

# Databases & SQL for Data Science with Python

PROFESSIONAL CERTIFICATE IBM Data Analyst

# In this week!

- Explain how the entity name and attributes map to a relational database table in ER data model
- Identify some commonly used data types
- Identify relationships between tables
- Describe the function of primary keys & foreign Keys
- List some relational databases on the cloud?
- Identify SQL Commands Alter, Drop, Truncate



# Entity relationship (ER) data model

Suppose we design Npower Canada's database. In this database, the participants will be an entity with attributes like id, name, age, etc.



<i>Participant</i>	
<i>Name</i>	<code>varchar(20)</code>
<i>Age</i>	<code>Float(20)</code>
<i>ID</i>	<code>int(255)</code>

# Identify some commonly used data types

Find more here

[https://www.w3schools.com/sql/sql\\_datatypes.asp](https://www.w3schools.com/sql/sql_datatypes.asp)



# Relationships between tables

## one-to-one

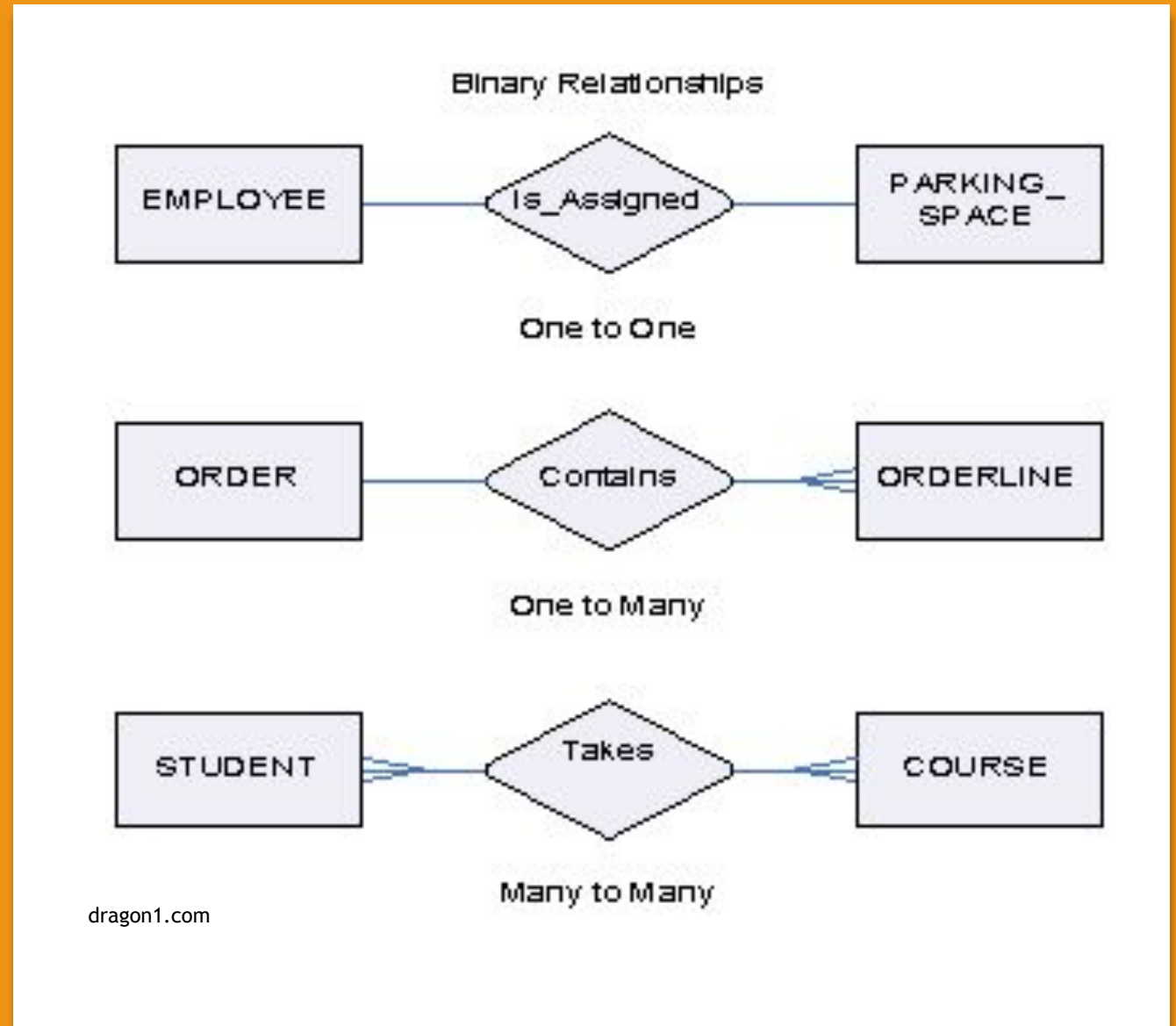
- Each Employee is assigned to a one parking space, and each parking space is assigned to one employee

## one-to-many

- Each order contains multiple ordelline, and each ordelline is contained under one order

## many-to-many

- Each student can have multiple courses, and each course have many students



# Exercise

Read the relationships!

- one-to-one
- one-to-many
- many-to-many

one-to-one



one to many



many-to-many

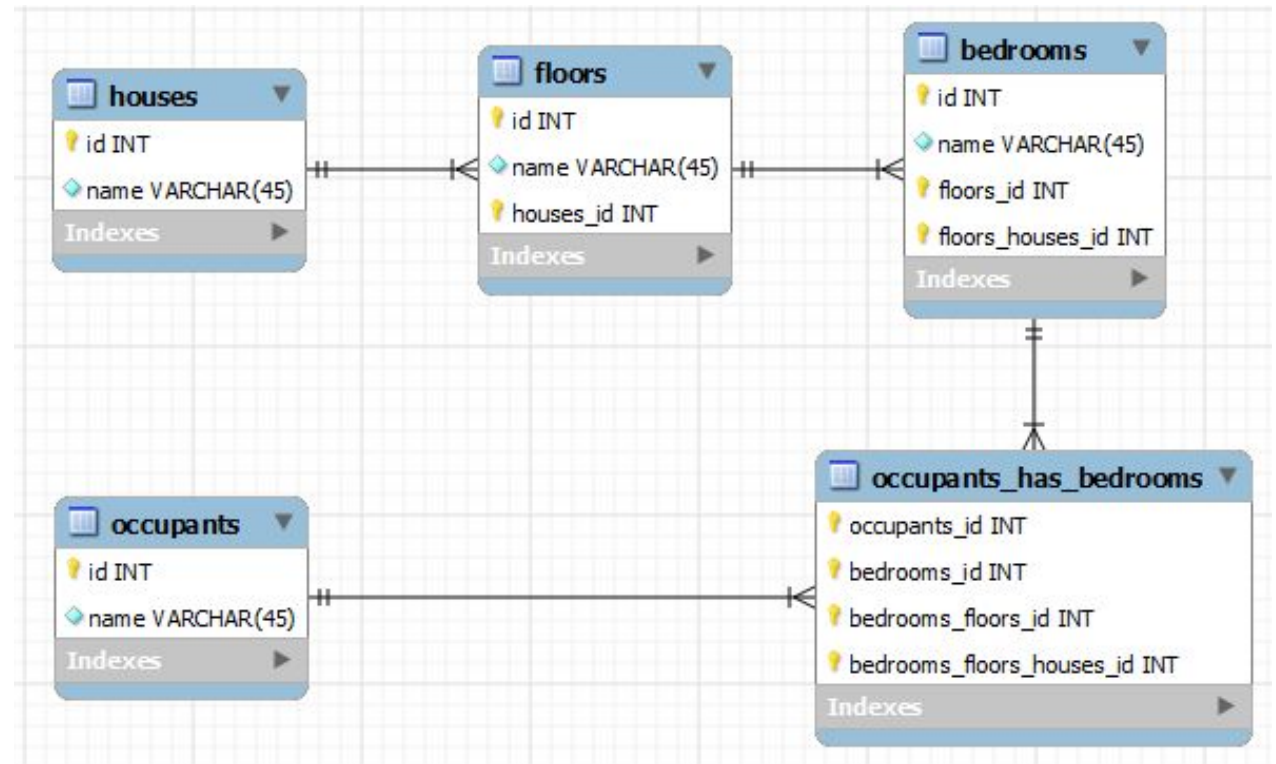




# Exercise

Read the relationships!

- one-to-one
- one-to-many
- many-to-many



stackoverflow.com

# Activity: Entity relationship Model

- Take 30 minutes, download the “Entity relationship model activity from Schoology.
- Review the database scenarios, build the ER models and convert it into tables.
- What are the relationships between the tables?



# Primary Key

- Uniquely identify a record in the table.
- In the retail store example what should be the primary key for each table?

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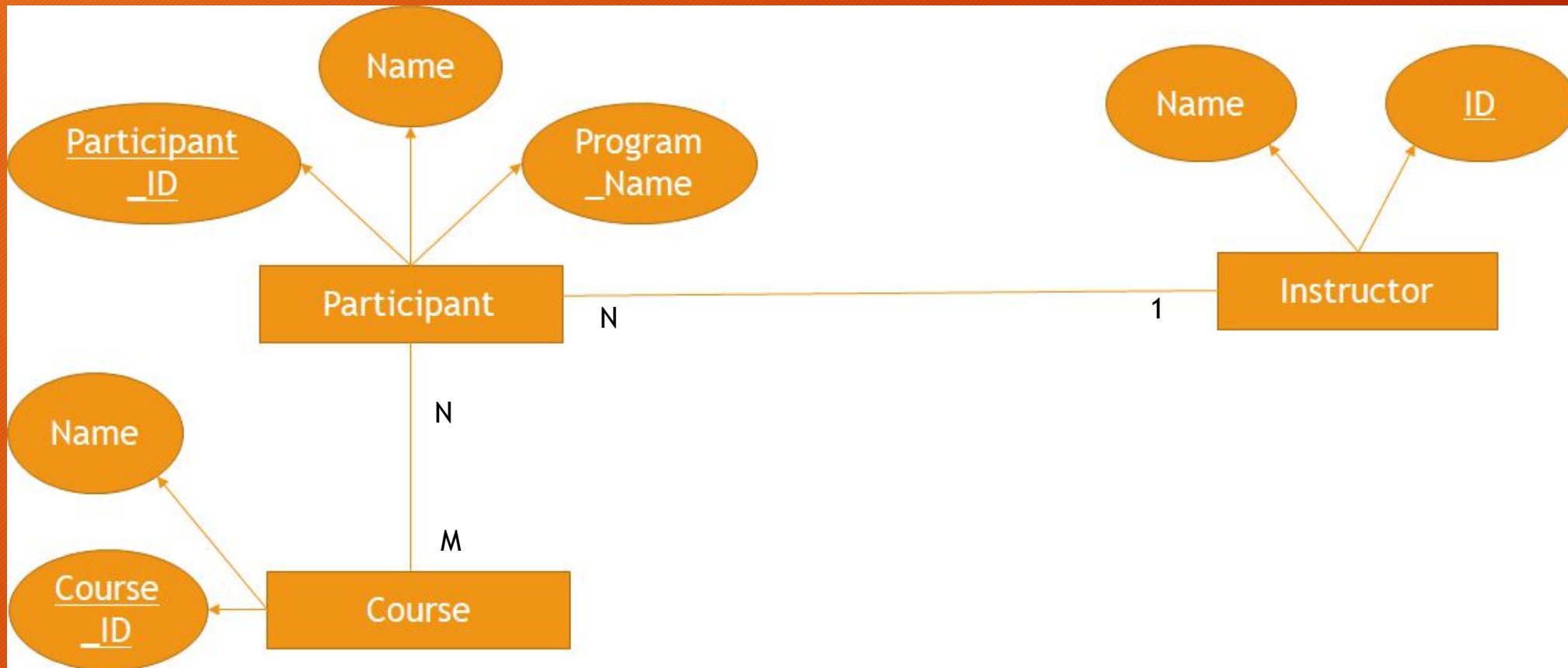




# Primary Key

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- In the Npower example what should be the primary key for each table?

# Primary Key





# Foreign keys

- Tables can also contain foreign keys which are primary keys defined in other tables, creating a link between the tables.

# Databases on the cloud

What are the advantages of using DB on cloud?



# Databases on the cloud

What are the advantages of using DB on cloud?

- Ease of use and access
- Scalability & Economics
- Disaster recovery



# Relational databases on Cloud

- List some relational databases on the cloud?



# Relational databases on Cloud

- IBM Db2 on Cloud
- Databases for PostgreSQL on IBM Cloud
- Oracle Database Cloud Service
- Microsoft Azure SQL Database
- Amazon Relational Database Services



# Alter



Add or remove  
columns from a  
table,



Modify the data  
type of columns



Add or remove  
keys



Add or remove  
constraints

- ALTER TABLE table\_name  
ADD column\_name datatype;
- ALTER TABLE table\_name  
ALTER COLUMN column\_name  
datatype;



# Drop

- ALTER TABLE *table\_name*  
DROP COLUMN *column\_name*;
- DROP TABLE *table\_name*;

# Exercise

- Write SQL statement that adds an "Email" column to the "Customers" table



# Exercise

- Write SQL statement that adds an "Email" column to the "Customers" table
- ALTER TABLE Customers  
ADD Email varchar(255);



# Exercise

What is the result of the following statement `DROP TABLE Book;`

- A. Delete the entire Book table
- B. Delete the data inside the Book table
- C. Delete the Book column in the Library table



# Truncate

- Delete the data in a table rather than deleting the table itself
- `TRUNCATE TABLE table_name IMMEDIATE;`



# Exercise

What is the result of the following statement `Truncate TABLE Book IMMEDIATE;`

- A. Delete the entire Book table
- B. Delete the data inside the Book table
- C. Delete the Book column in the Library table



# Hands-on Labs

- Take 60 min to complete the hands-on Labs On Coursera:
- CREATE, ALTER, TRUNCATE, DROP
- Create and Load Tables using SQL Scripts



# Summary: Group Discussion Activity

- Download week 2 summary review questions from Schoology.
- Discuss your answers in the main group





Any questions