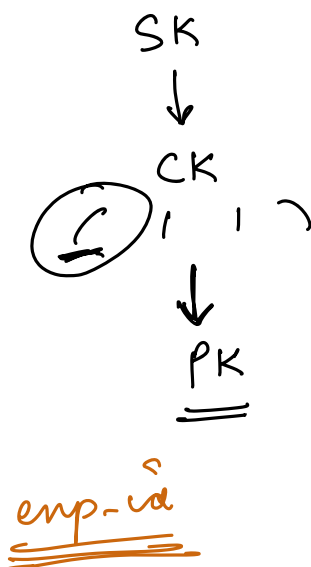
composite PK →

- A key using (more than one column) to uniquely identify a row.
- A sk, ck and a pk can be a composite key as well.

table → 1 PK  
↓  
(only one column)  
(set of columns)

null, null

primary key → unique & not null.

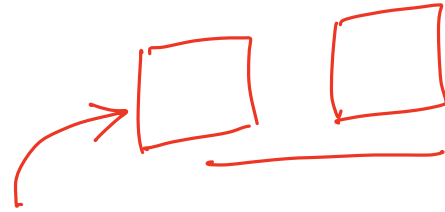


composite  
↓  
more than  
one column

sn-id, class-id



# Introduction to SQL



- SQL stands for Structured Query Language
- It is a language used to interact with relational databases.
- It allows you to create tables, fetch data from them, update data, manage user permissions.
- It helps us to do the following :

Create

Read

Update

Delete

Database



Coal Mine

MySQL



Mine  
Management

SQL



Workers

**Note :** SQL is case sensitive.

Let's write some code now ! 🤖



## Create

- Used to create new DB.
- Used to create new table

Students

name	psp	attendance	b_id
Himanshu	80	85	2
Rahul	92	85	2
Krish	95	95	1
Rohit	80	88	1

Rahul	92	85	2
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 →

### < / > Syntax

Create database database\_name;

Create table table\_name ( column\_name datatype constraint )

*typed notes*

→ **Note :** We have added content on datatype in your typed notes. Please go through them before next session.

Break : 10:12 pm



## 5. Foreign Keys



Students

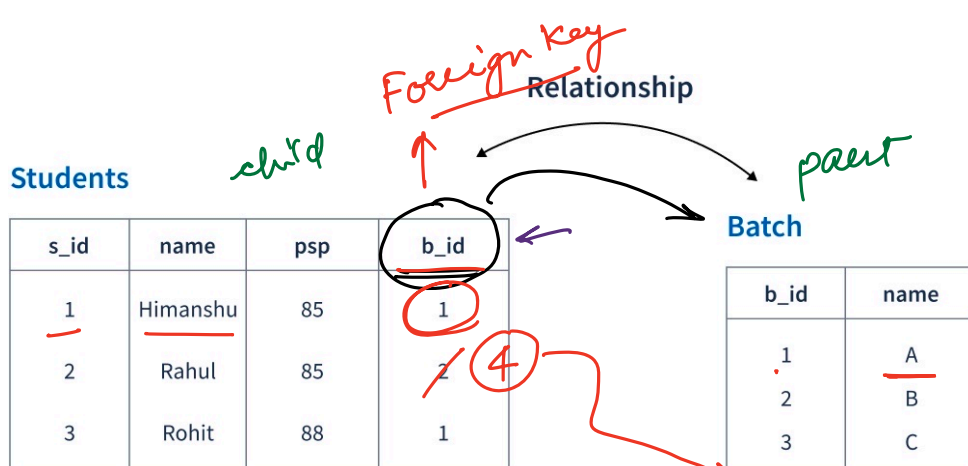
s_id	name	psp
1	Himanshu	85
2	Rahul	85
3	Rohit	88

Batch

b_id	name
1	A
2	B
3	C

↑ No

**Question :** Is there any link in these tables ?

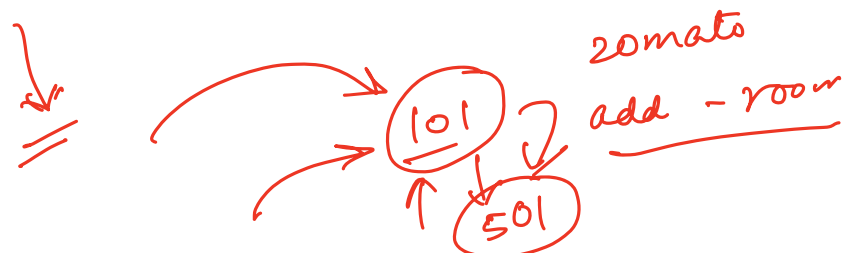


a unique col<sup>n</sup> in Table A can become a foreign key in Table B.



**Definition :** A foreign key is a column in a table that references a column in another table.

- It has nothing to do with primary, super and candidate keys.
- It can be any column in one table that refers to any column in another table.
- In our case, batch\_id is a foreign key in students table that references the id column in the batches table
- This ensures that the batch id we're storing in the students table is a valid id.
- If we try to insert any value in the batch id column of students table that isn't present in id column of batches table, it will fail.
- In general we keep them as PK.
- If not a PK it should be column with unique constraints.
- If not a PK it should be column with unique constraints else there will be a ambiguity.





- In case of Deletion or Updation data we might need to take care of them.

How?

cascade

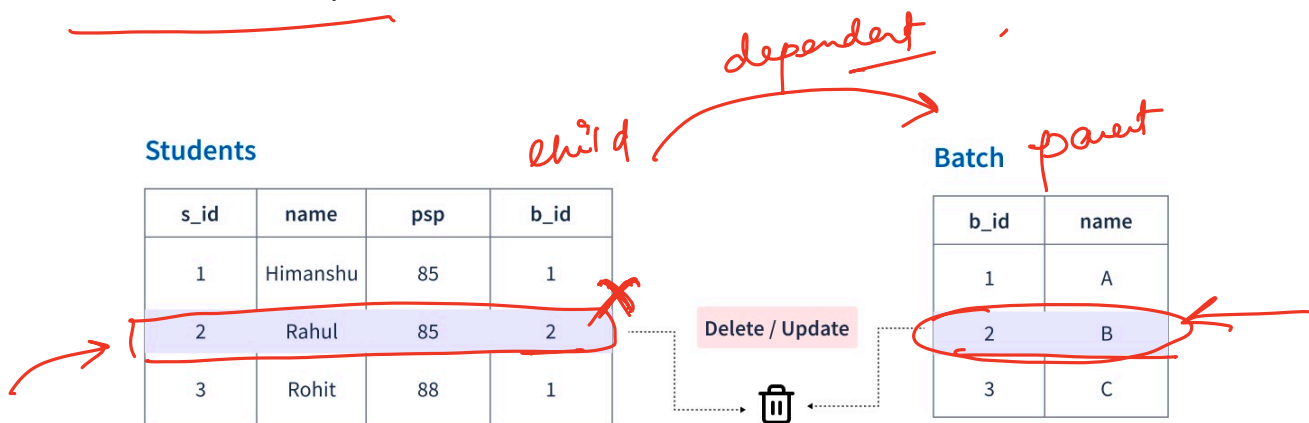
No action

set null

set default

## 1. Cascade

If the referenced data is deleted or updated all rows containing that foreign key are also deleted or updated.



## 2. Set Null

If the referenced data is deleted or updated, the foreign key in all rows containing in that foreign key is set to null. This assumes that the foreign key column is not set to NOT NULL.



Students

s_id	name	psp	b_id
1	Himanshu	85	1
2	Rahul	85	NULL
3	Rohit	88	1

Batch

b_id	name
1	A
2	B
3	C

 Delete / Update

### 3. No Action *'s default*

If the referenced data is deleted or updated, MySQL will not execute the update or delete operation on present table. This is the default action.

Students

s_id	name	psp	b_id
1	Himanshu	85	1
2	Rahul	85	2
3	Rohit	88	1

Batch

b_id	name
1	A
2	B
3	C

 Delete / Update

✗

### 4. Set Default

If the referenced data is deleted or updated, the foreign key in all the referencing rows is set to its default values. This is only functional with tables that use the InnoDB engine and where the foreign key column(s) have not been defined to have a NOT NULL attribute



Students

s_id	name	psp	b_id
1	Himanshu	85	1
2	Rahul	85	2
3	Rohit	88	1

(-1)  
default



Delete / Update

Batch

b_id	name
1	A
2	B
3	C





## Announcement

- What **NEXT?**

1. Assignment / Homework
2. Read Notes
3. Download MySQL workbench if not done so far.

**MCQ's again !**



