Table Operations:
Schemas, Constraints and Keys

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Agenda

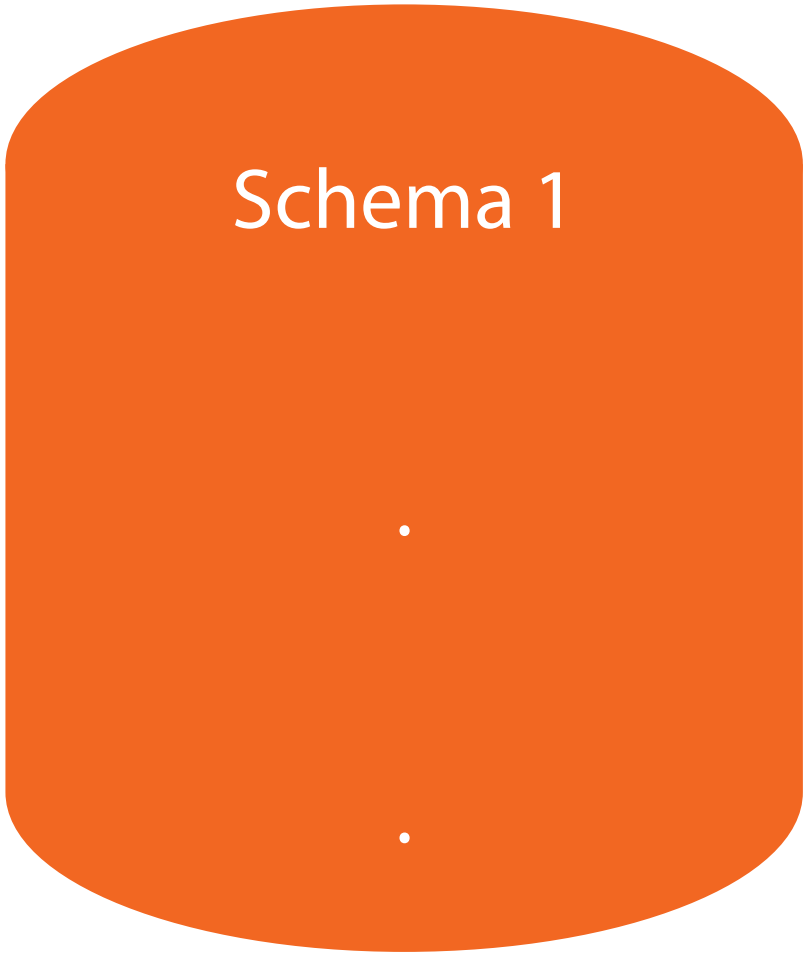
- Schemas
- Constraints and Keys
  - Check Constraint
  - Not-Null Constraint
  - Unique Constraint
  - Keys - Primary and Foreign
- Real World Scenarios

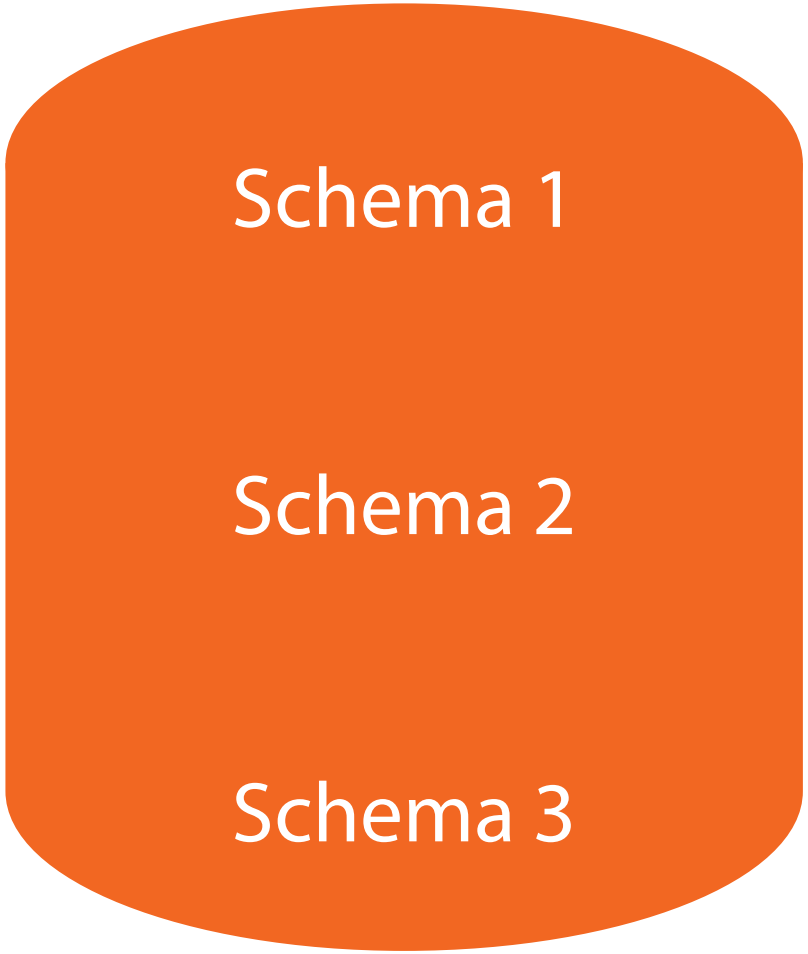
Table Operations

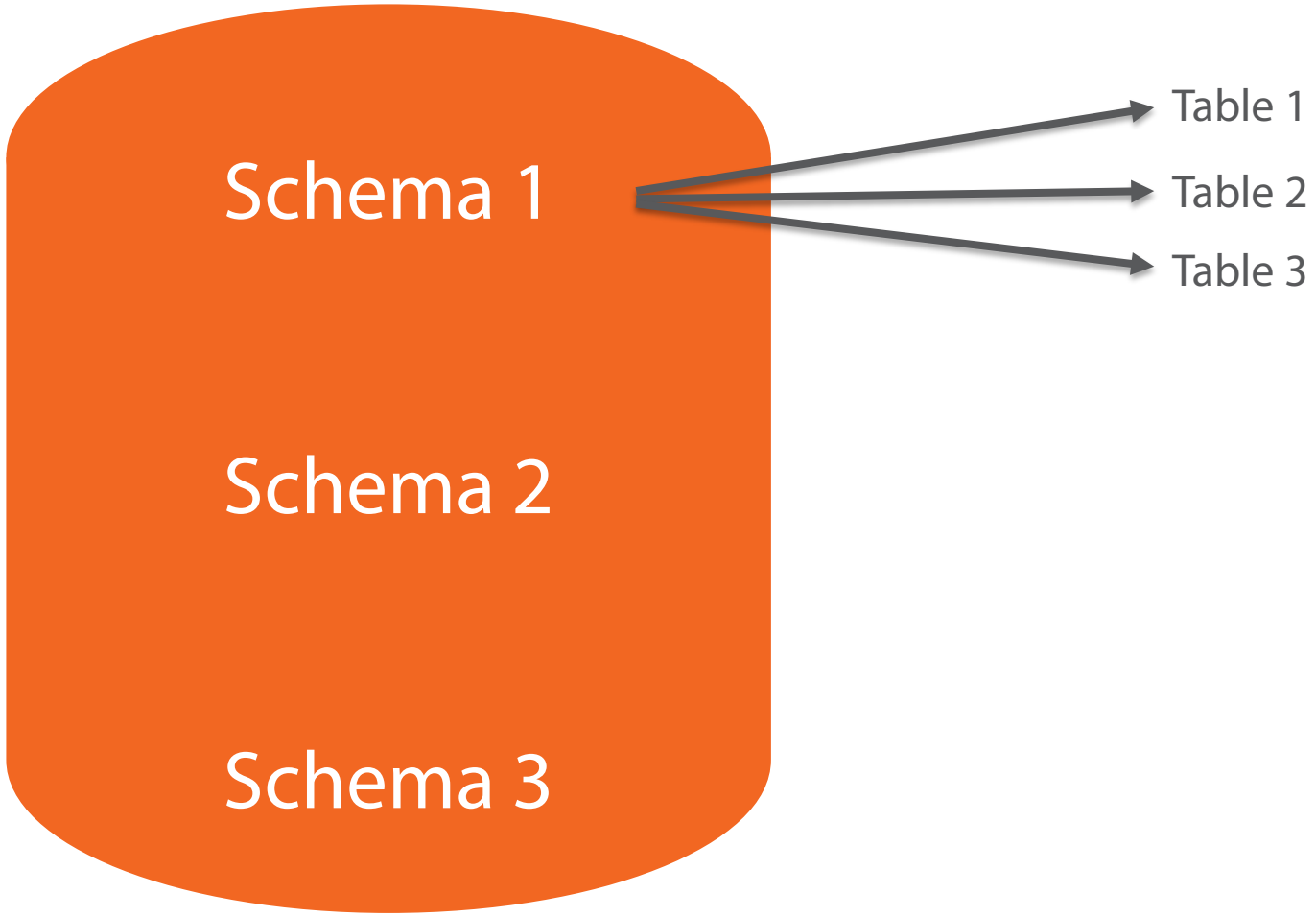
Schemas

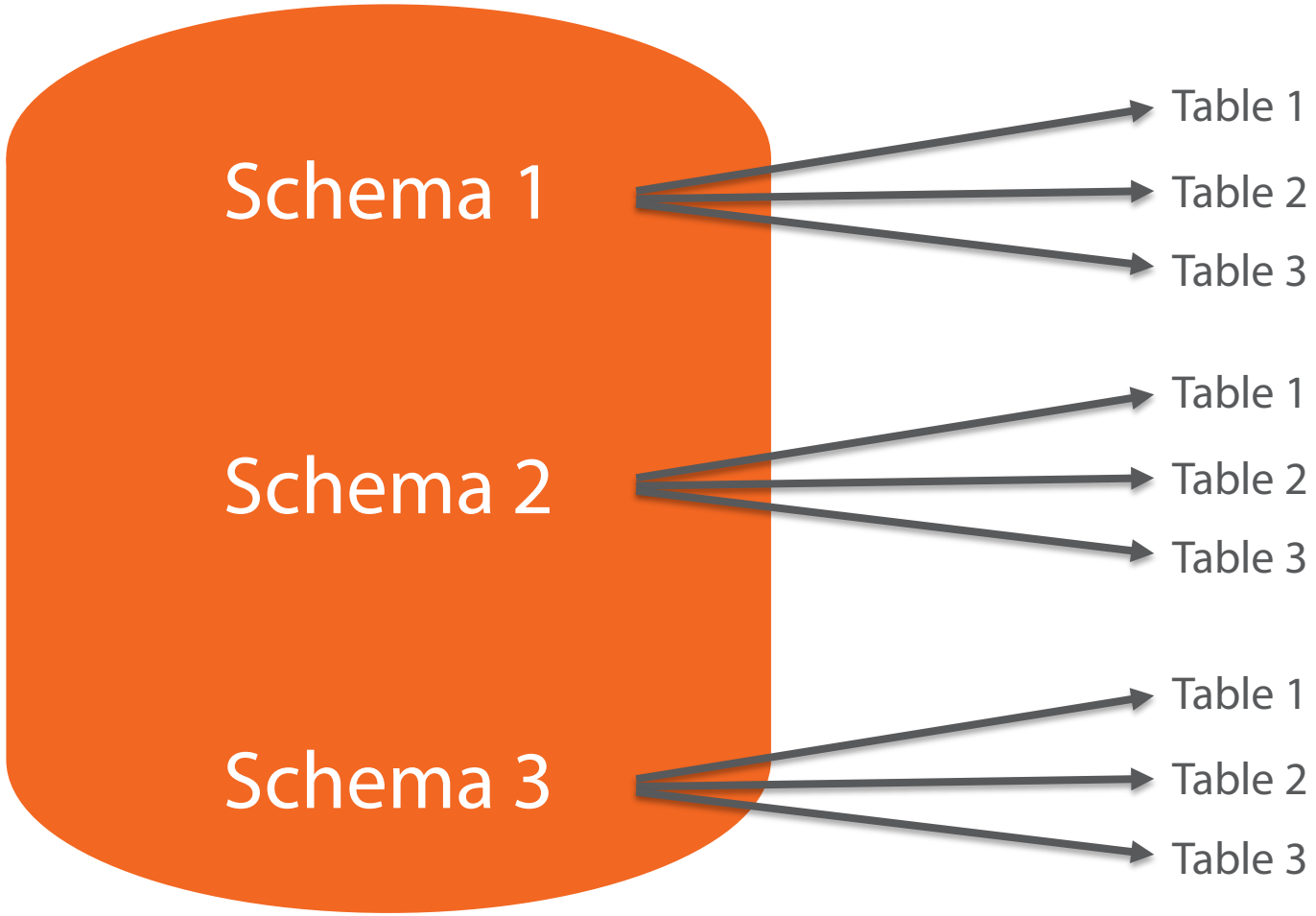
What is a Schema?

A schema is essentially a namespace, which contains named objects like tables, data types, functions, and operators.









Reasons to Use Schemas

- Allows many users to use one database
- Organizes database objects into logical groups
- Objects with same name does not conflict if placed in different schema

Real World Scenarios

Demonstrations

Scenario Setup

Scenario Setup

Beth
Sr. DBA

Troy
Intern

Scenario Setup

Beth
Sr. DBA

Troy
Intern

Scenario 1: Two Different Schema with Same TableName

- Story: Beth asks Troy to create two identical tables for two different organizations. 1) OrangeInc 2) AlmondInc
- Name of the table: Employee
  - ID (Int)
  - EmployeeName (Varchar (256))
  - Age (Int)

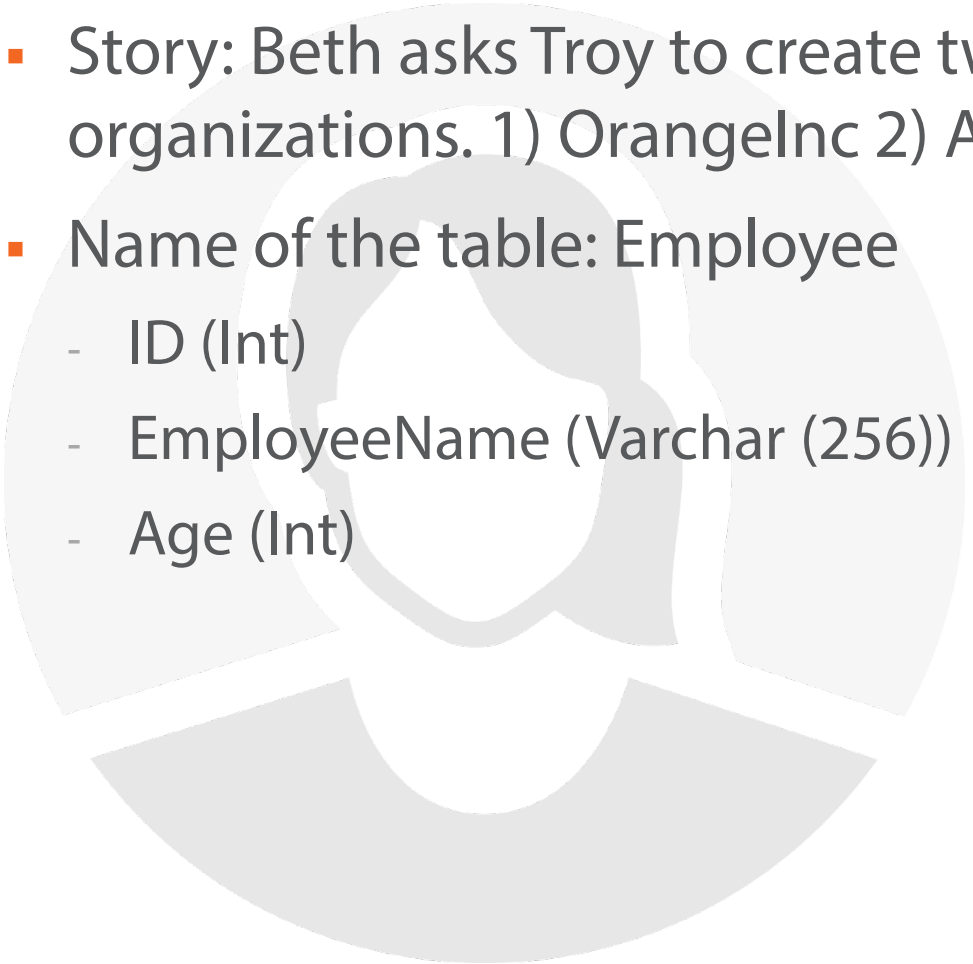


Table Operations

Constraints and Keys

What is a Constraint?

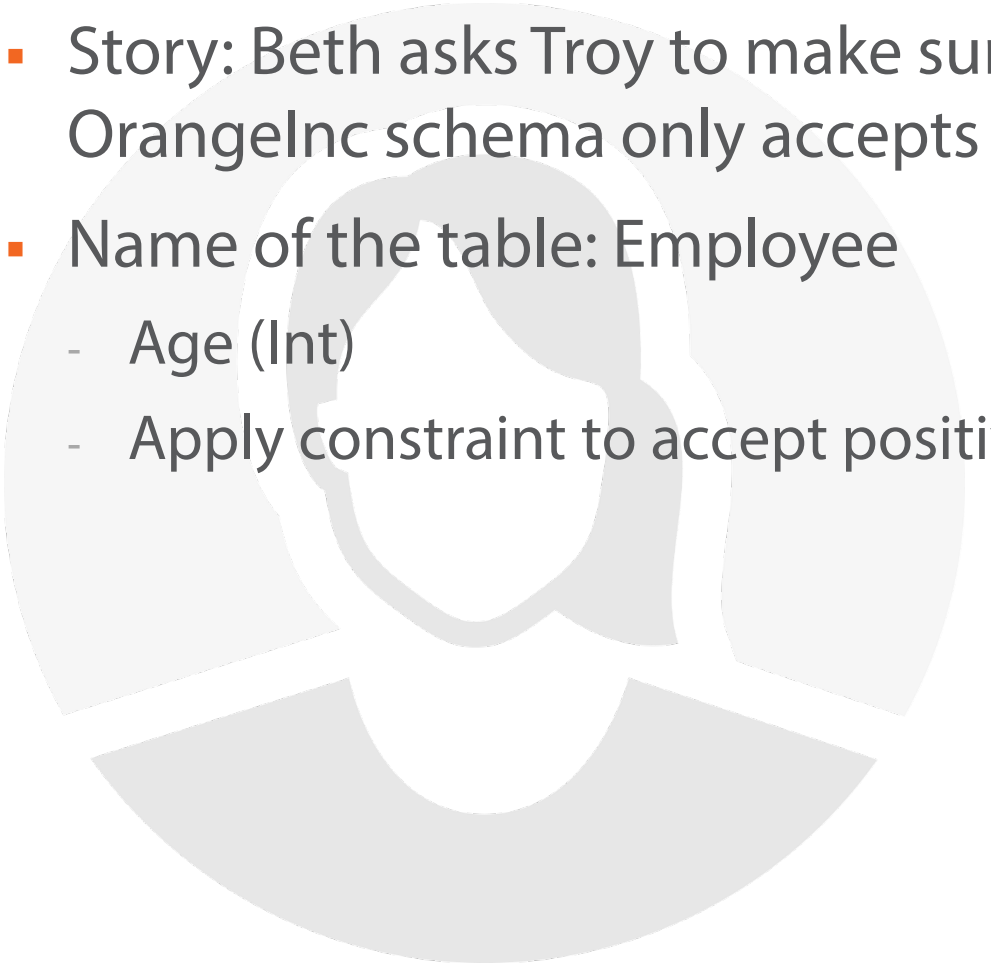
Constraints are the rules enforced on data columns on table.

What is a Check Constraints?

A check constraint allows user to specify that the value in a certain column must satisfy a Boolean expression.

Scenario 2: Check Constraint and Error

- Story: Beth asks Troy to make sure that column Age in Employee table of OrangeInc schema only accepts positive integers
- Name of the table: Employee
  - Age (Int)
  - Apply constraint to accept positive values



What is a Not-Null Constraint?

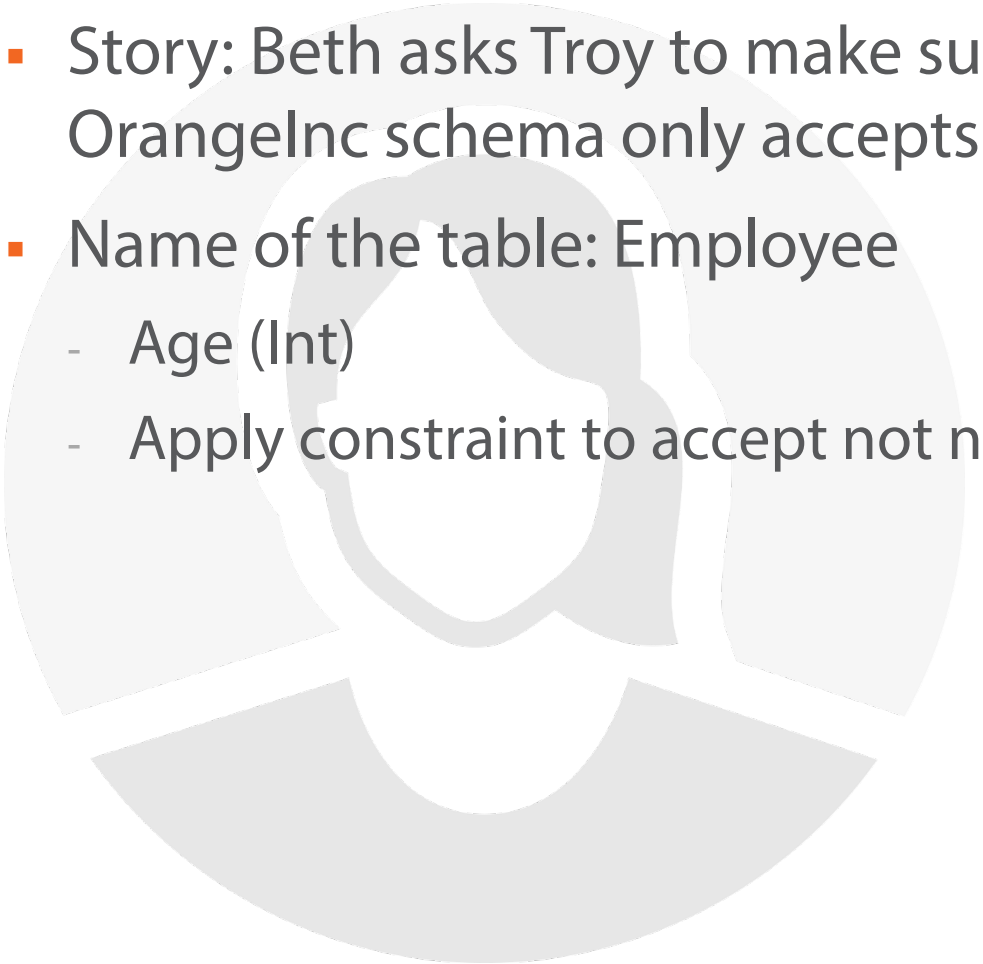
A not-null constraint simply specifies that a column must not assume the null value.

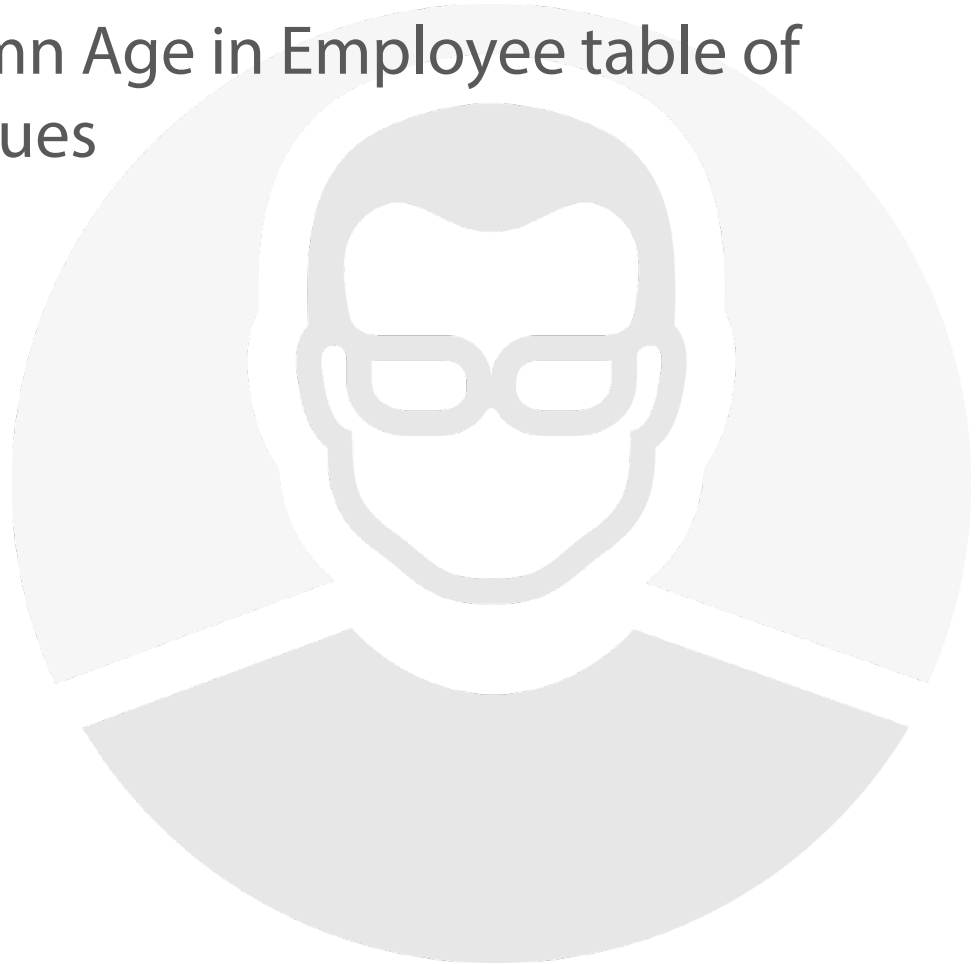
A not-null constraint is functionally equivalent to creating a check constraint CHECK (column_name IS NOT NULL), but in PostgreSQL creating an explicit not-null constraint is more efficient.

— Remember

Scenario 3: Not-Null Constraint and Error

- Story: Beth asks Troy to make sure that column Age in Employee table of OrangeInc schema only accepts Not-Null values
- Name of the table: Employee
  - Age (Int)
  - Apply constraint to accept not null values





What is a Unique Constraint?

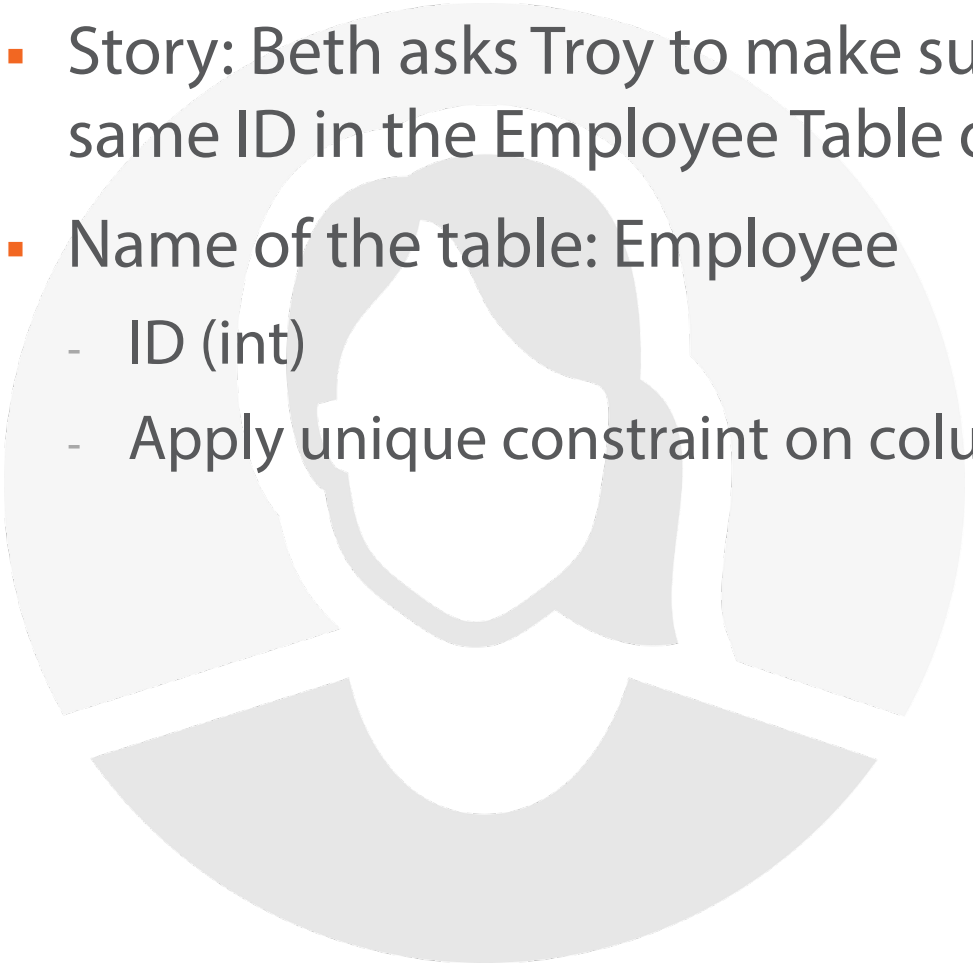
Unique constraints ensure that the data contained in a column or a group of columns is unique with respect to all the rows in the table.

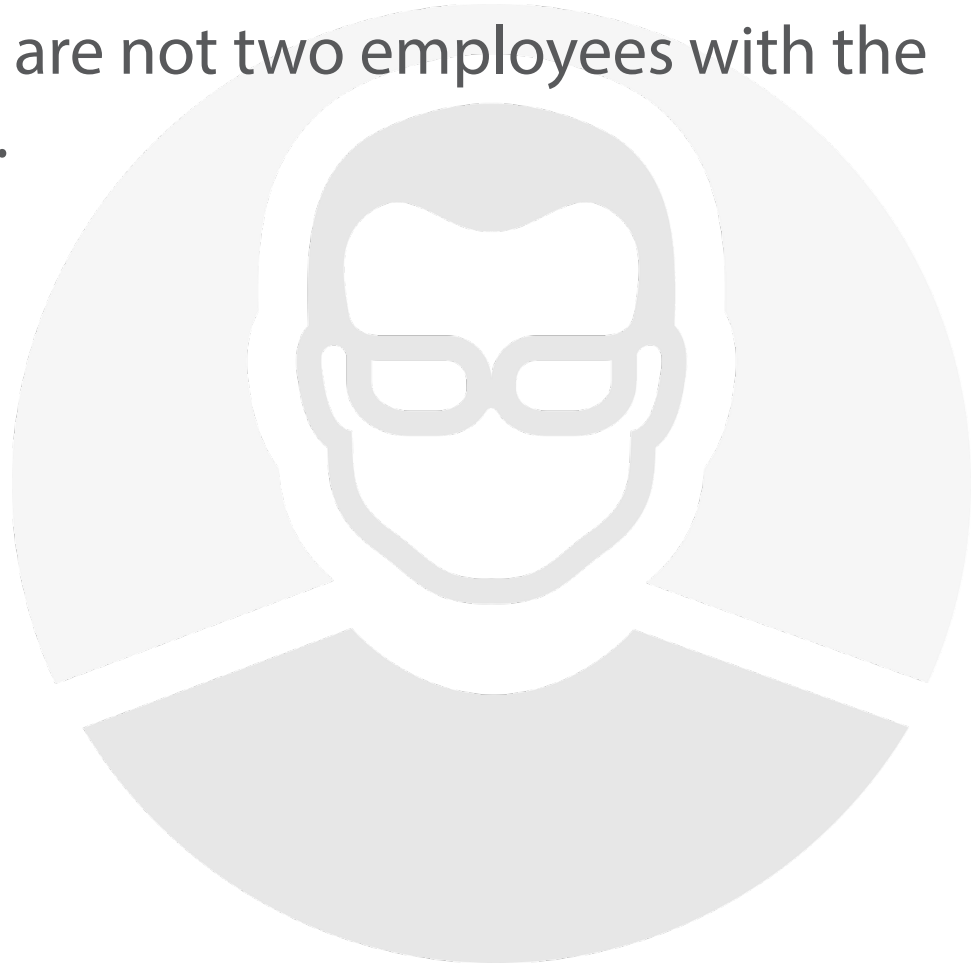
Null values are not considered equal in comparison with Unique Constraint.

— Remember

Scenario 4: Unique Constraint and Error

- Story: Beth asks Troy to make sure that there are not two employees with the same ID in the Employee Table of OrangeInc.
- Name of the table: Employee
  - ID (int)
  - Apply unique constraint on column ID





What is a Primary Key?

The ***Primary Key*** constraint uniquely identifies each record in a database table.

Properties of Primary Keys

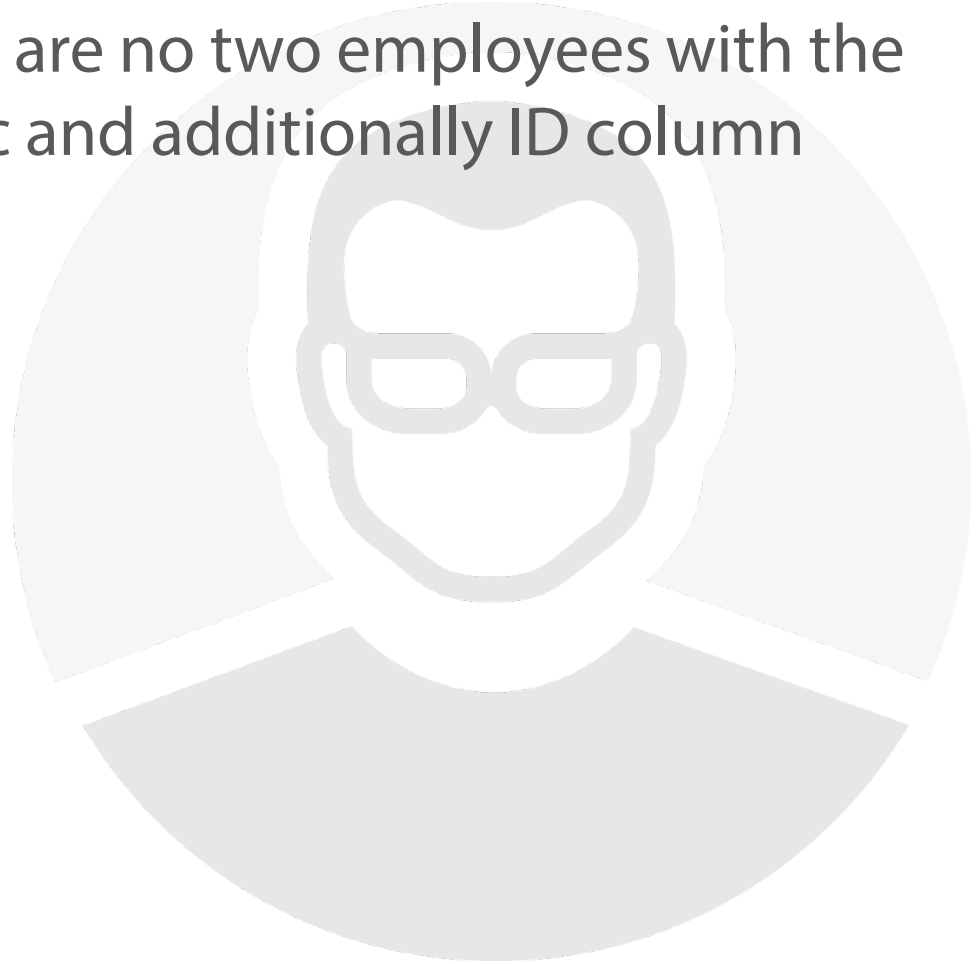
- Primary keys must contain UNIQUE values
- A primary key column cannot contain NULL values
- A table can have only one primary key

Technically, a primary key constraint is simply a combination of a unique constraint and a not-null constraint.

— Remember

Scenario 5: Primary Key Constraints

- Story: Beth asks Troy to make sure that there are no two employees with the same ID in the Employee Table of AlmondInc and additionally ID column should not allow Null values.
- Name of the table: Employee
  - ID (int)
  - Apply unique constraint on column ID
  - Apply Not-Null constraint on column ID
  - OR
  - Create Primary Key on Column ID



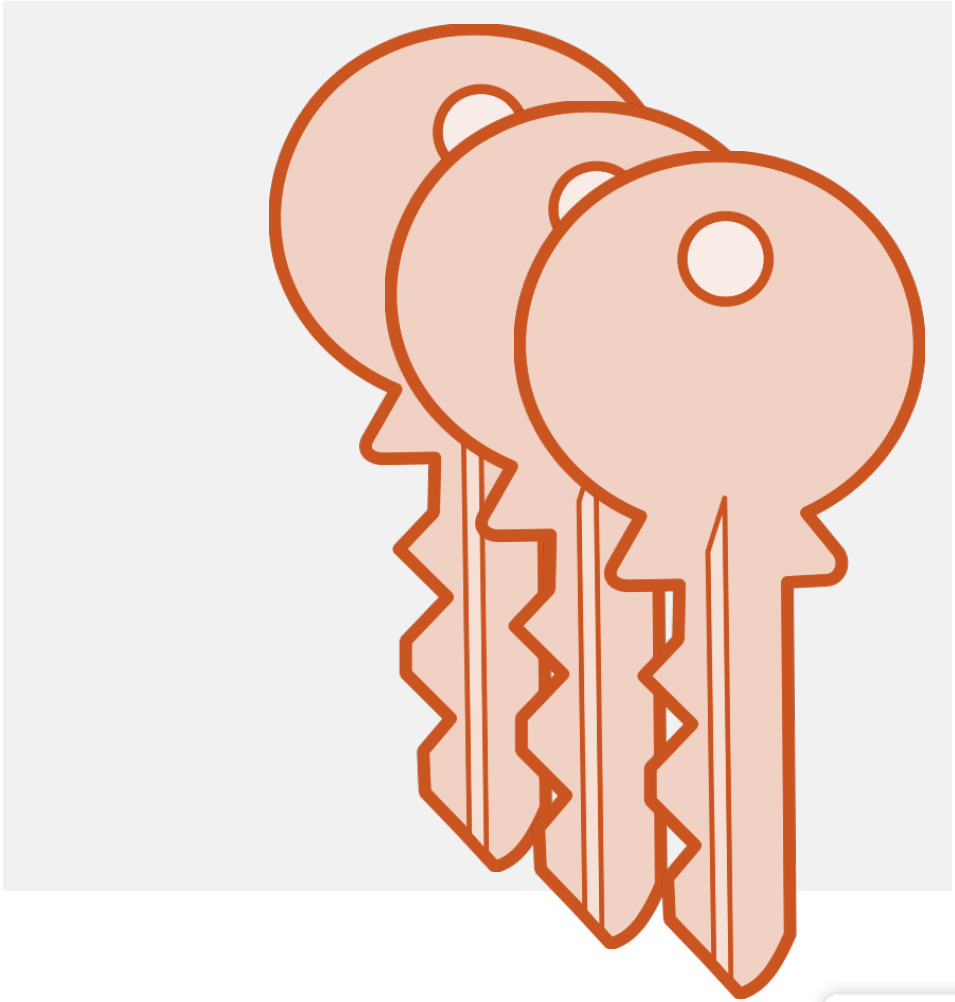
What is a Foreign Key?

A Foreign Key is a field in one table that uniquely identifies a row of another table.

Properties of Foreign Keys

- It is column or a combination of columns whose values match a Primary Key in a different table.

- A table can have multiple foreign keys.

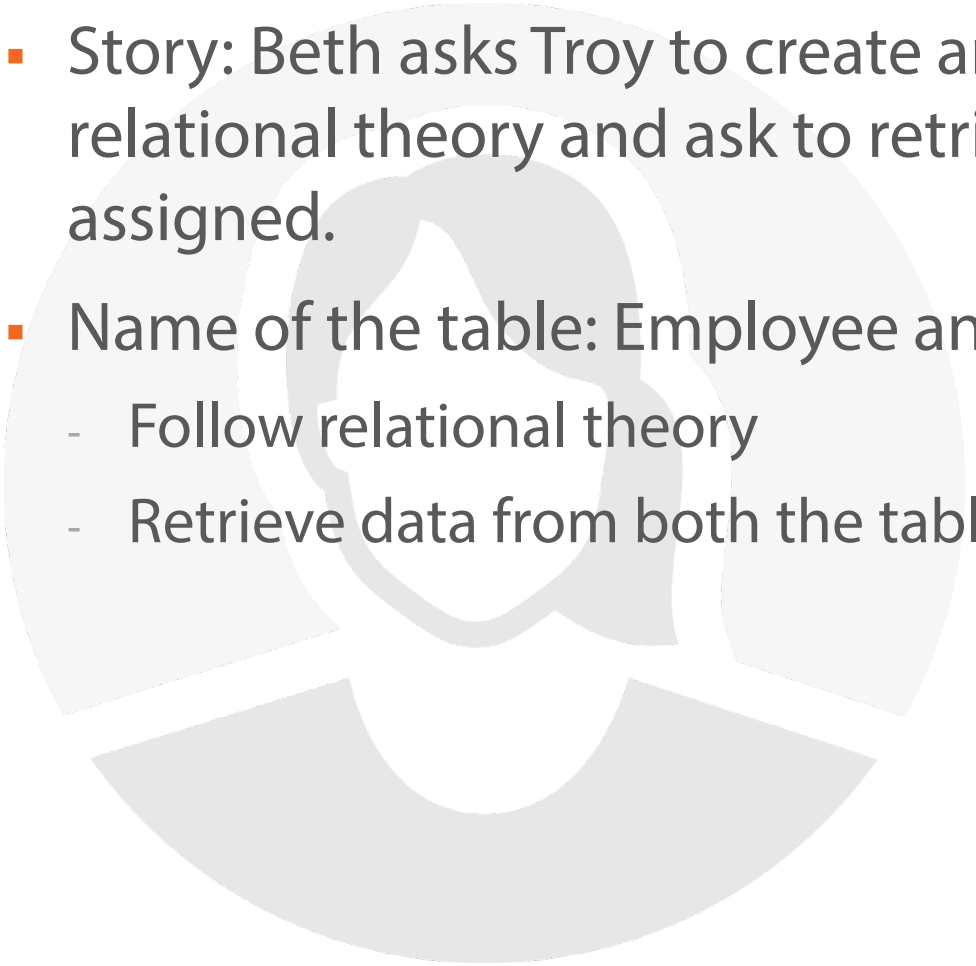


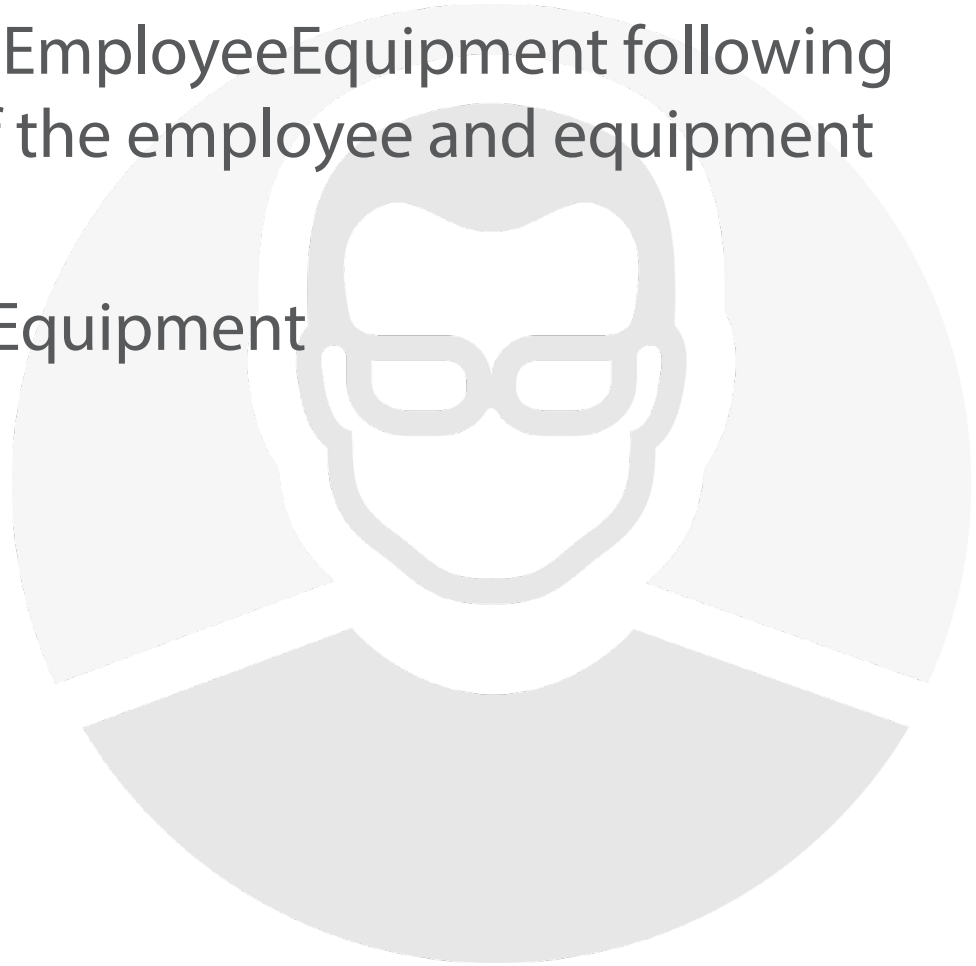
The table containing the foreign key is called the ***referencing*** or ***child table***, and the table containing the primary key is called the ***referenced*** or ***parent table***.

— Remember

Scenario 6: Foreign Key Constraints

- Story: Beth asks Troy to create another table EmployeeEquipment following relational theory and ask to retrieve name of the employee and equipment assigned.
- Name of the table: Employee and EmployeeEquipment
  - Follow relational theory
  - Retrieve data from both the tables





ID	Name
1	Spencer
2	Steve
3	Mark

Employee

ID	EmployeeID	Equipment
1	1	Desk Comp
2	2	Laptop
3	1	Laptop
4	3	Mobile

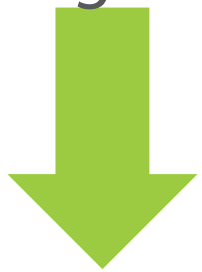
Employee Equipment

Primary Key

ID	Name
1	Spencer
2	Steve
3	Mark

Employee

Foreign Key



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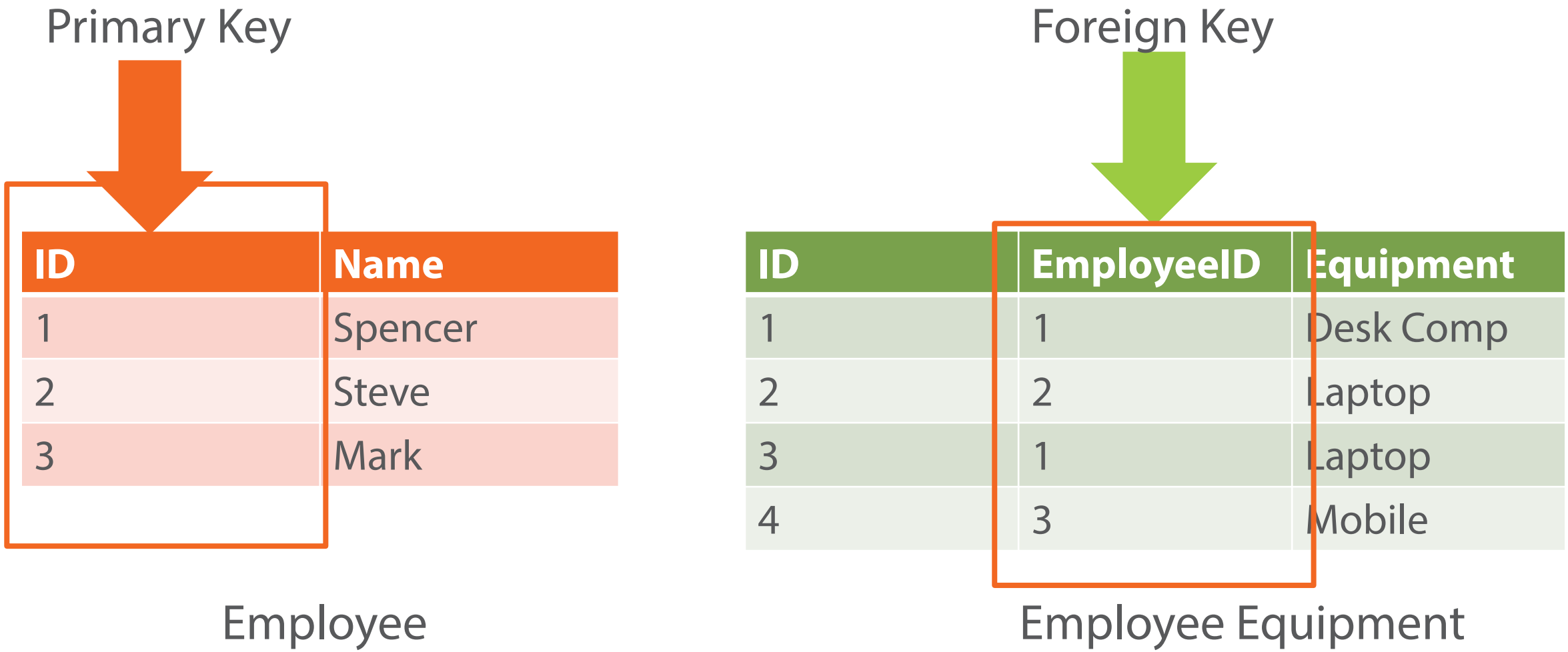
2	2	Laptop
3	1	Laptop
4	3	Mobile

Employee Equipment



Scenario Conclusion

Beth
Sr. DBA

Troy
Intern

Scenario Conclusion

Beth
Sr. DBA

Troy
Jr. DBA

Summary

- Schemas
- Constraints and Keys
  - Check Constraint
  - Not-Null Constraint
  - Unique Constraint
  - Keys - Primary and Foreign