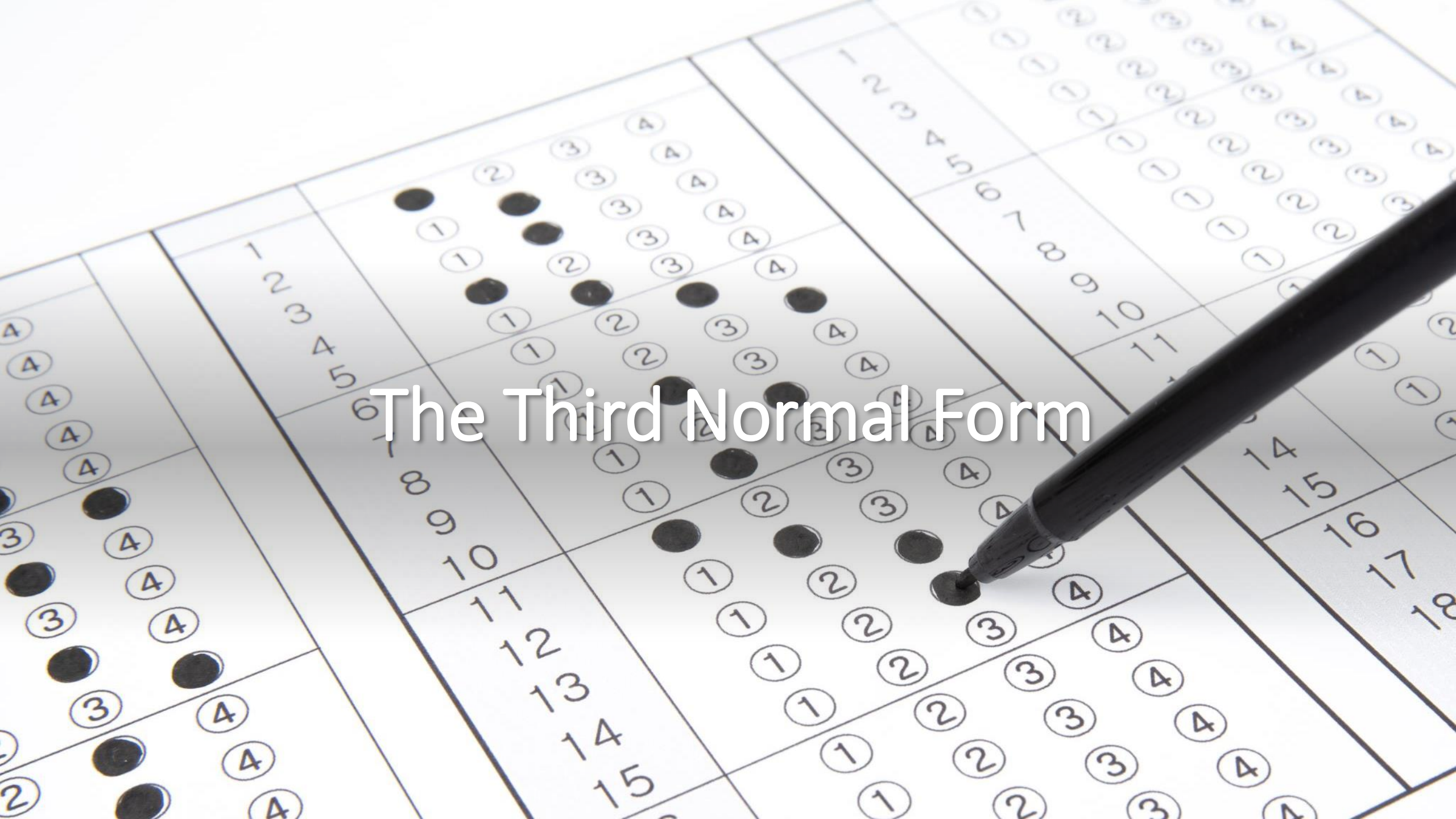


The Third Normal Form



Third Normal Form Definition

- All Tables are in 2nd Normal Form.
- It contains only columns that are non-transitively dependent on the primary key.

Let me explain...





Transitive

When something is *transitive*, then a meaning or relationship is the same in the middle as it is across the whole.



Transitive

10 is greater than 5...

5 is greater than 3...

➤ Therefore

10 is greater than 3

Transitive

In this case, the greater than comparison is transitive. In general, if **A** is *greater* than **B**, and **B** is *greater* than **C**, then it follows that **A** is *greater* than **C**.

A

B

C

Said Another Way...

If Mary is older than Bob, and Bob is older than Ramesh, then Mary is older than Ramesh.





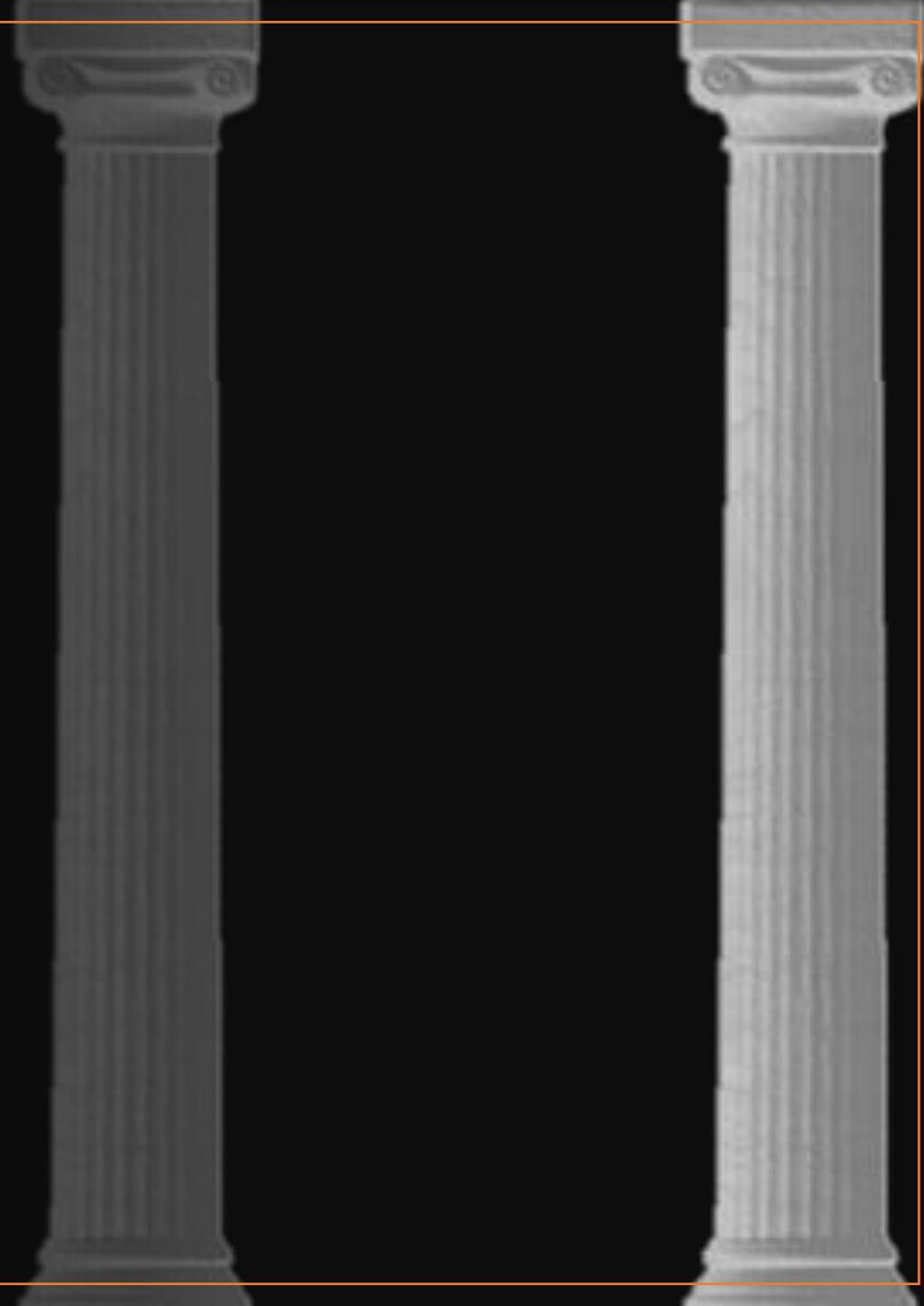
Dependence

An object has a dependence on another object when it relies upon it.

Dependence

In the case of databases, when we say that a column has a dependence on another column, we mean that the value can be derived from the other.

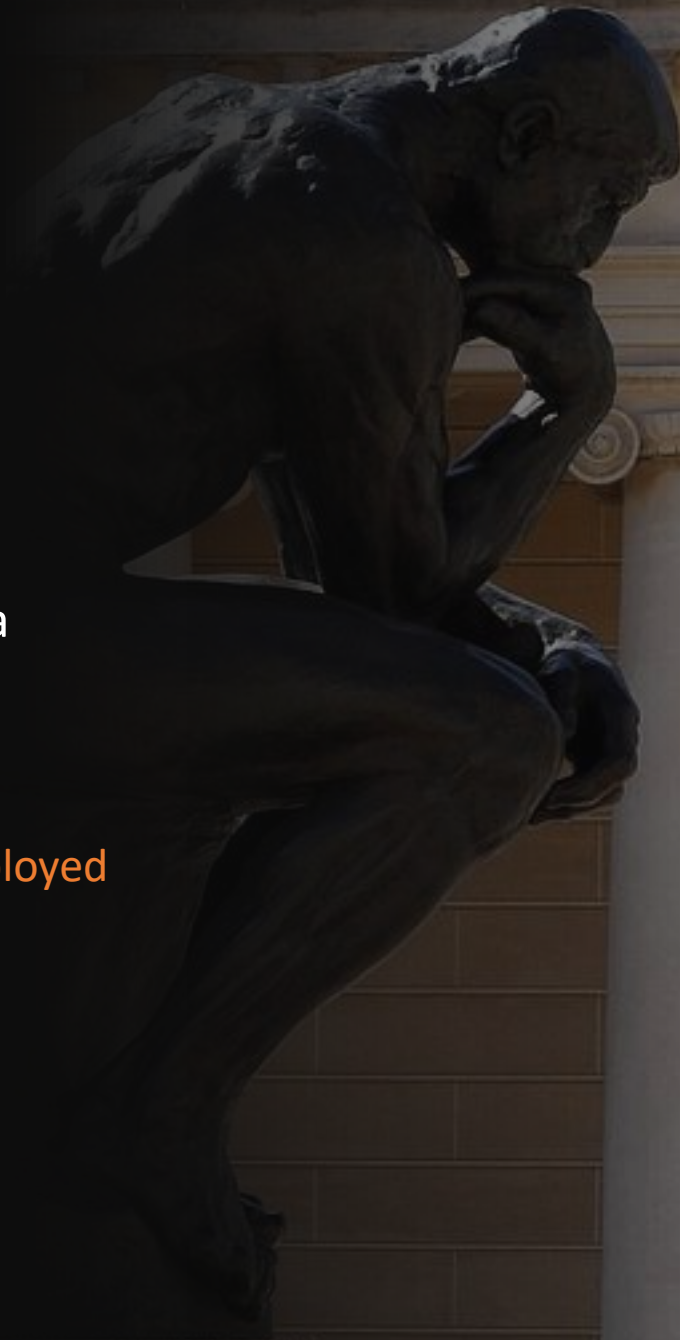
For example, my age is dependent on my birthday.



Transitive Dependence

I think it is simplest to think of transitive dependence to mean a column's value *relies* upon another column *through* a second intermediate column.

Employee Number ← Hire Date ← Years Employed



Transitive Dependence Example

Primary Key	Column A	Column B	Transitive Dependence?
Person ID	First Name	Last Name	No

Transitive Dependence Example

Primary Key	Column A	Column B	Transitive Dependence?
Person ID	Body Mass Index	Is Overweight	Yes

Transitive Dependence Example

Primary Key	Column A	Column B	Transitive Dependence?
Person ID	Weight	Sex	No

Transitive Dependence Example

Primary Key	Column A	Column B	Transitive Dependence?
Vehicle ID	Model	Manufacturer	Yes

Transitive Dependence Example

Primary Key	Column A	Column B	Transitive Dependence?
Person ID	Initials	First Name	Yes

Transitive Dependence Wrap-up

To be non-transitively dependent, then, means that all the columns are dependent on the primary key (a criteria for 2nd normal form) and no other columns in the table.



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