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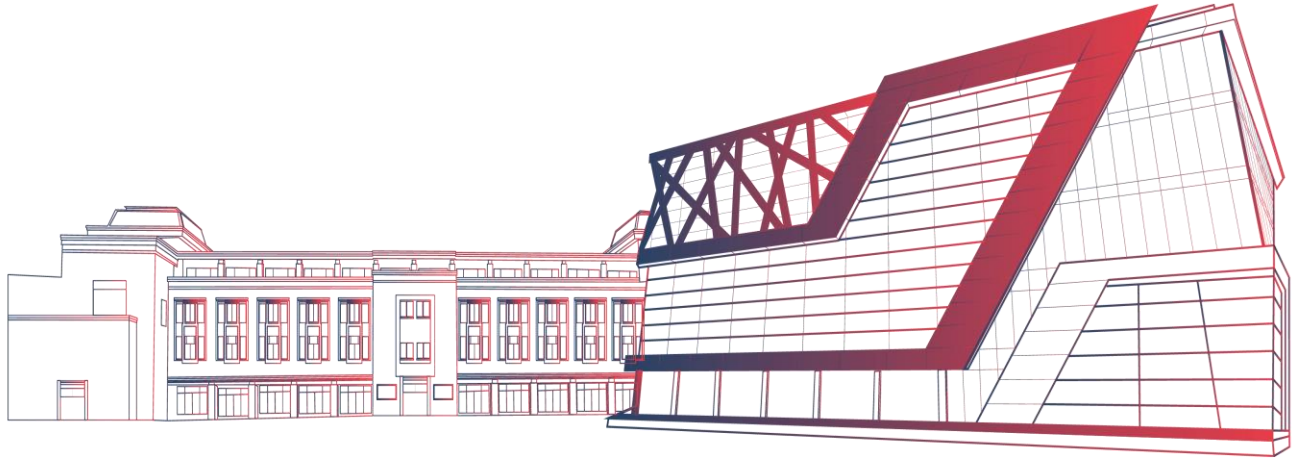
Lecture-4
Integrity Constraints



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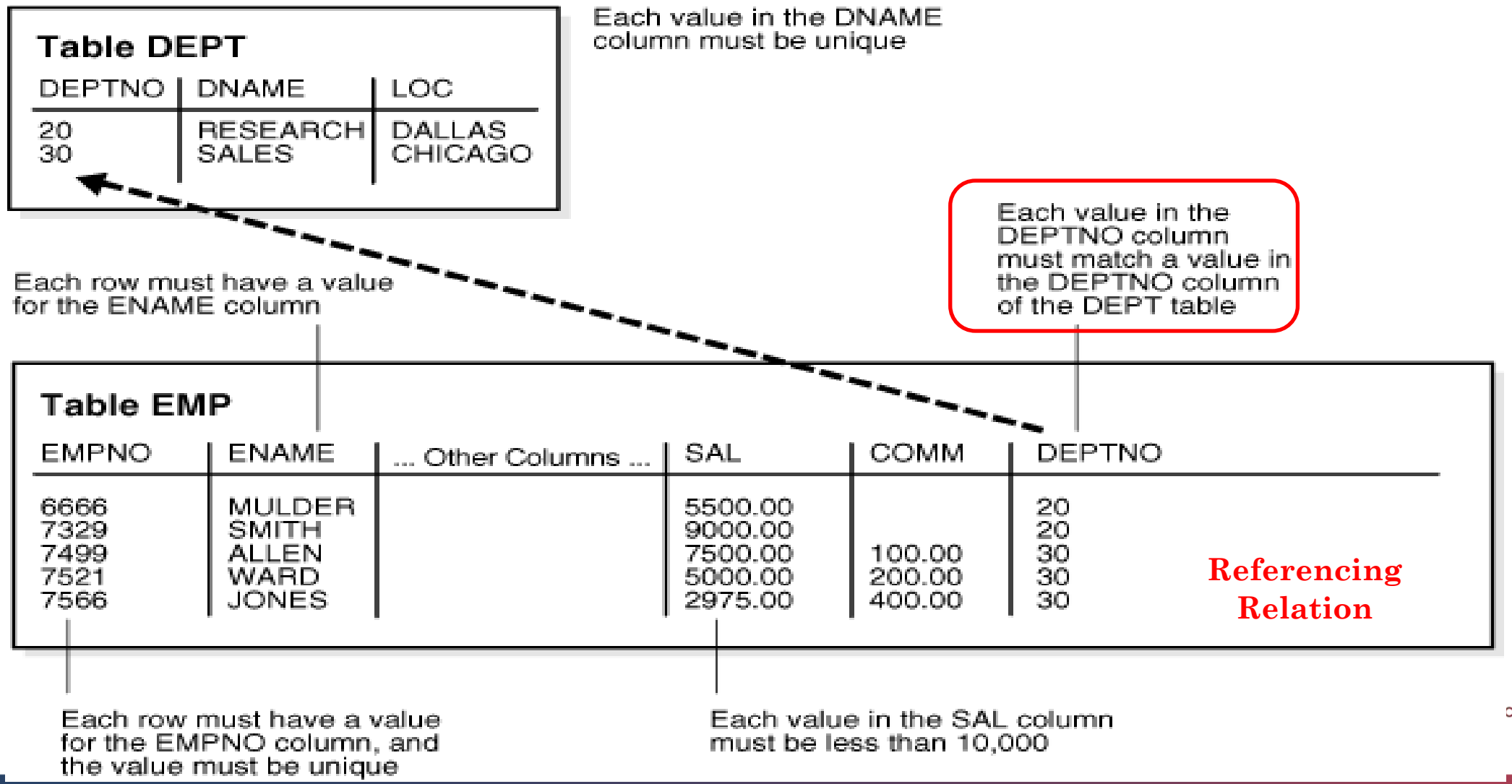
Integrity Constraints

Referential Integrity Constraint



Referential Integrity Constraint (Cont.)

- Tuples in the **referencing relation** R1 have attributes FK (called **foreign key** attributes) that reference the primary key attributes PK of the **referenced relation** R2.

A tuple t1 in R1 is said to reference a tuple t2 in R2 if t1[FK] = t2[PK].

- The value in the foreign key column (or columns) i.e. FK of the the **referencing relation** R1 can be **either**:

a) **a value of an existing primary key value of a corresponding primary key PK in the referenced relation R2,**

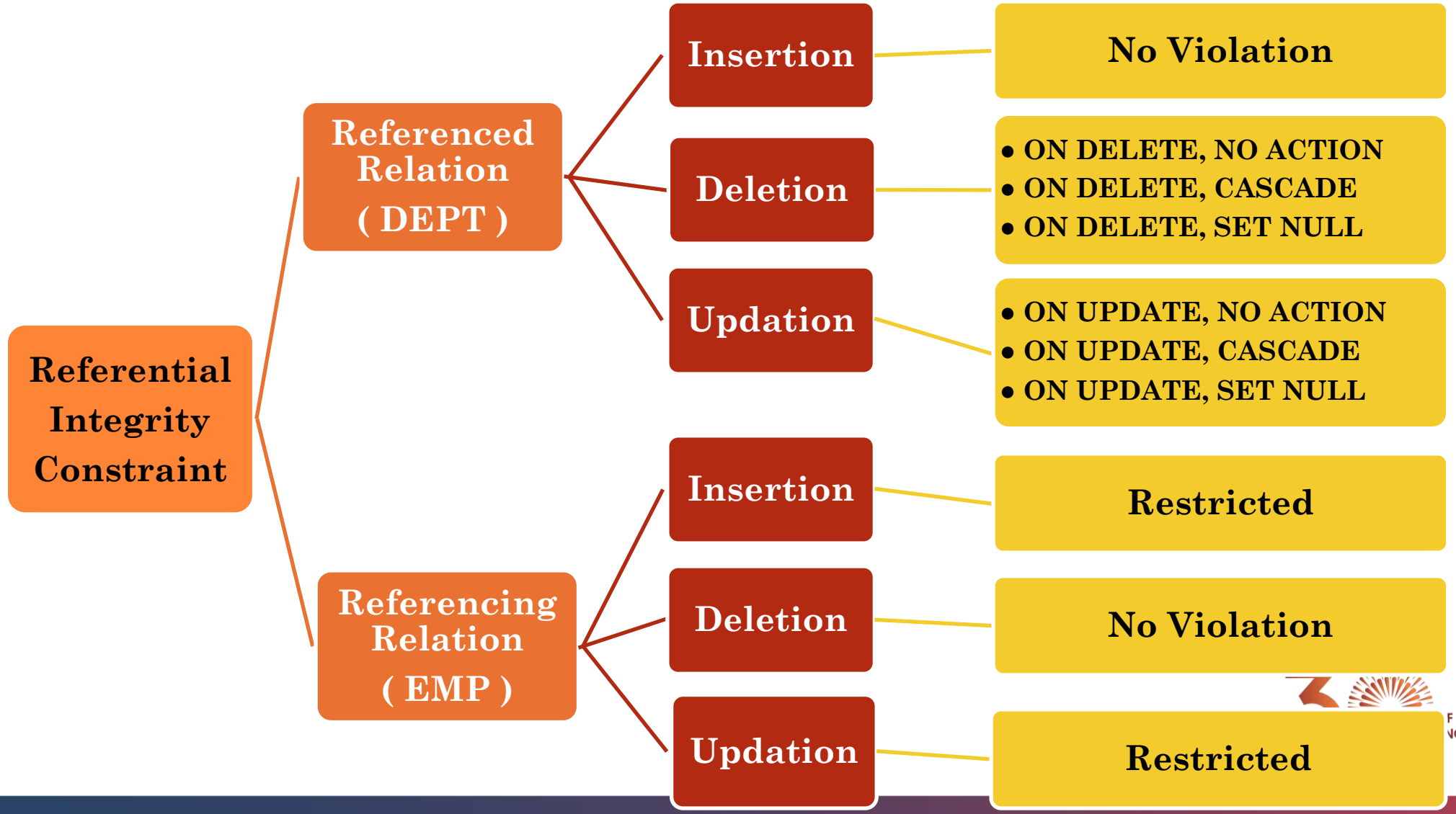
or

b) **a null.**

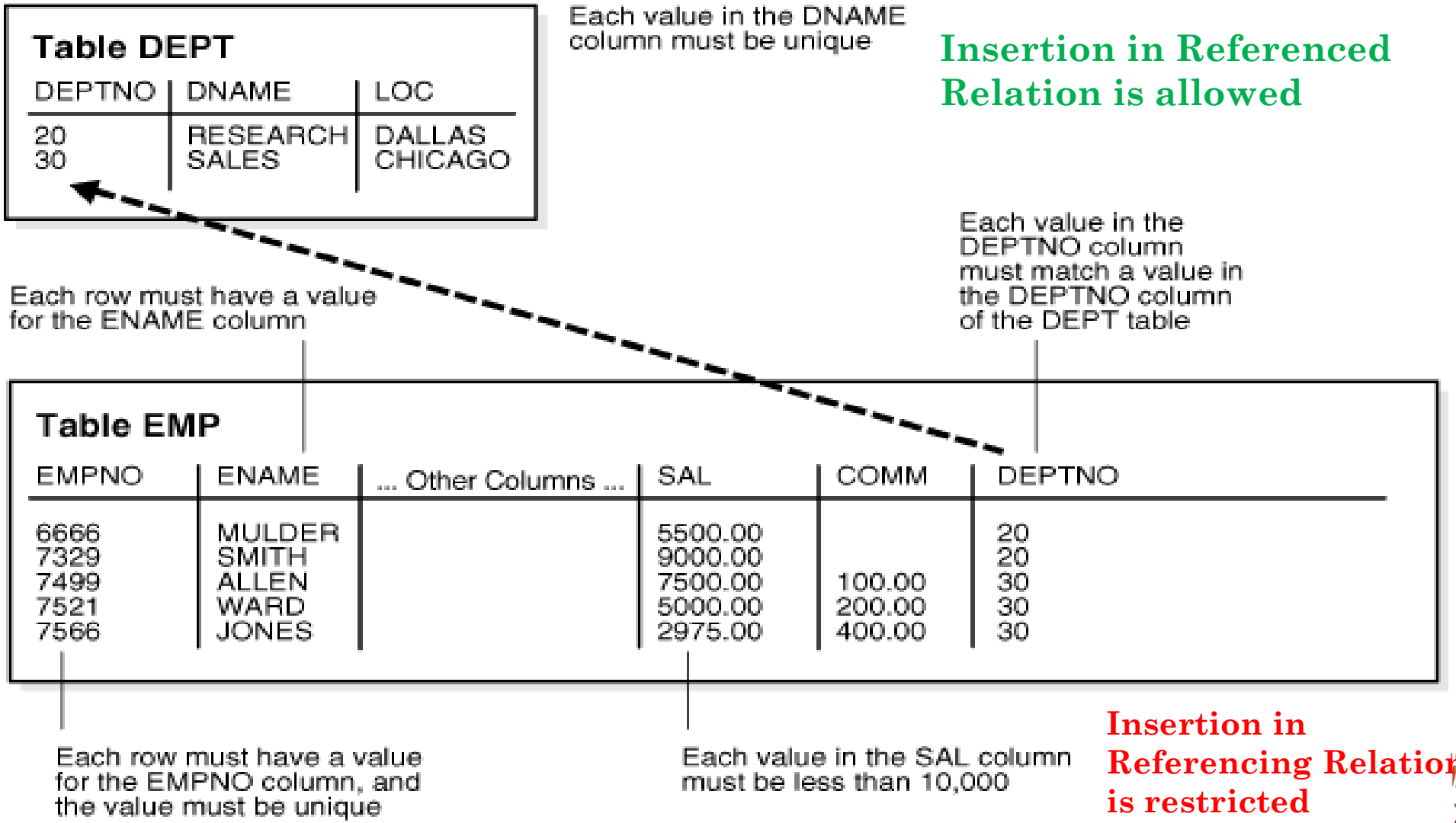
Referential Integrity Constraints

Referential integrity also includes the rules that dictate what types of data manipulation are allowed on referenced values and how these actions affect dependent values.

Referential Integrity Constraints



Referential Integrity Constraint - INSERTION



Insertion in Referenced Relation is allowed

Insertion in Referencing Relation is restricted

Deletion/Updation in Referenced Relation

ON DELETE, CASCADE

ON UPDATE, CASCADE

Table DEPT

DEPTNO	DNAME	LOC
20	RESEARCH	DALLAS
30	SALES	CHICAGO

Cascading

Each row must have a value for the ENAME column

Table EMP

EMPNO	ENAME	... Other Columns ...	SAL	COMM	DEPTNO
6666	MULDER		5500.00		20
7329	SMITH		9000.00		20
7499	ALLEN		7500.00	100.00	30
7521	WARD		5000.00	200.00	30
7566	JONES		2975.00	400.00	30

Deletion/Updation in Referenced Relation

ON DELETE, SET NULL

ON UPDATE, SET NULL

Table DEPT

DEPTNO	DNAME	LOC
20	RESEARCH	DALLAS
30	SALES	CHICAGO

Each row must have a value for the ENAME column

Table EMP

EMPNO	ENAME	... Other Columns ...	SAL	COMM	DEPTNO
6666	MULDER		5500.00		20
7329	SMITH		9000.00		20
7499	ALLEN		7500.00	100.00	30
7521	WARD		5000.00	200.00	30
7566	JONES		2975.00	400.00	30

null

Deletion/Updation in Referenced Relation

ON DELETE, NO ACTION

ON UPDATE, NO ACTION

Table DEPT

DEPTNO	DNAME	LOC
20	RESEARCH	DALLAS
30	SALES	CHICAGO

Each row must have a value for the ENAME column

Table EMP

EMPNO	ENAME	... Other Columns ...	SAL	COMM	DEPTNO
6666	MULDER		5500.00		20
7329	SMITH		9000.00		20
7499	ALLEN		7500.00	100.00	30
7521	WARD		5000.00	200.00	30
7566	JONES		2975.00	400.00	30

Deletion in Referencing Relation

Table DEPT

DEPTNO	DNAME	LOC
20	RESEARCH	DALLAS
30	SALES	CHICAGO

Each row must have a value for the ENAME column

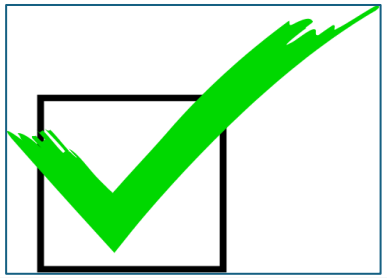


Table EMP

EMPNO	ENAME	... Other Columns ...	SAL	COMM	DEPTNO
6666	MULDER		5500.00		20
7329	SMITH		9000.00		20
7499	ALLEN		7500.00	100.00	30
7521	WARD		5000.00	200.00	30
7566	JONES		2975.00	400.00	30

Updation in Referencing Relation

Table DEPT

DEPTNO	DNAME	LOC
20	RESEARCH	DALLAS
30	SALES	CHICAGO

Each row must have a value for the ENAME column

Table EMP

EMPNO	ENAME	... Other Columns ...	SAL	COMM	DEPTNO
6666	MULDER		5500.00		20
7329	SMITH		9000.00		20
7499	ALLEN		7500.00	100.00	30
7521	WARD		5000.00	200.00	30
7566	JONES		2975.00	400.00	30

Primary key vs Foreign Key

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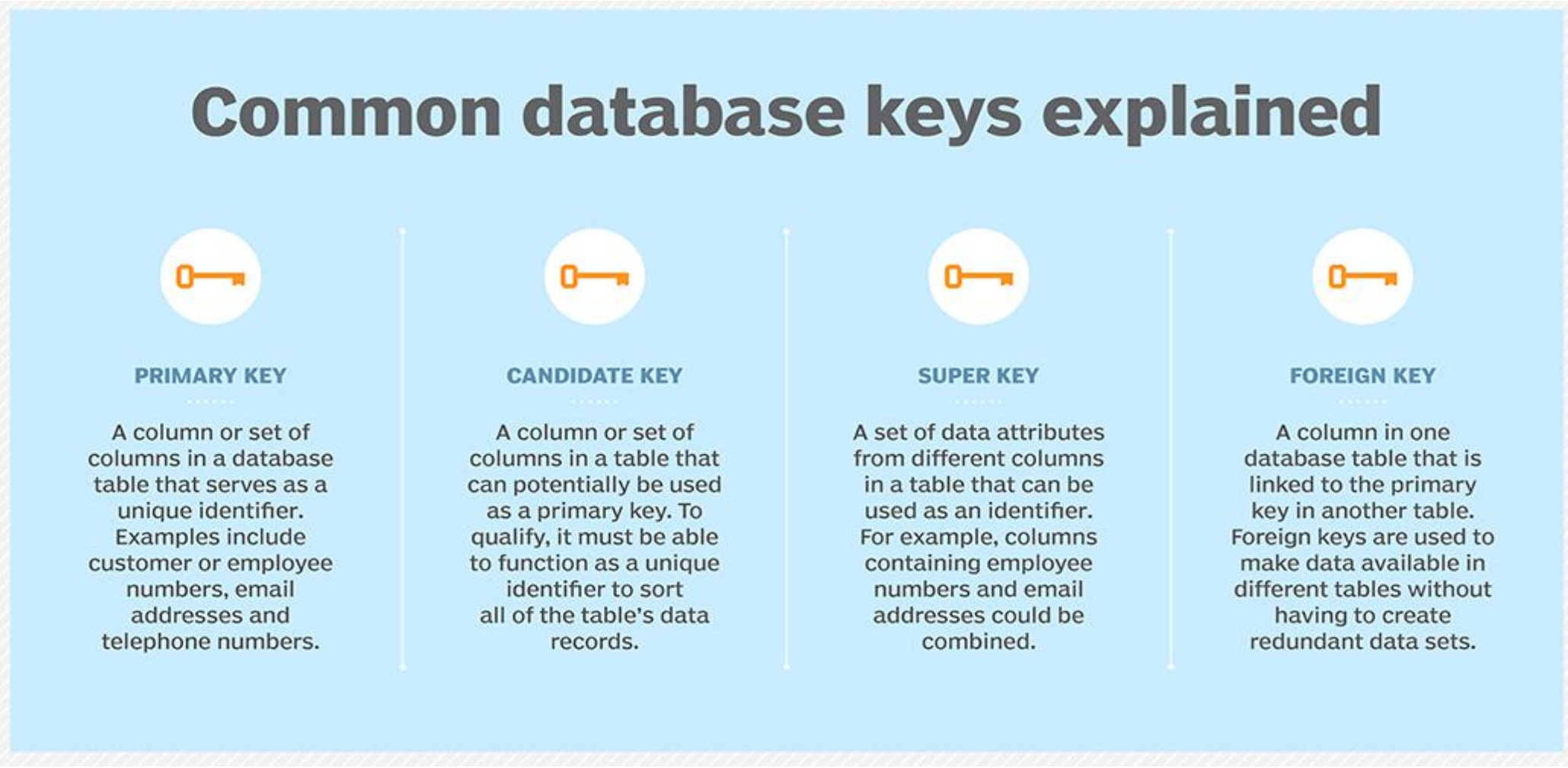
Primary Key	Foreign Key
• Helps you to uniquely identify a record in the table.	• It is a field in the table that is the primary key of another table.
• Primary Key never accept null values.	• A foreign key may accept multiple null values.
• Primary key is a clustered index and data in the DBMS table are physically organized in the sequence of the clustered index.	• A foreign key cannot automatically create an index, clustered or non-clustered. However, you can manually create an index on the foreign key.
• You can have the single Primary key in a table.	• You can have multiple foreign keys in a table.

Summary


Common database keys explained
PRIMARY KEY
A column or set of columns in a database table that serves as a unique identifier. Examples include customer or employee numbers, email addresses and telephone numbers.
CANDIDATE KEY
A column or set of columns in a table that can potentially be used as a primary key. To qualify, it must be able to function as a unique identifier to sort all of the table's data records.
SUPER KEY
A set of data attributes from different columns in a table that can be used as an identifier. For example, columns containing employee numbers and email addresses could be combined.
FOREIGN KEY
A column in one database table that is linked to the primary key in another table. Foreign keys are used to make data available in different tables without having to create redundant data sets.

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Thanks!!

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