2/10 Class Note

Types of Join/SQL Syntax

- Cross Join
- Natural Join
- Self Join
- Inner Join
- Outer Join
- Left/ Right Join

**resource to help you understand the differences of types of join:* [*https://stackoverflow.com/questions/17946221/sql-join-and-different-types-of-joins*](https://stackoverflow.com/questions/17946221/sql-join-and-different-types-of-joins)

[Basic]

```
SELECT <list of desired fields>
FROM <single table T1>
JOIN <single table T2> ON <T1.c1 = T2.c1>

WHERE <boolean conditions>
ORDER BY <list of fields to sort on>
```

[Inner Join]

```
SELECT *
FROM T1
[INNER] JOIN T2 ON T1.c1 = T2.c1

[INNER] JOIN T3 ON T2.c2 = T3.c2
```

[Left/Right Join]

```
SELECT *
FROM T1
LEFT/RIGHT [OUTER] JOIN T2 ON T1.c1 = T2.c1;
```

[Outer Join]

```
SELECT *
FROM T1
FULL [OUTER] JOIN T2 ON T1.c1 = T2.c1;
```

Table Alias/Column Alias

```
SELECT column_name(s)
FROM table_name [AS] alias_name;

SELECT column_name [AS] alias_name
FROM table_name;
```

```
* Alias is required for Self Join
SELECT DISTINCT(S1.sid)
FROM Student S1
JOIN Student S2
ON S1.sid = S2.sid
WHERE S1.cno = "CS327E" AND S2.cno = "CS327E"
```

Like

The LIKE operator is used in a WHERE clause to search for a specified pattern in a column. There are two wildcards often used in conjunction with the LIKE operator:

- % - The percent sign represents zero, one, or multiple characters
- _ - The underscore represents a single character

Count

- SELECT COUNT(*) - will count the number of non-NULL items in the specified column (NULL fields will be ignored).
- SELECT COUNT(1) - will return the total of all records returned in the result set regardless of NULL values.

Lucidchart: Creating ERD

ERD = Entity Relationship Diagram
You can find Set-up guide in GitHub repository - Snippets

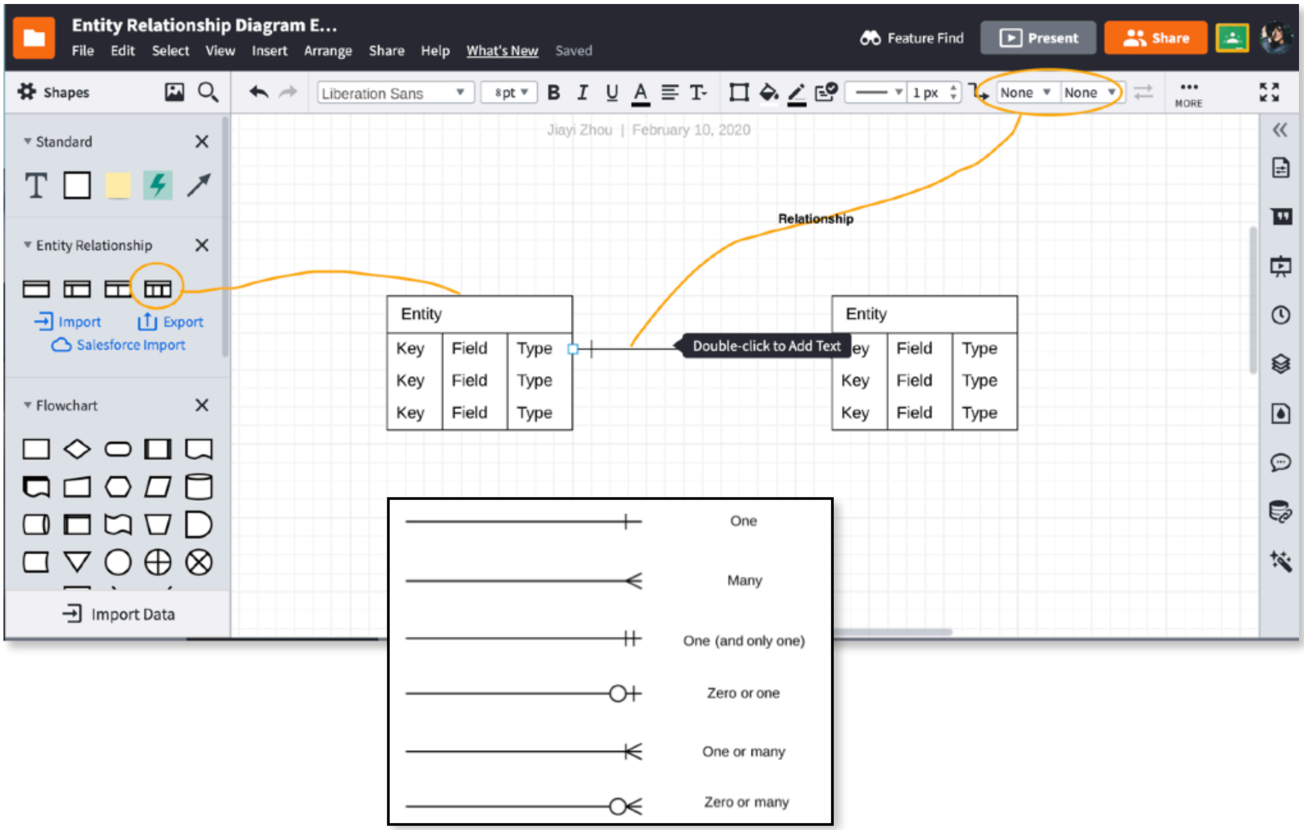
Document->ERD->Entity Relationship->3-column Entity
Entity = table name
Field = column name

How to decide the PK of a table?

- Using SELECT COUNT(*) and SELECT COUNT(distinct <col_name>) on the same table
- If two results are matched, then this column can be the primary key of the table

How to decide the FK of a table that relates to another table?

- Say we are working on T2, and check if the FK in T2 refers to PK in T1
- Using SELECT COUNT(*) FROM t2 LEFT JOIN t1 ON t2.fk = t1.pk WHERE t1.pk IS NULL;
- If the result is 0, then there is not violation.
- The idea is that each value in the column that is foreign key must refer to the value in the column that is primary key in another table. (Set of values of FK is a subset of set of values of PK). If there is a value in T2.fk that cannot find a same value in T1.pk, then the result table of JOIN operation contains NULL value.



Entity		
Key	Field	Type
Key	Field	Type
Key	Field	Type

Entity		
ey	Field	Type
Key	Field	Type
Key	Field	Type