SQL Database

Looking back

1. Part of speech
2. NLTK library
3. Key phrases
4. Rake library
5. Attribute phrase model

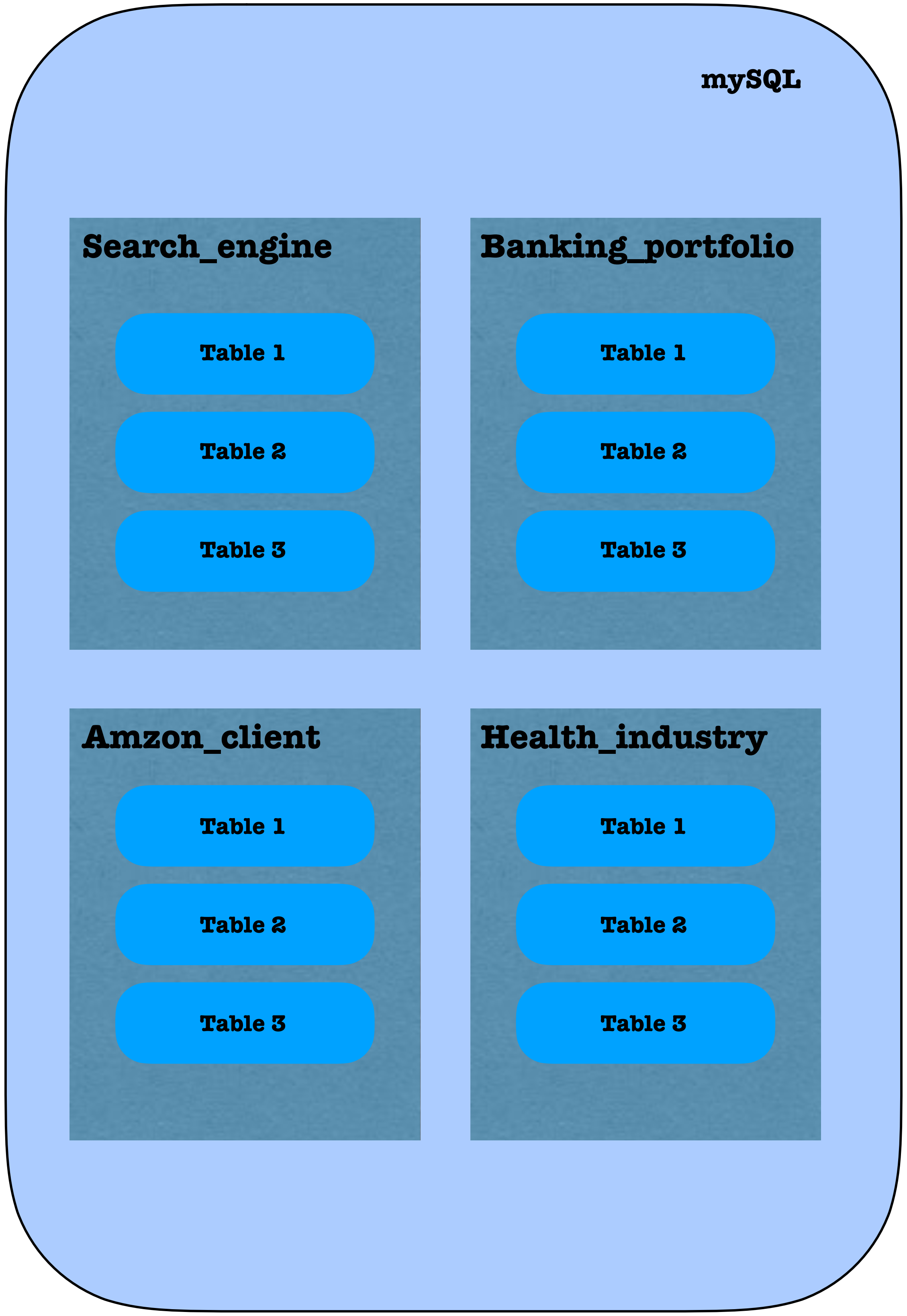
There are 3 types of databases are present:

1. Relational databases
2. Graph databases
3. Non relational databases

We will be looking at Relational Database

A relational database is a database that organises information into one or more tables consisting rows which represent an item and columns represents the properties of an item.

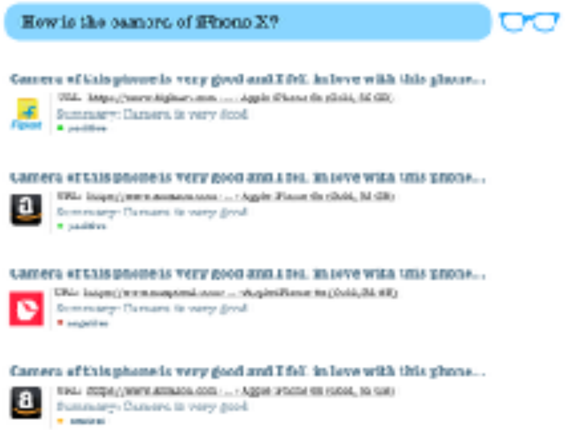
How does mySQL database looks:



Today's topics

1. Case study
2. Creating a database and operations on database
3. Creating tables and operations on tables
4. Create documents in tables and operations on documents
5. Constraints on columns

1 Case study



How is the camera of iPhone X?

Camera of this phone is very good and I fell in love with this phone…

URL: https://www.flipkart.com › ... › Apple iPhone [illegible]

Summary: Camera is very good

positive

Camera of this phone is very good and I fell in love with this phone…

URL: https://www.amazon.com › ... › Apple iPhone [illegible]

Summary: Camera is very good

positive

Camera of this phone is very good and I fell in love with this phone…

URL: https://www.snapdeal.com › ... › Apple iPhone [illegible]

Summary: Camera is very good

negative

Camera of this phone is very good and I fell in love with this phone…

URL: https://www.amazon.com › ... › Apple iPhone [illegible]

Summary: Camera is very good

neutral

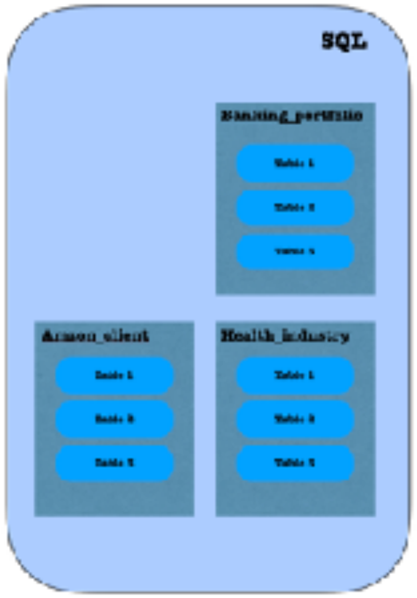
Let’s say you want to build a review search engine. In order to build such search engine you need to collect reviews from different websites and store it. You might need to store the data for various reasons. For example-

- In order to collect reviews from different websites.
- In order to provide reviews when a user searches for some query.
- In order to store the results of models which will help you to provide search service.

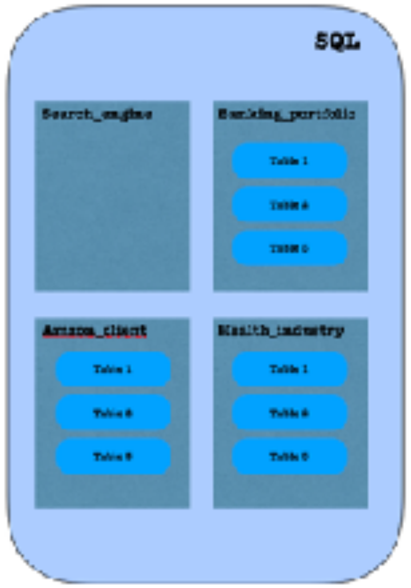
How would you design a mysql storage architecture for your search engine.

DATABASE

2 Creating a database and operations on database



```
CREATE DATABASE Search_engine;
```



Operations with respect to database

Database commands

- Create a database
- Use a database
- Delete a database
- List all databases

Create a database	`mysql> CREATE DATABASE db_name;`
Use a database	`mysql> USE DB_NAME;`
List all databases	`mysql> SHOW DATABASES;`
Delete a database	`mysql> DROP DATABASE db_name;`

TABLE

2 Creating tables and operations on tables

List all the things that we need to build the review search engine

1. **We need to collect product data from different websites like amazon, Flipkart etc**
2. **We need to collect review data for individual pages from different websites.**
3. **We might need to run different models and store the results of those models.**
   - **A** **We might need to run some models with respect to page data**
   - **B** **We might need to run some models with respect to review data**

Apple iPhone X (Silver, 256 GB)

₹73,490

Color

Storage

page_data

Category model

Model output on page data

Review data

Category model
Sentiment model
Attribute model

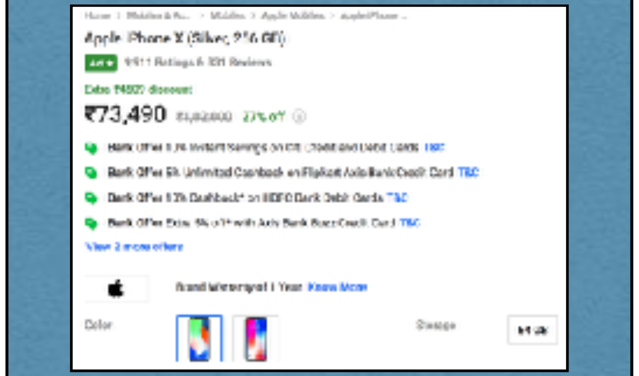
Model output on review data

Let's gather some information about these tables

How we can describe each of these tables?

What is the type of each descriptor?

Page



Home > Mobiles & Ac... > Mobiles > Apple Mobiles > Apple iPhone ...

Apple iPhone X (Silver, 256 GB)

4.6 ★ 9,911 Ratings & 901 Reviews

Extra ₹4800 discount

₹73,490 ₹1,02,000 27% off

Bank Offer [illegible] Instant Savings on [illegible] Credit and Debit Cards T&C

Bank Offer 5% Unlimited Cashback on Flipkart Axis Bank Credit Card T&C

Bank Offer 10% Cashback* on HDFC Bank Debit Cards T&C

Bank Offer Extra 5% off* with Axis Bank Buzz Credit Card T&C

View 2 more offers

Brand Warranty of 1 Year Know More

Color

Storage

64 GB

title	String
description	String
Price	Int
avg_stars	Float
no_of_reviews	Int
Page_id	String

Page_models

Category model

Page_id	String
category	String

Review

5 ★ Must buy!

[illegible]

5 ★ Classy product

[illegible]

4 ★ Good choice

[illegible]

Review_id	String
Review	String
reviewer_name	String
review_star	Int
review_time	Date
Page_id	String

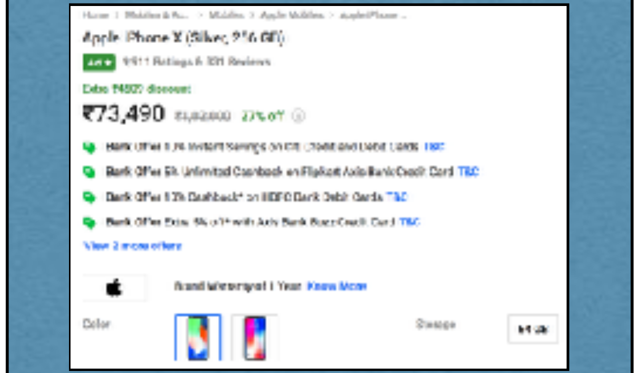
Review_models

Category model
Sentiment model
Attribute model

Review_id	String
category	String
Sentiment	Int
Attributes	String

Let's create a table

Page



Home > Mobiles & A... > Mobiles > Apple Mobiles > Apple iPhone ...

Apple iPhone X (Silver, 256 GB)

4.6 ★ 9,911 Ratings & 891 Reviews

Extra ₹4827 discount

₹73,490 ~~₹1,02,000~~ 27% off

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- Bank Offer 10% Cashback* on HDFC Bank Debit Cards T&C
- Bank Offer Extra 5% off* with Axis Bank Buzz Credit Card T&C

View 2 more offers

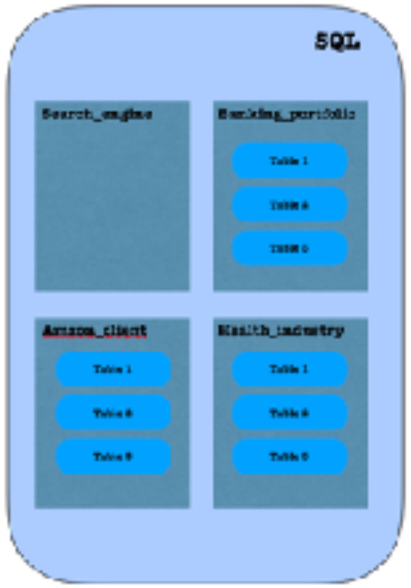
Brand Warranty of 1 Year Know More

Color

Storage

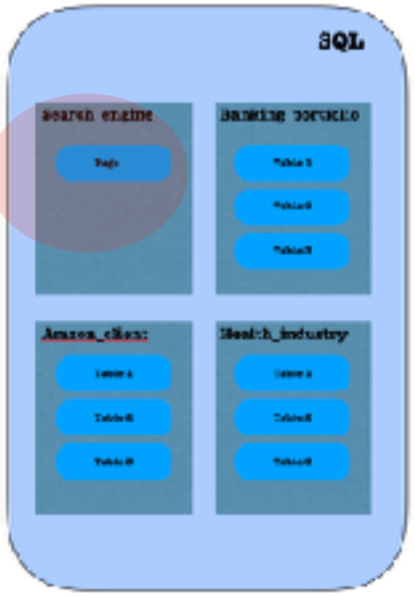
64 GB

title	**String**
description	**String**
Price	**Int**
avg_stars	**Float**
no_of_reviews	**Int**
Page_id	**String**



Name of the table

```
CREATE TABLE Page(
    Title VARCHAR(255),
    Description
    VARCHAR(250),
    Price INT,
    Avg_stars Float,
    No_of_reviews Int,
    Page_id VARCHAR(250)
    );
```



Operations with respect to table

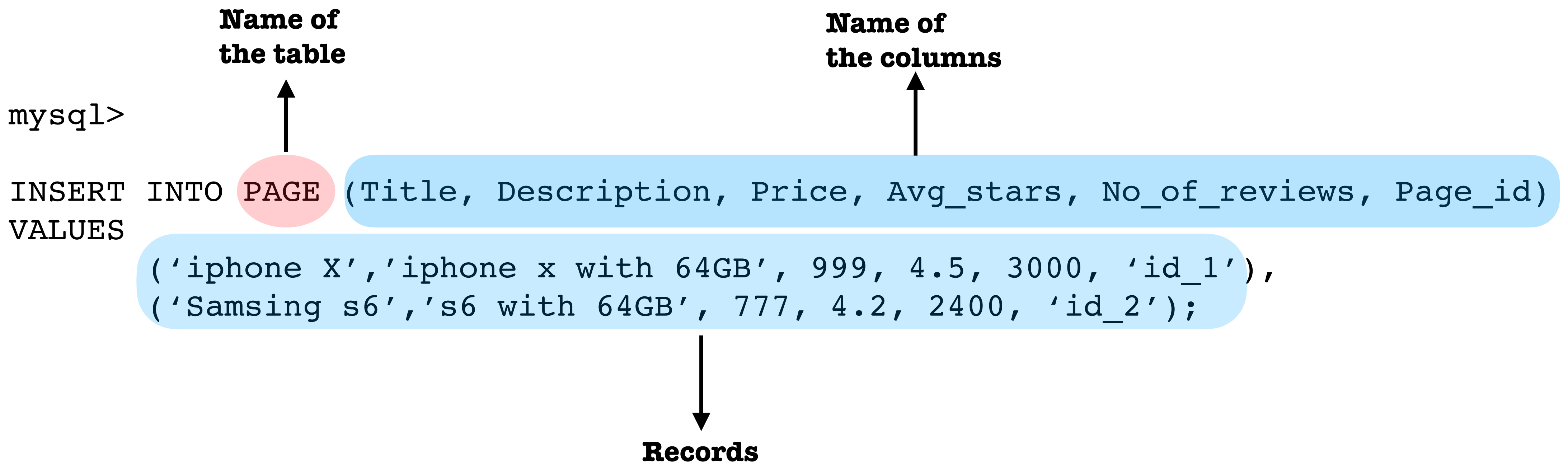
Table commands

Create a table	

Alter a table	`mysql> ALTER TABLE Review_model`
	`ADD language VARCHAR(250);`

Delete a table	`mysql> DROP TABLE Review_model;`
List all tables	`mysql> SHOW TABLES;`
List all columns	`mysql> DESCRIBE TABLE_NAME;`

3 Let’s create some documents in tables



```
mysql>
INSERT INTO PAGE (Title, Description, Price, Avg_stars, No_of_reviews, Page_id)
VALUES
        (‘iphone X’,’iphone x with 64GB’, 999, 4.5, 3000, ‘id_1’),
        (‘Samsing s6’,’s6 with 64GB’, 777, 4.2, 2400, ‘id_2’);
```

Operations with respect to documents

Database commands

- Insert a document
- Show documents
- Delete a document
- Update document

Insert a document

Show documents

```
mysql> SELECT * FROM PAGE;
```

Delete a document

```
mysql> DELETE FROM PAGE;
mysql> DELETE FROM PAGE WHERE PRICE<50;
```

Update a document

```
mysql> UPDATE PAGE SET PRICE=1000
       WHERE PRICE>900
```

SQL Commands to manipulate data

SQL manipulations

1 Data Definition Language(DDL):

- CREATE
- ALTER
- DROP

2 Data Manipulation Langauge(DML)

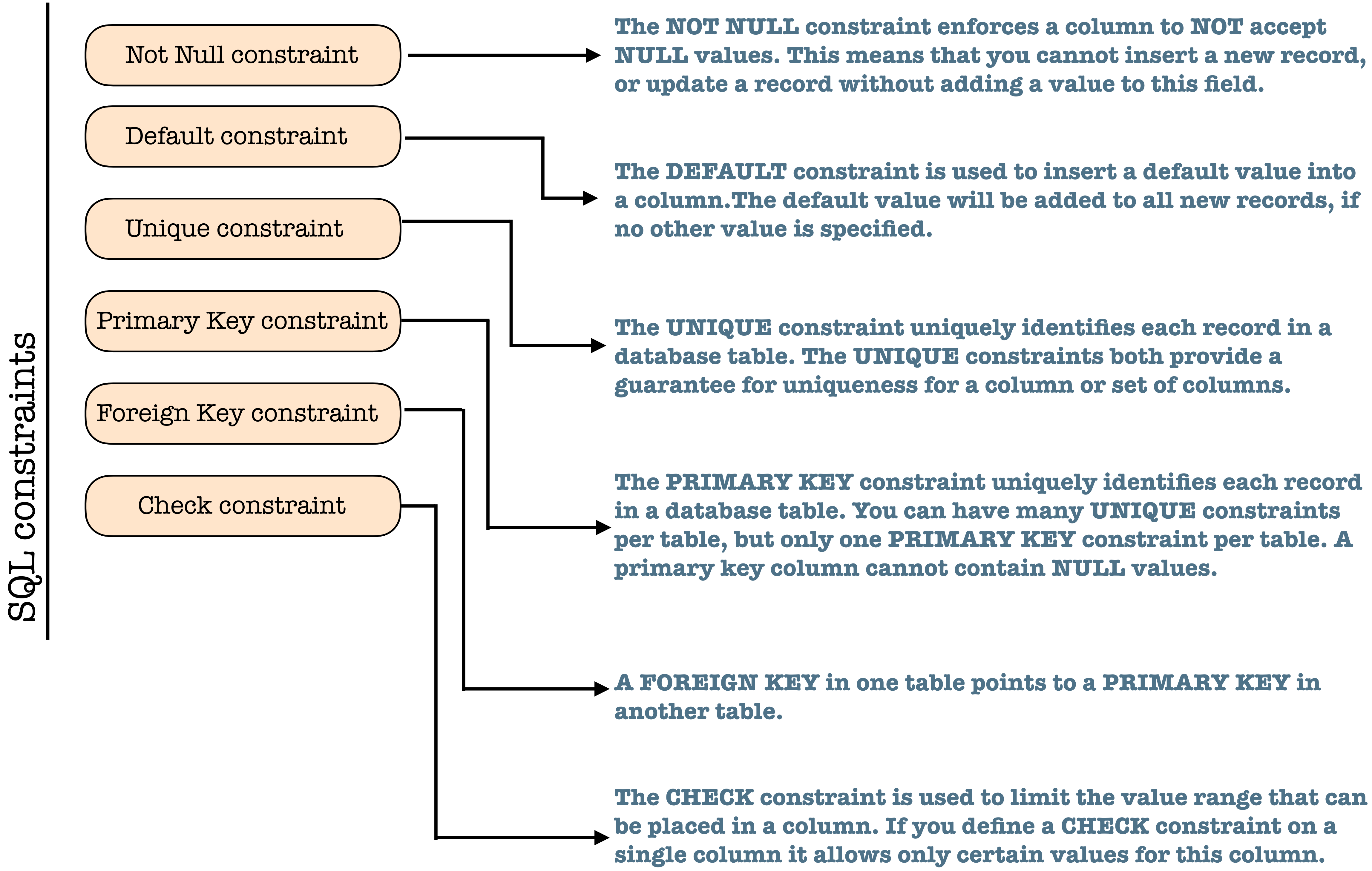
- INSERT
- UPDATE
- DELETE

3 Data Query Langauge(DQL)

- SELECT
- SHOW
- DESCRIBE

5 Constraints on columns

We can specify certain constraints while creating SQL database



SQL constraints

Not Null constraint

The NOT NULL constraint enforces a column to NOT accept NULL values. This means that you cannot insert a new record, or update a record without adding a value to this field.

Default constraint

The DEFAULT constraint is used to insert a default value into a column.The default value will be added to all new records, if no other value is specified.

Unique constraint

The UNIQUE constraint uniquely identifies each record in a database table. The UNIQUE constraints both provide a guarantee for uniqueness for a column or set of columns.

Primary Key constraint

The PRIMARY KEY constraint uniquely identifies each record in a database table. You can have many UNIQUE constraints per table, but only one PRIMARY KEY constraint per table. A primary key column cannot contain NULL values.

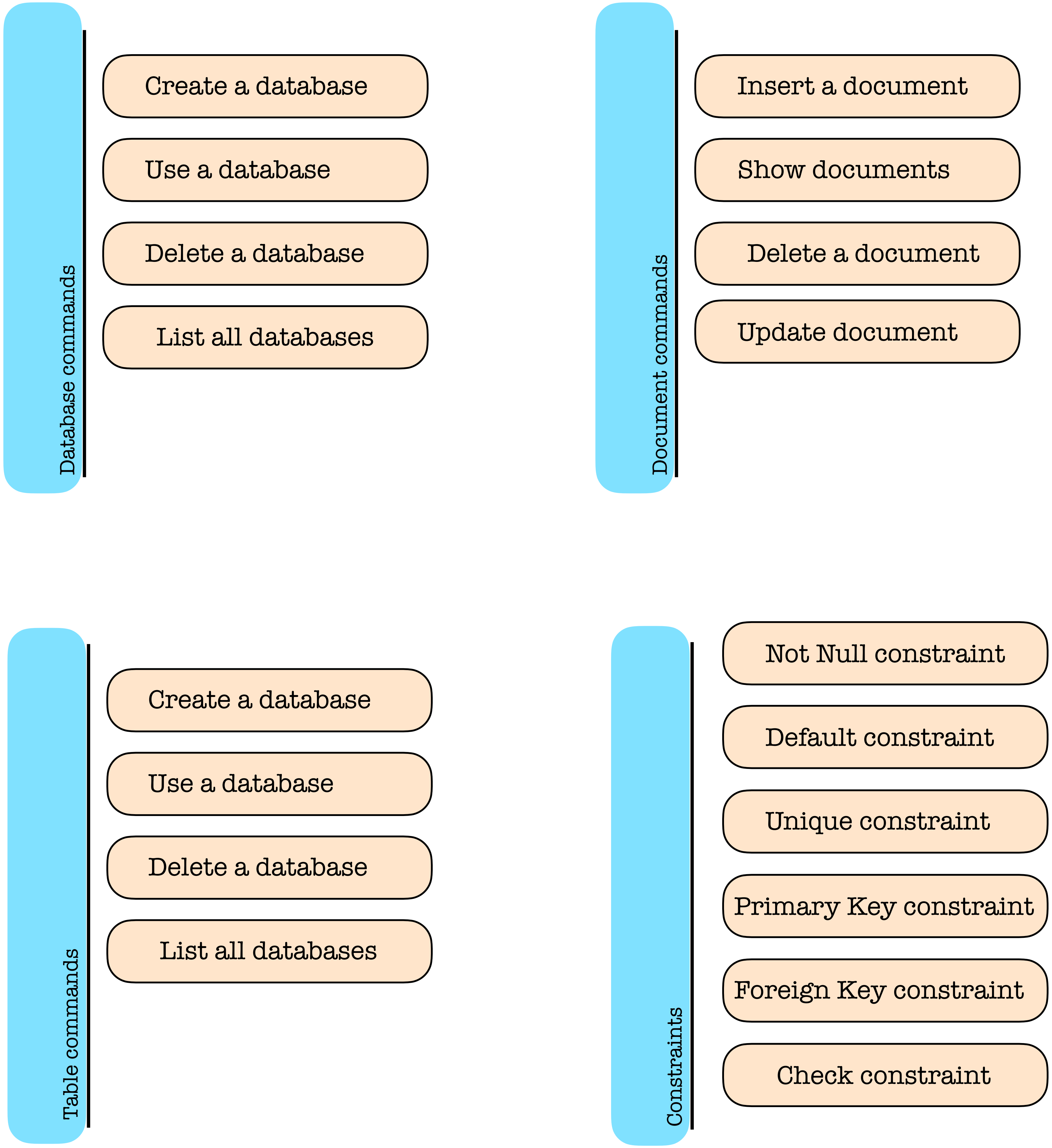
Foreign Key constraint

A FOREIGN KEY in one table points to a PRIMARY KEY in another table.

Check constraint

The CHECK constraint is used to limit the value range that can be placed in a column. If you define a CHECK constraint on a single column it allows only certain values for this column.

Summary



Database commands

- Create a database
- Use a database
- Delete a database
- List all databases

Document commands

- Insert a document
- Show documents
- Delete a document
- Update document

Table commands

- Create a database
- Use a database
- Delete a database
- List all databases

Constraints

- Not Null constraint
- Default constraint
- Unique constraint
- Primary Key constraint
- Foreign Key constraint
- Check constraint

Thank you

1 Data Definition Language(DDL):

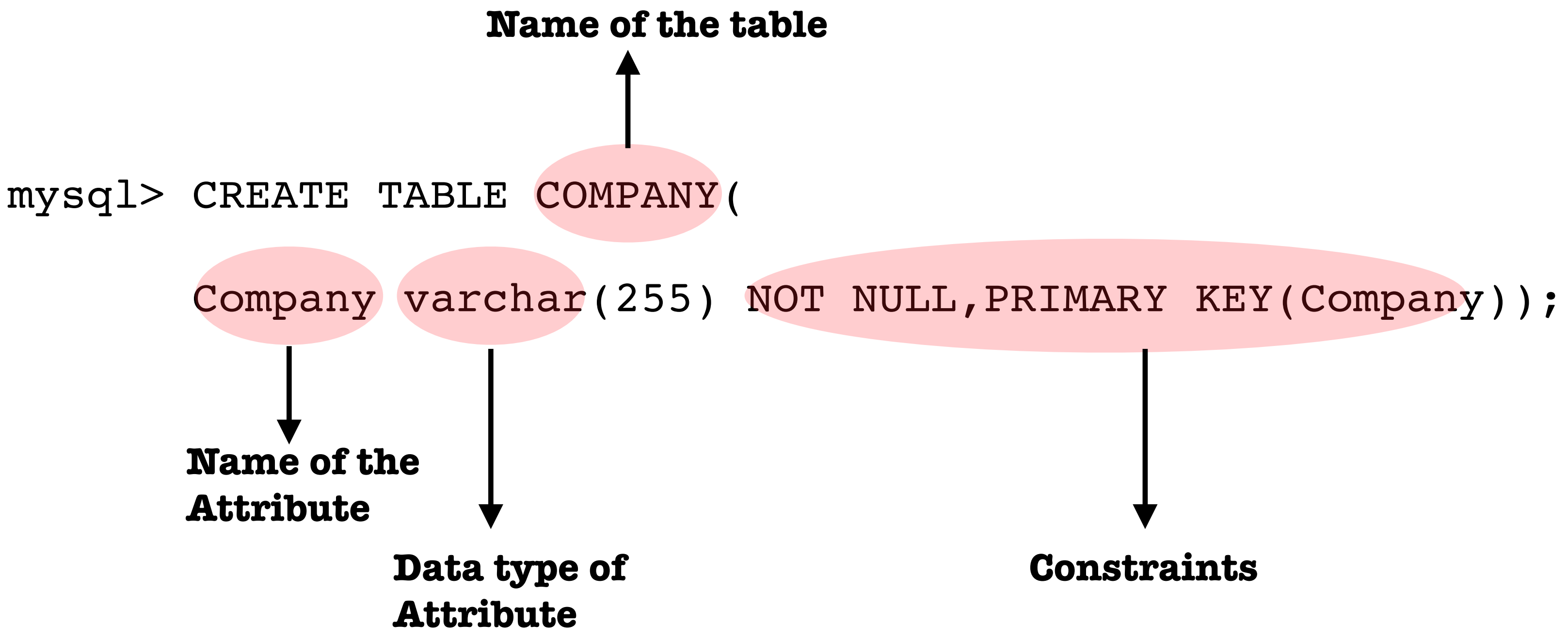
DDL commands

- ✓ Create a table
- Alter a table
- Drop a table

Create a table

- It is used to specify a new relation by giving it a name and specifying its attributes and initial constraints.

- The attributes are specified first, and each attribute is given a name, a data type to specify its domain of values, and any attribute constraints, such as NOT NULL.



```
mysql> CREATE TABLE COMPANY(
       Company varchar(255) NOT NULL,PRIMARY KEY(Company));
```

1 Data Definition Language(DDL):

DDL commands

- ✓ Create a table
- ✓ Alter a table
- ✓ Drop a table

Alter a table

- We can add columns or make changes to table later also by altering the table using ALTER TABLE COMMAND

```
mysql> ALTER TABLE COMPANY ADD Est_year int;
```

Drop a table

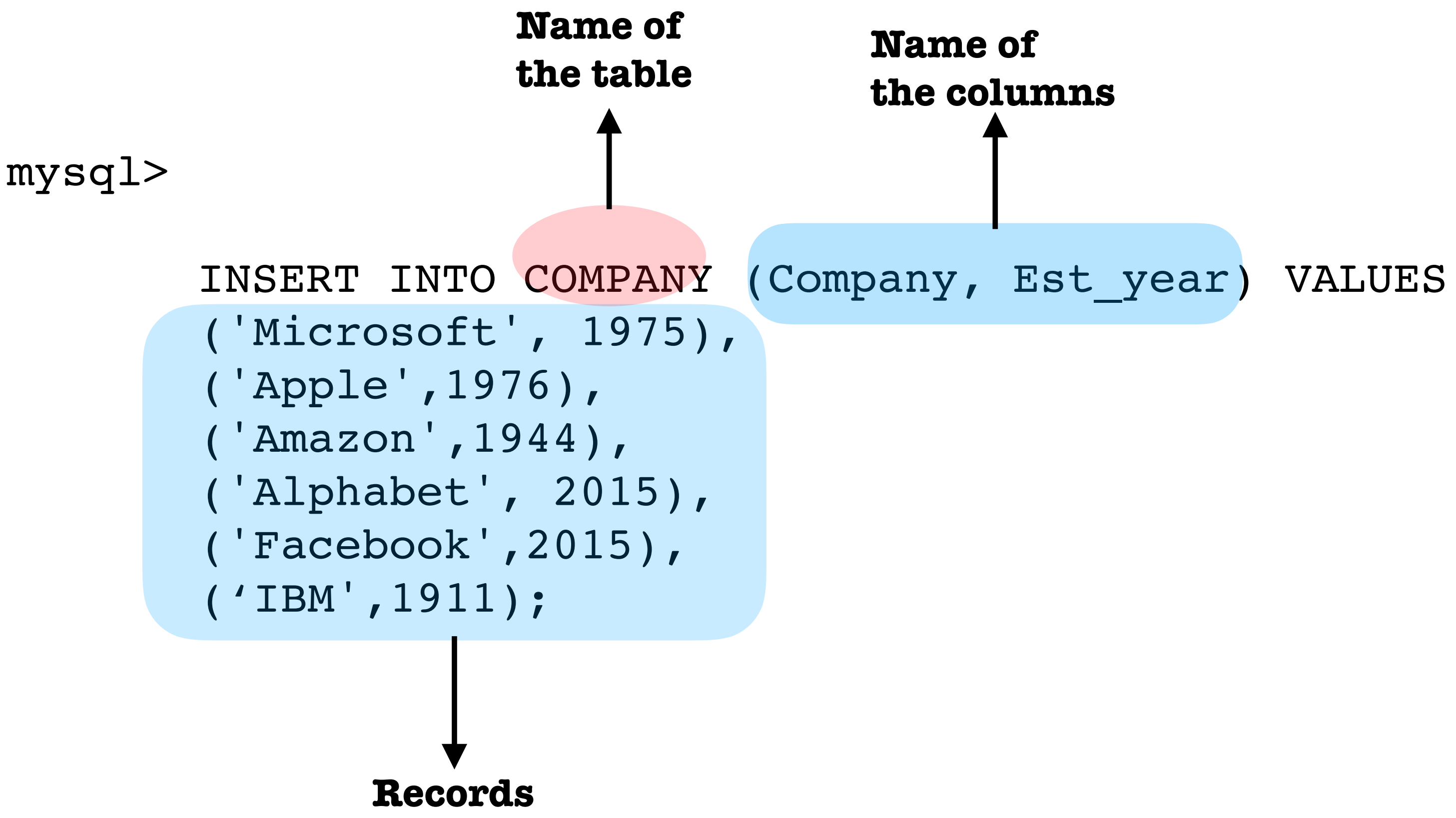
```
mysql> drop table table_name;
```

2 Data Manipulation Langauge(DML)

DML commands

- ✓ Insert into a table
- Update a table
- Delete all data from table

Insert into a table



Name of the table

Name of the columns

```
mysql>

     INSERT INTO COMPANY (Company, Est_year) VALUES
     ('Microsoft', 1975),
     ('Apple',1976),
     ('Amazon',1944),
     ('Alphabet', 2015),
     ('Facebook',2015),
     (‘IBM',1911);
```

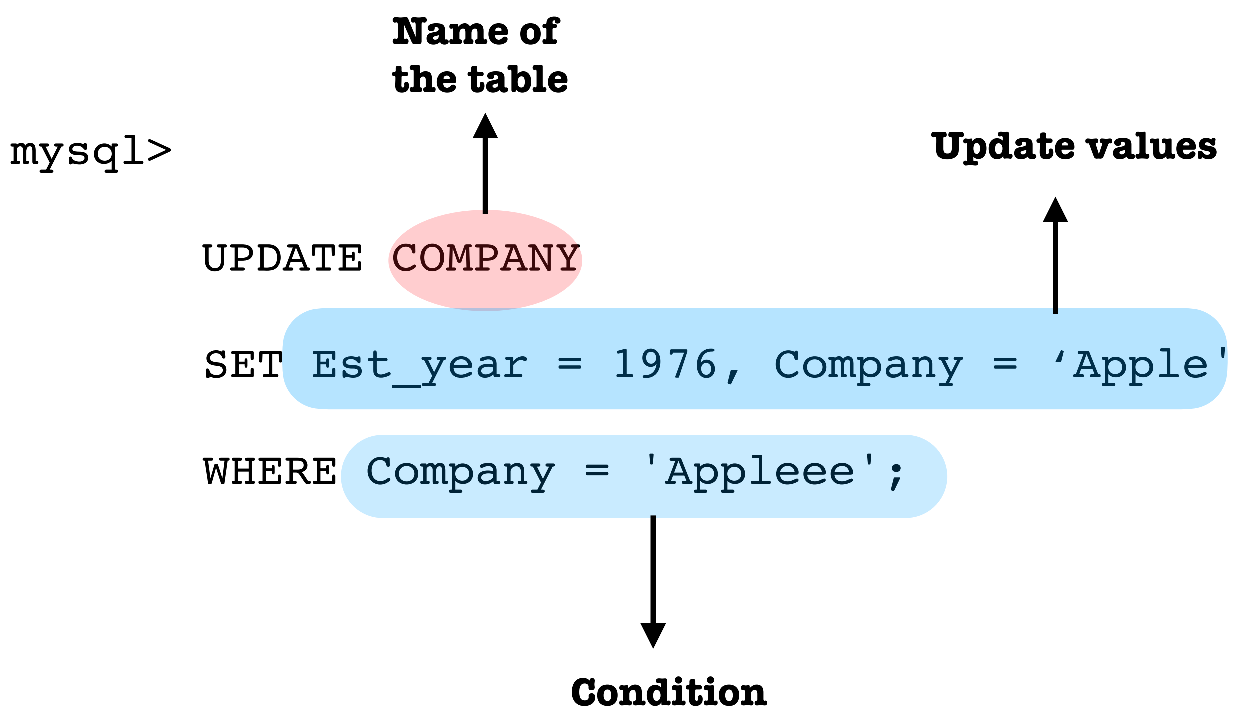
Records

2 Data Manipulation Langauge(DML)

DML commands

- ✓ Insert into a table
- ✓ Update a table
- Delete all data from table

Update a table



```
mysql>

        UPDATE COMPANY
        SET Est_year = 1976, Company = ‘Apple'
        WHERE Company = 'Appleee';
```

2 Data Manipulation Langauge(DML)

DML commands

- ✓ Insert into a table
- ✓ Update a table
- ✓ Delete all data from table

Delete all data from table

- Unlike drop delete will only delete all the entries present in the table but it will retain the table structure

```
mysql>

      Delete from table_name
```

3 Data Query Langauge(DQL)

DQL commands

- ✓ Select
- Show
- Describe

Select

- You can use select command to show the rows present in the table

```
mysql> select * from table_name;
```

- You can use also use select command along with ‘where’ to make conditional query

```
mysql> select * from table_name
       Where column_name = column_value;
```

- You can use also select particular column from a query result.

```
mysql> select column_name from table_name
       Where column_name = column_value;
```

3 Data Query Langauge(DQL)

DQL commands

- ✓ Select
- ✓ Show
- ✓ Describe

Show

- You can use show command to show all the tables present in a particular database

```
mysql> show tables;
```

Describe

- You can use describe command to show all the properties of a table present in the database

```
mysql> describe table_name;
```

constraints

SQL constraints

- ✓ Not Null constraint
- ✓ Default constraint
- Unique constraint
- Primary Key constraint
- Foreign Key constraint
- Check constraint

Not Null constraint

- If you want to create a table with a column where null value shouldn’t be allowed then you can use not null constraint to create such columns

- Let’ say we want there shouldn’t be any null value present for company_name then we can create table as:

```
mysql> CREATE TABLE COMPANY(
       Company varchar(255) NOT NULL );
```

Default constraint

- If user inserts a document in a table and if he does not specify any value for a particular attribute or column then we can assign a default value for it.

- While creating a table you can specify a default value for a column

```
mysql> CREATE TABLE ORG(
       Name varchar(255),
       City varchar(250) Default ‘EARTH’ );
```

constraints

SQL constraints

- ✓ Not Null constraint
- ✓ Default constraint
- ✓ Unique constraint
- Primary Key constraint
- Foreign Key constraint
- Check constraint

Unique constraint

- The UNIQUE constraint ensures that all values in a column are different.

- Both the UNIQUE and PRIMARY KEY constraints provide a guarantee for uniqueness for a column or set of columns.

- A PRIMARY KEY constraint automatically has a UNIQUE constraint.

- However, you can have many UNIQUE constraints per table, but only one PRIMARY KEY constraint per table.

```
mysql> CREATE TABLE Persons(
       ID int NOT NULL UNIQUE,
       LastName varchar(255) NOT NULL,
       FirstName varchar(255),Age int);
```

constraints

SQL constraints

- ✓ Not Null constraint
- ✓ Default constraint
- ✓ Unique constraint
- ✓ Primary Key constraint
- Foreign Key constraint
- Check constraint

Primary Key constraint

- The PRIMARY KEY constraint uniquely identifies each record in a table.
- Primary keys must contain UNIQUE values, and cannot contain NULL values.
- A PRIMARY KEY constraint automatically has a UNIQUE constraint.
- A table can have only ONE primary key;

```
mysql> CREATE TABLE Persons(
       ID int NOT NULL UNIQUE,
       LastName varchar(255) NOT NULL,
       FirstName varchar(255),Age int,
       PRIMARY KEY (ID));
```

constraints

SQL constraints

- ✓ Not Null constraint
- ✓ Default constraint
- ✓ Unique constraint
- ✓ Primary Key constraint
- ✓ Foreign Key constraint
- Check constraint

Foreign Key constraint

- A FOREIGN KEY is a key used to link two tables together.

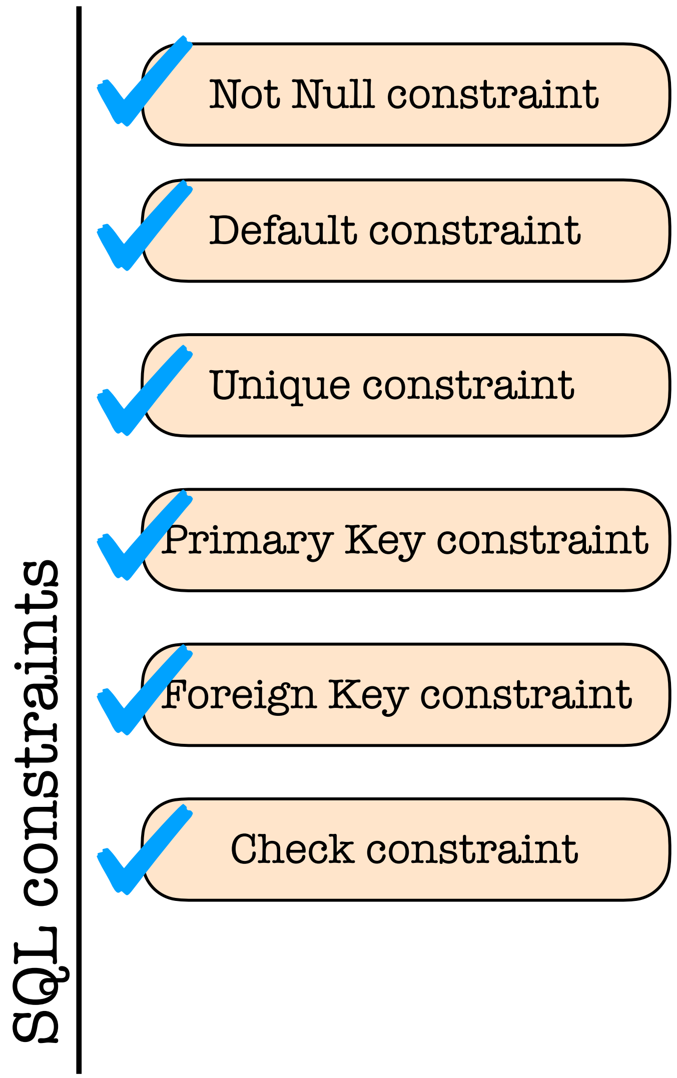
- A FOREIGN KEY is a field (or collection of fields) in one table that refers to the PRIMARY KEY in another table.

- The table containing the foreign key is called the child table, and the table containing the candidate key is called the referenced or parent table..

```
mysql> CREATE TABLE artists (
           id     INTEGER PRIMARY KEY,
           name   TEXT
         );


mysql> CREATE TABLE tracks (
  traid      INTEGER,
  title    TEXT,
  artist INTEGER,
  FOREIGN KEY(artist) REFERENCES artists(id)
);
```

constraints



SQL constraints

- ✓ Not Null constraint
- ✓ Default constraint
- ✓ Unique constraint
- ✓ Primary Key constraint
- ✓ Foreign Key constraint
- ✓ Check constraint

Check constraint

- The CHECK constraint is used to limit the value range that can be placed in a column.

- If you define a CHECK constraint on a single column it allows only certain values for this column.

- The table containing the foreign key is called the child table, and the table containing the candidate key is called the referenced or parent table..

```
mysql> CREATE TABLE Persons (
       ID int NOT NULL,
       LastName varchar(255) NOT NULL,
       FirstName varchar(255),
       Age int,
       CHECK (Age>=18));
```

Thank you