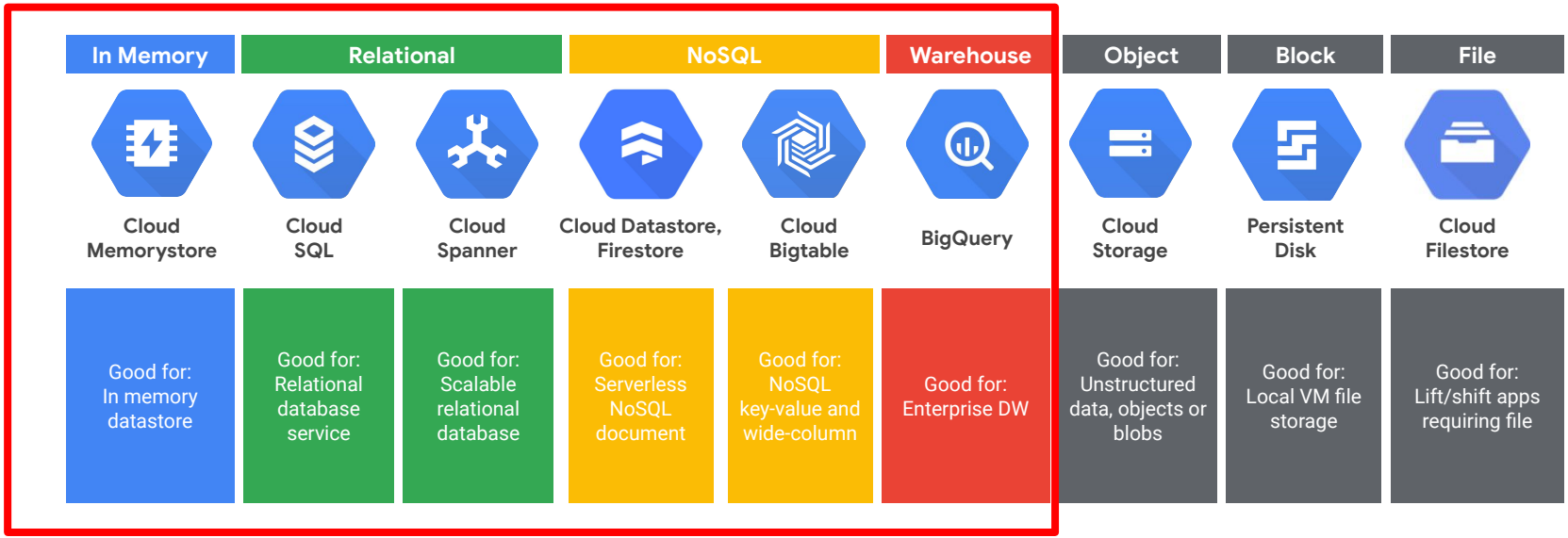
Google

# Cloud Computing #6

# Cloud Database Services

# Which storage type?




Google Cloud

# Database ( SQL )

# Cloud SQL

Managed MySQL,Postgresql and Microsoft SQL

- Automatic replication
- Automatic backups
- Scaling
- Google security

# Cloud SQL can be used with other GCP services

Cloud SQL can be used with App Engine using standard drivers.

You can configure a Cloud SQL instance to follow an App Engine application.

Compute Engine instances can be authorized to access Cloud SQL instances using an external IP address.

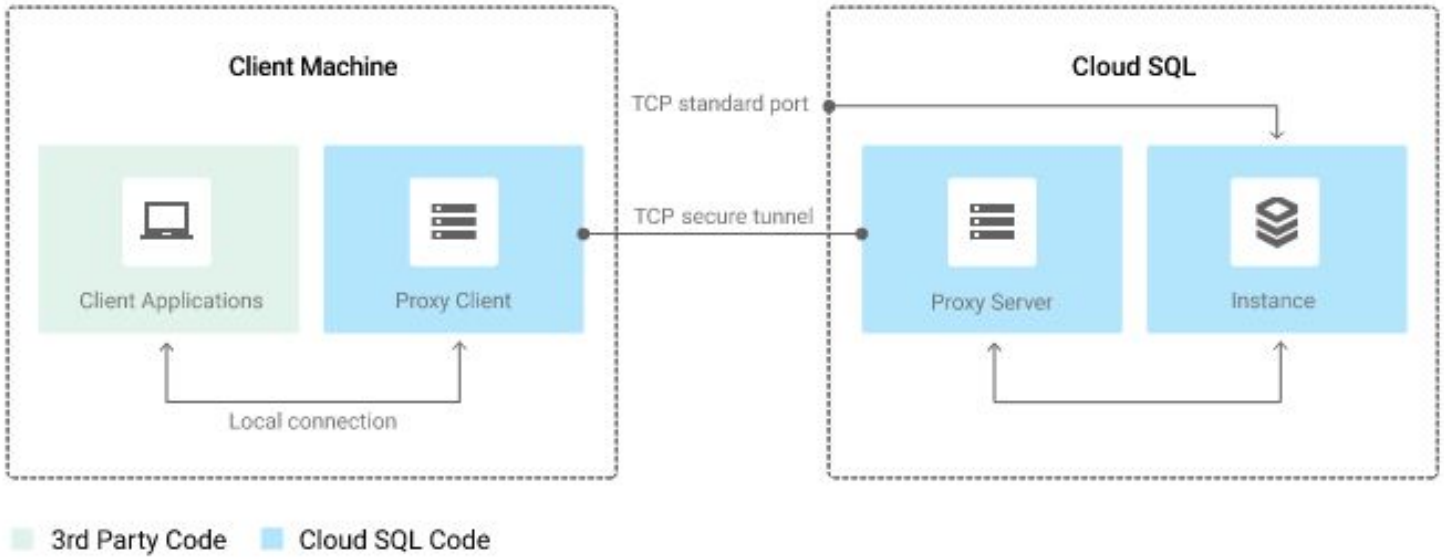
Cloud SQL instances can be configured with a preferred zone.


Cloud SQL can be used with external applications and clients.

Standard tools can be used to administer databases.

External read replicas can be configured.

# Cloud SQL Proxy



Lab

# Cloud SQL for MySQL: Qwik Start

30 minutes 1 Credit

GSP151

Google Cloud Self-Paced Labs

# Introduction to SQL for BigQuery and Cloud SQL

SQL (Structured Query Language) is a standard language for data operations that allows you to ask questions and get insights from structured datasets. It's commonly used in database management and allows you to perform tasks like transaction record writing into relational databases and petabyte-scale data analysis.

# Basics of SQL

| User | Price | Shipped |
| --- | --- | --- |
| Sean | $35 | Yes |
| Rocky | $50 | No |

A Database is essentially a *collection of one or more tables*. SQL is a structured database management tool, but quite often (and in this lab) you will be running queries on one or a few tables joined together—not on whole databases.

# SELECT and FROM

example_table

| | A | B | C |
|---|---|---|---|
| 1 | USER | PRICE | SHIPPED |
| 2 | SEAN | $35 | YES |
| 3 | ROCKY | $50 | NO |
| 4 | AMANDA | $20 | YES |
| 5 | EMMA | $65 | YES |
| 6 | ANDRES | $10 | NO |
| 7 | CASEY | $55 | YES |
| 8 | HANNAH | $15 | NO |
| 9 | JOCELYN | $30 | NO |

```
SELECT USER FROM example_table
```

# SELECT multiple columns

| | A | B | C |
|---|---|---|---|
| 1 | USER | PRICE | SHIPPED |
| 2 | SEAN | $35 | YES |
| 3 | ROCKY | $50 | NO |
| 4 | AMANDA | $20 | YES |
| 5 | EMMA | $65 | YES |
| 6 | ANDRES | $10 | NO |
| 7 | CASEY | $55 | YES |
| 8 | HANNAH | $15 | NO |
| 9 | JOCELYN | $30 | NO |

```
SELECT USER, SHIPPED FROM example_table
```

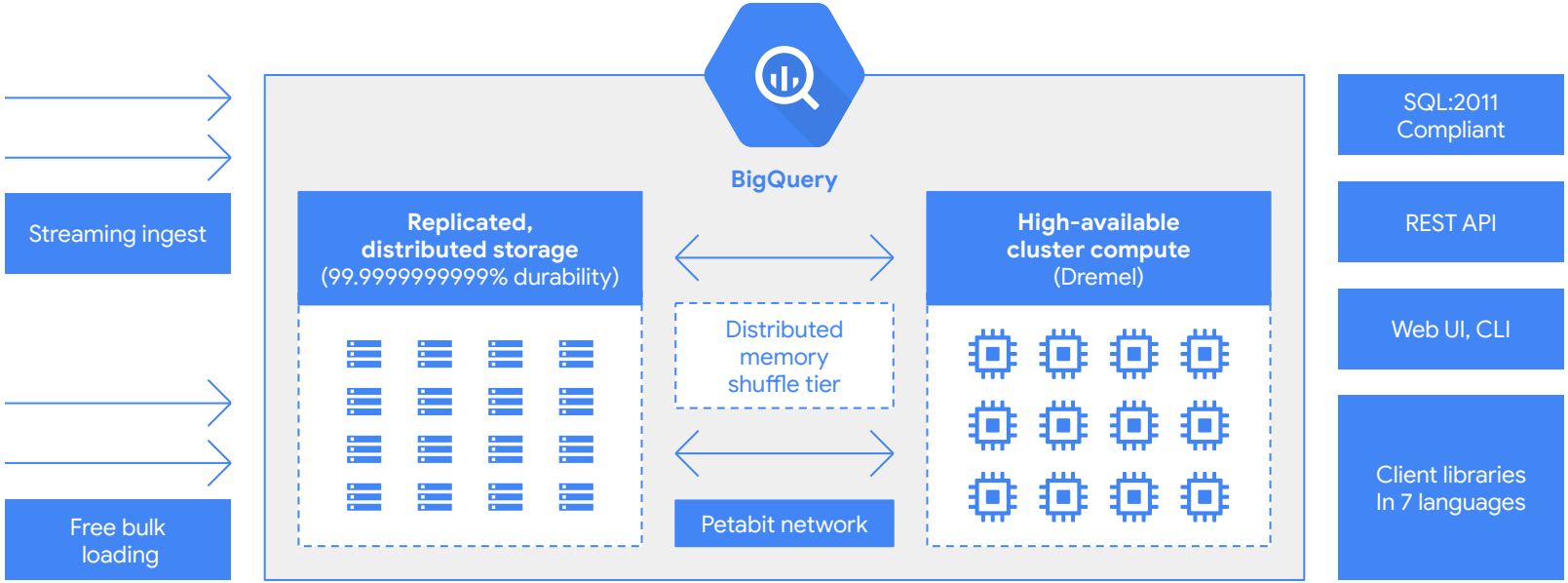
# WHERE

| | A | B | C |
|---|---|---|---|
| 1 | USER | PRICE | SHIPPED |
| 2 | SEAN | $35 | YES |
| 3 | ROCKY | $50 | NO |
| 4 | AMANDA | $20 | YES |
| 5 | EMMA | $65 | YES |
| 6 | ANDRES | $10 | NO |
| 7 | CASEY | $55 | YES |
| 8 | HANNAH | $15 | NO |
| 9 | JOCELYN | $30 | NO |

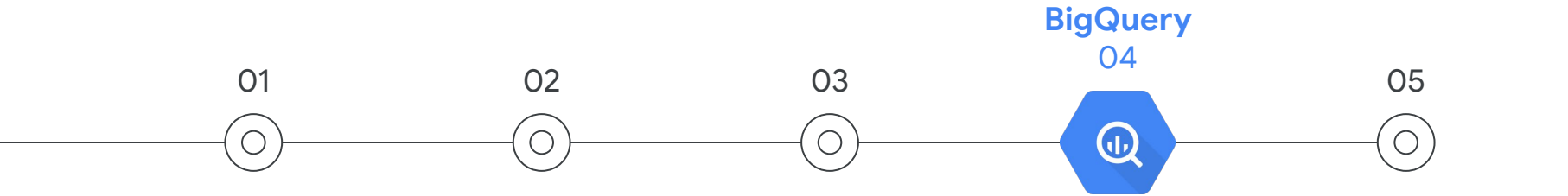
```
SELECT USER FROM example_table WHERE SHIPPED='YES'
```

# BigQuery: architecture

Serverless. Decoupled storage and compute for maximum flexibility.

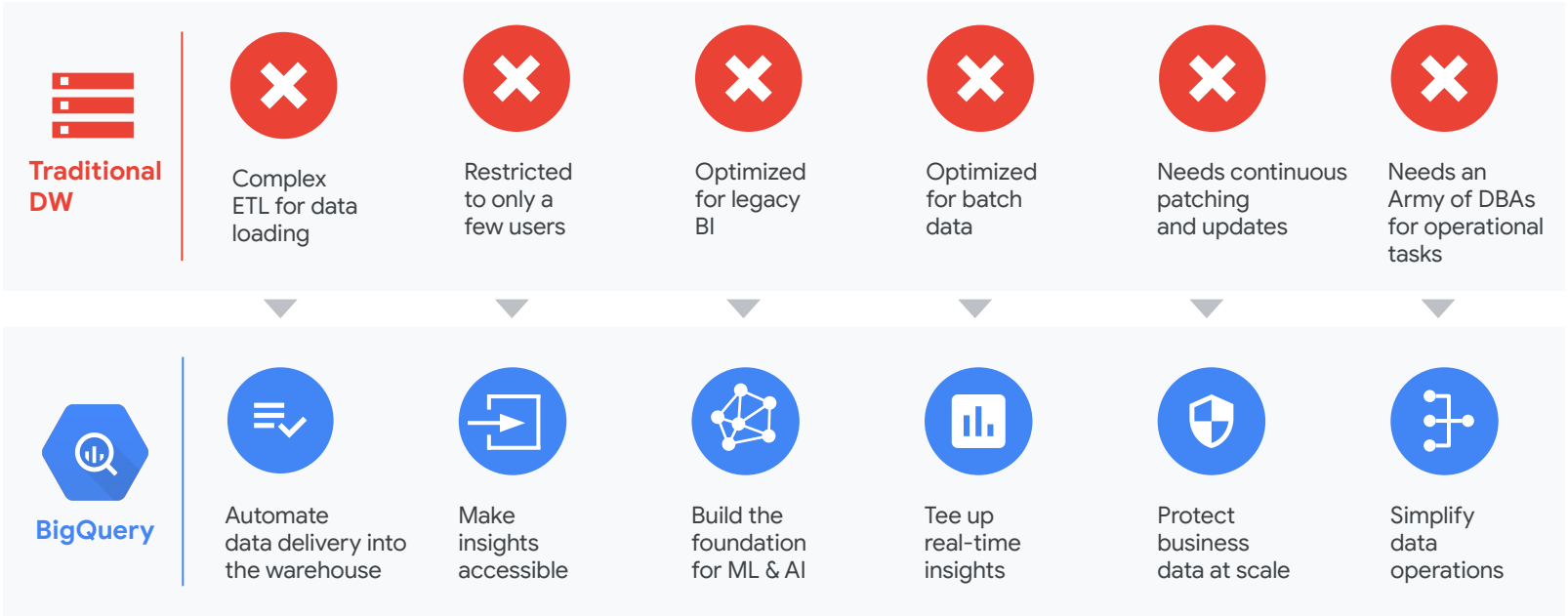


# A modern data warehouse part of Google Cloud's comprehensive analytics platform




**BigQuery is natively integrated across the analytics chain.**

# BigQuery overcomes traditional data warehouse limitations



Lab

# Introduction to SQL for BigQuery and Cloud SQL

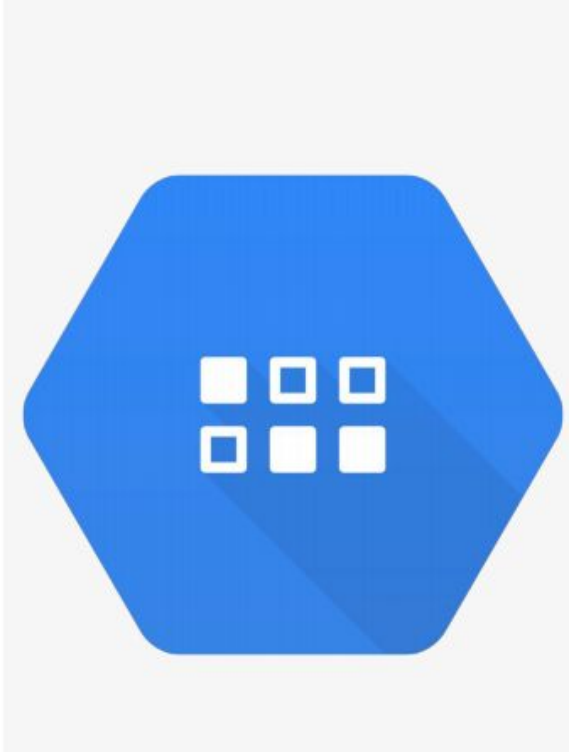
1 hour 15 minutes  1 Credit  

GSP281

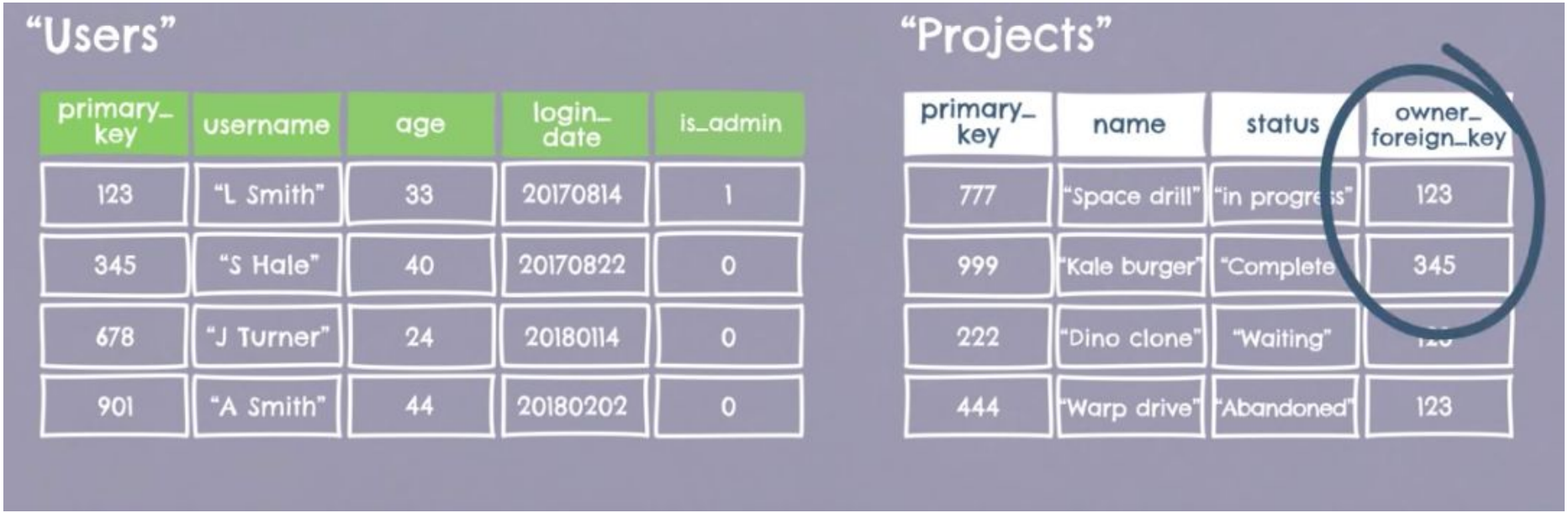
# Database ( NoSQL )

# Firestore

- Schemaless access
  - No need to think about underlying data structure
- Local development tools
- Includes a free daily quota
- Access from anywhere through a RESTful interface

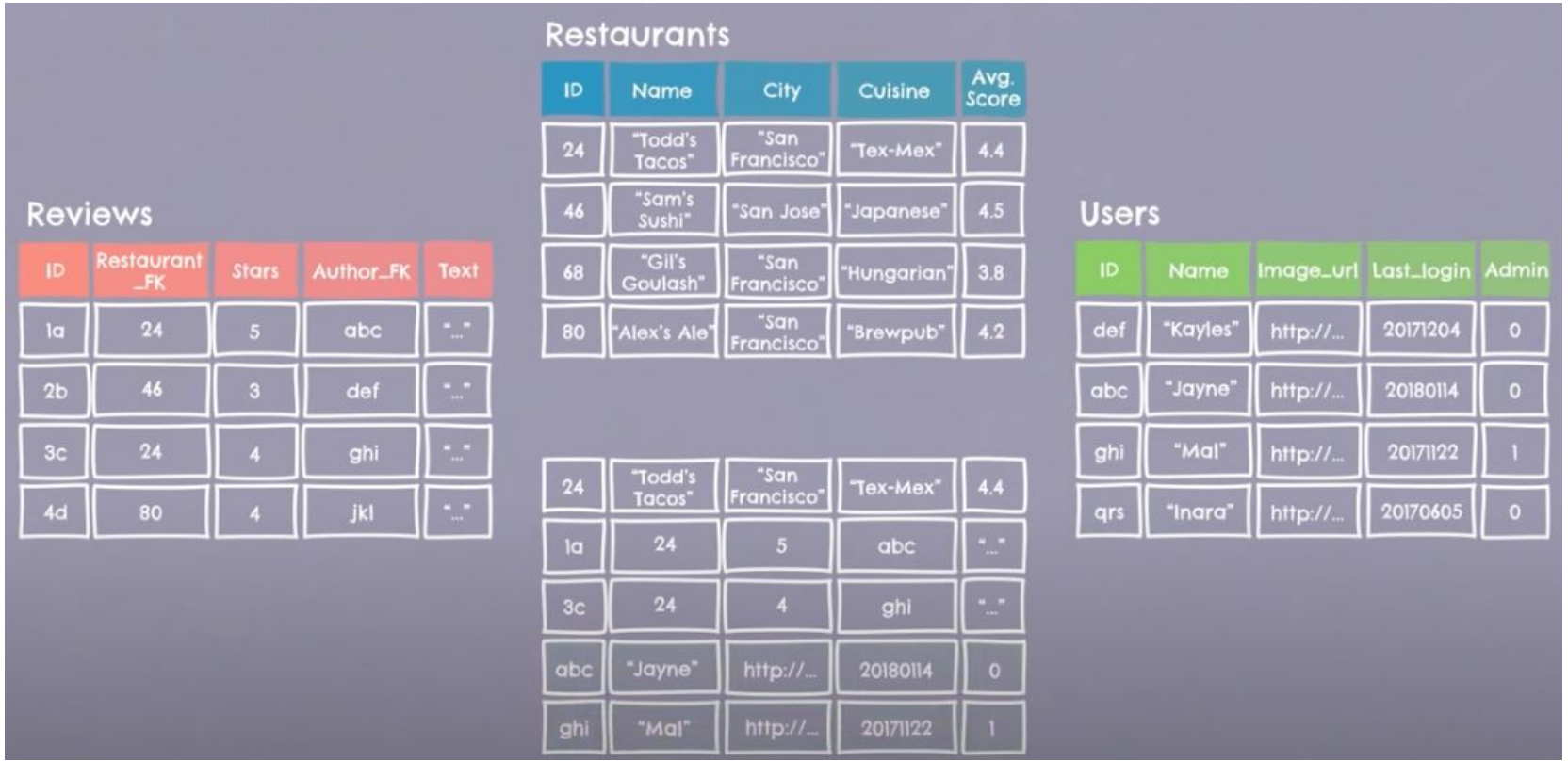


# SQL table

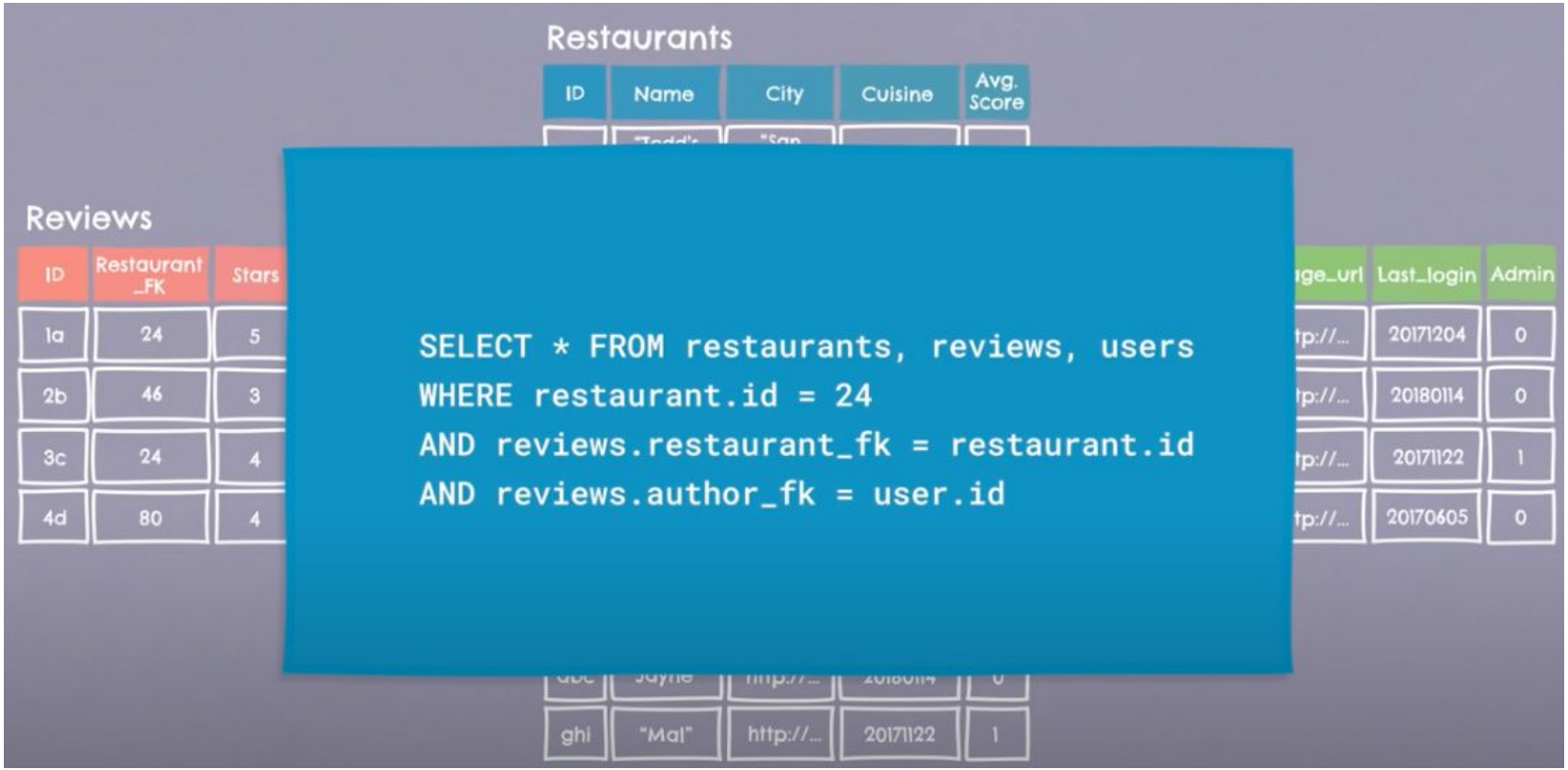

"Users"
primary_key
username
age
login_date
is_admin
123
"L Smith"
33
20170814
1
345
"S Hale"
40
20170822
0
678
"J Turner"
24
20180114
0
901
"A Smith"
44
20180202
0
"Projects"
primary_key
name
status
owner_foreign_key
777
"Space drill"
"in progress"
123
999
"Kale burger"
"Complete
345
222
"Dino clone"
"Waiting"
444
"Warp drive"
"Abandoned"
123

# Table Design for SQL database

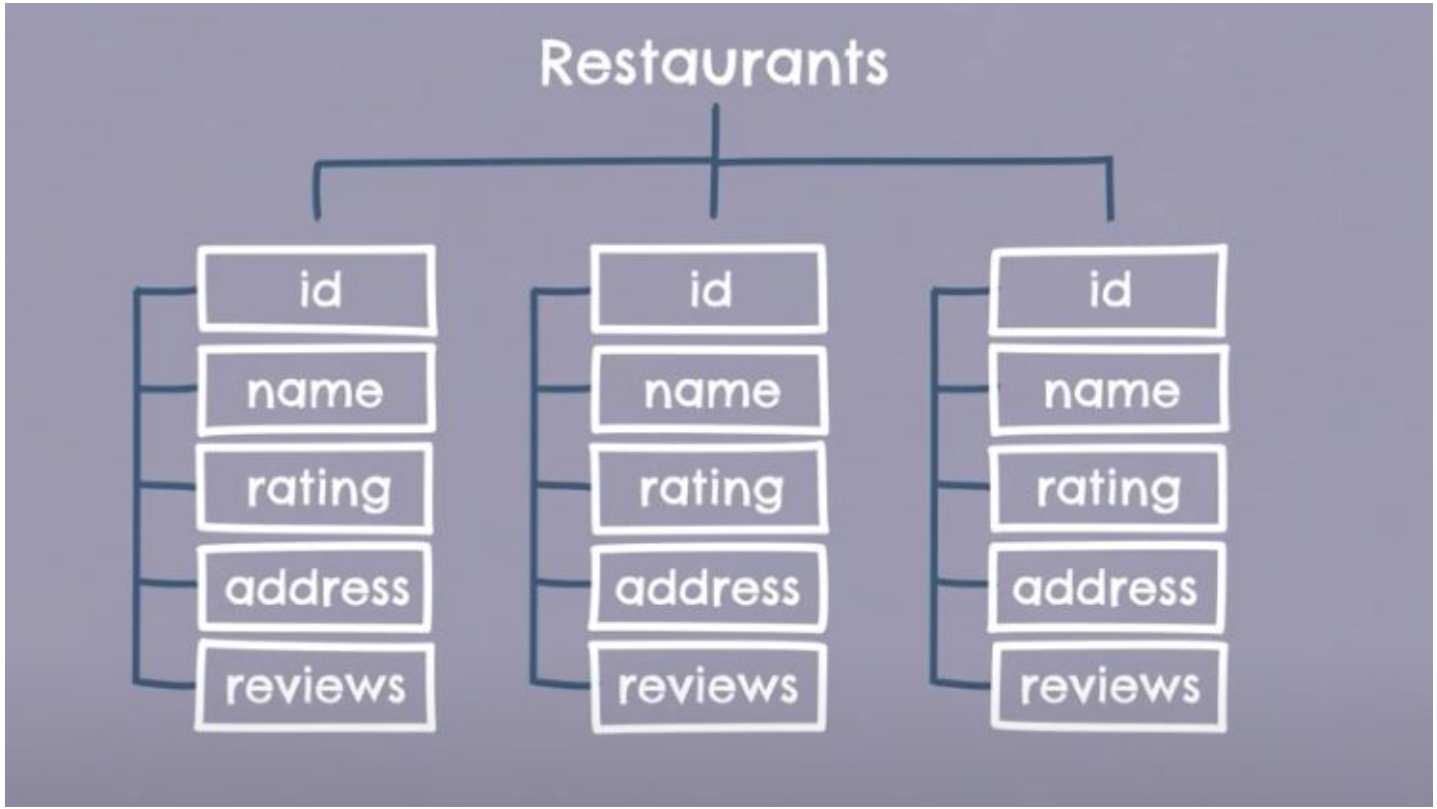
# Join Table


Restaurants
ID
Name
City
Cuisine
Avg. Score
24
"Todd's Tacos"
"San Francisco"
"Tex-Mex"
4.4
46
"Sam's Sushi"
"San Jose"
"Japanese"
4.5
68
"Gil's Goulash"
"San Francisco"
"Hungarian"
3.8
80
"Alex's Ale"
"San Francisco"
"Brewpub"
4.2
Reviews
ID
Restaurant_FK
Stars
Author_FK
Text
1a
24
5
abc
"..."
2b
46
3
def
"..."
3c
24
4
ghi
"..."
4d
80
4
jkl
"..."
Users
ID
Name
Image_url
Last_login
Admin
def
"Kayles"
http://...
20171204
0
abc
"Jayne"
http://...
20180114
0
ghi
"Mal"
http://...
20171122
1
qrs
"Inara"
http://...
20170605
0
24
"Todd's Tacos"
"San Francisco"
"Tex-Mex"
4.4
1a
24
5
abc
"..."
3c
24
4
ghi
"..."
abc
"Jayne"
http://...
20180114
0
ghi
"Mal"
http://...
20171122
1

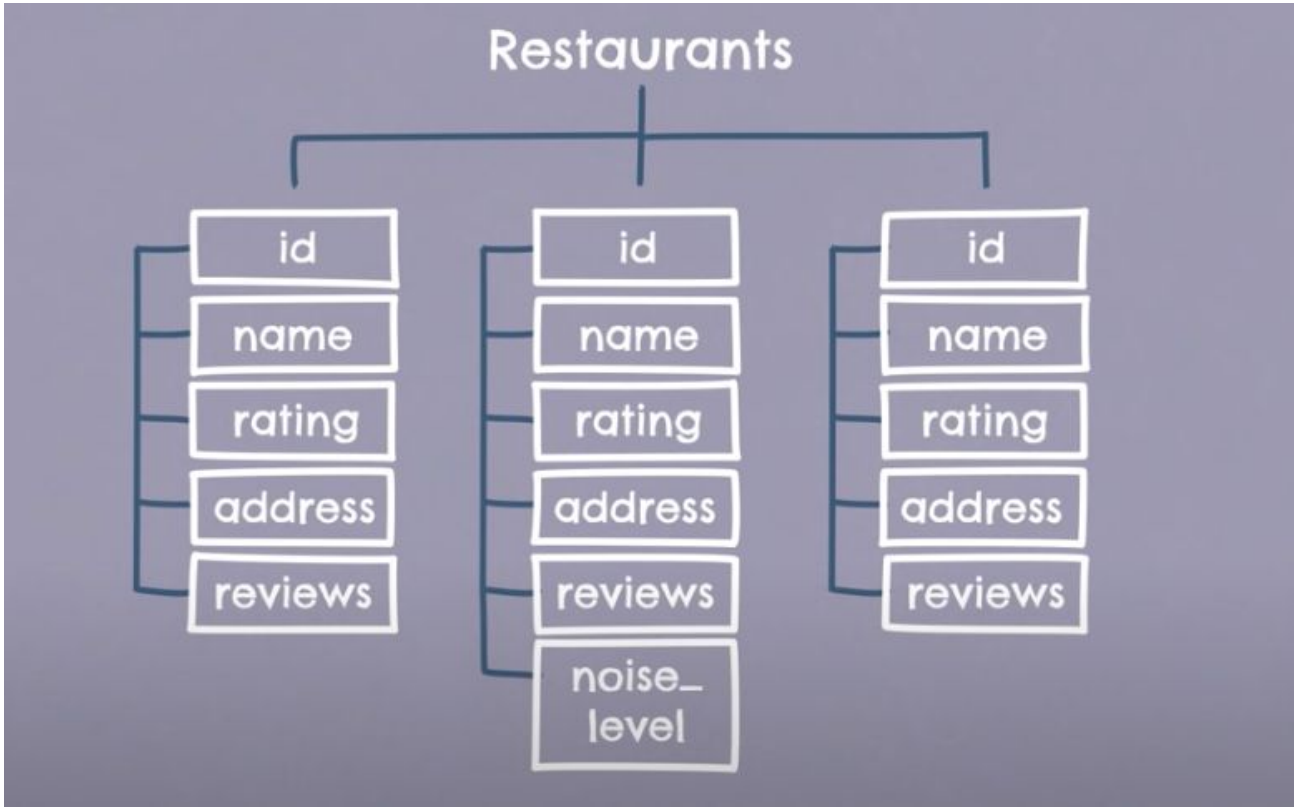
# SQL Command


Restaurants
ID
Name
City
Cuisine
Avg. Score
Reviews
ID
Restaurant _FK
Stars
1a
24
5
2b
46
3
3c
24
4
4d
80
4
Last_login
Admin
20171204
0
20180114
0
20171122
1
20170605
0
SELECT * FROM restaurants, reviews, users
WHERE restaurant.id = 24
AND reviews.restaurant_fk = restaurant.id
AND reviews.author_fk = user.id
ghi
"Mal"
http://...
20171122
1

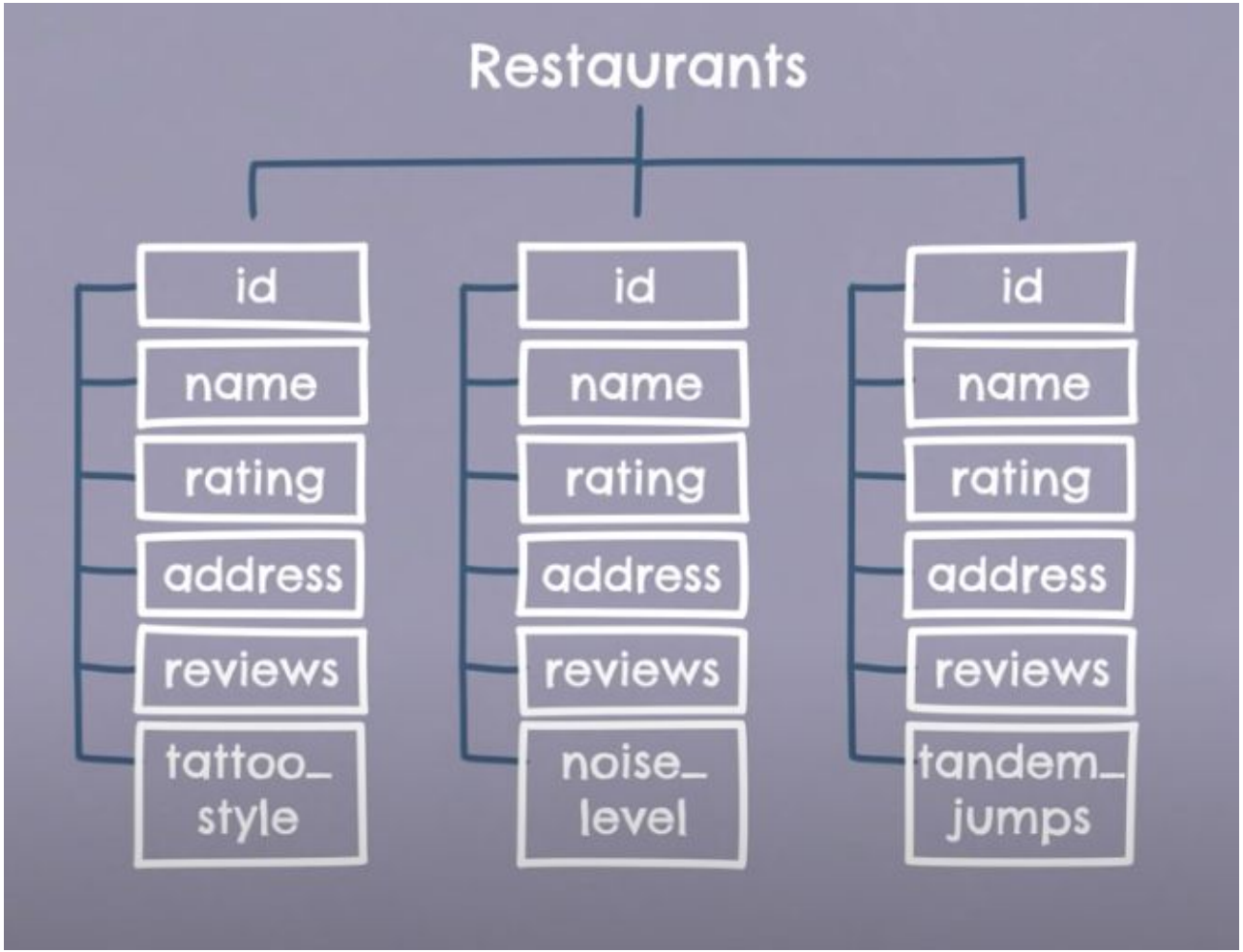
# Document Data Model



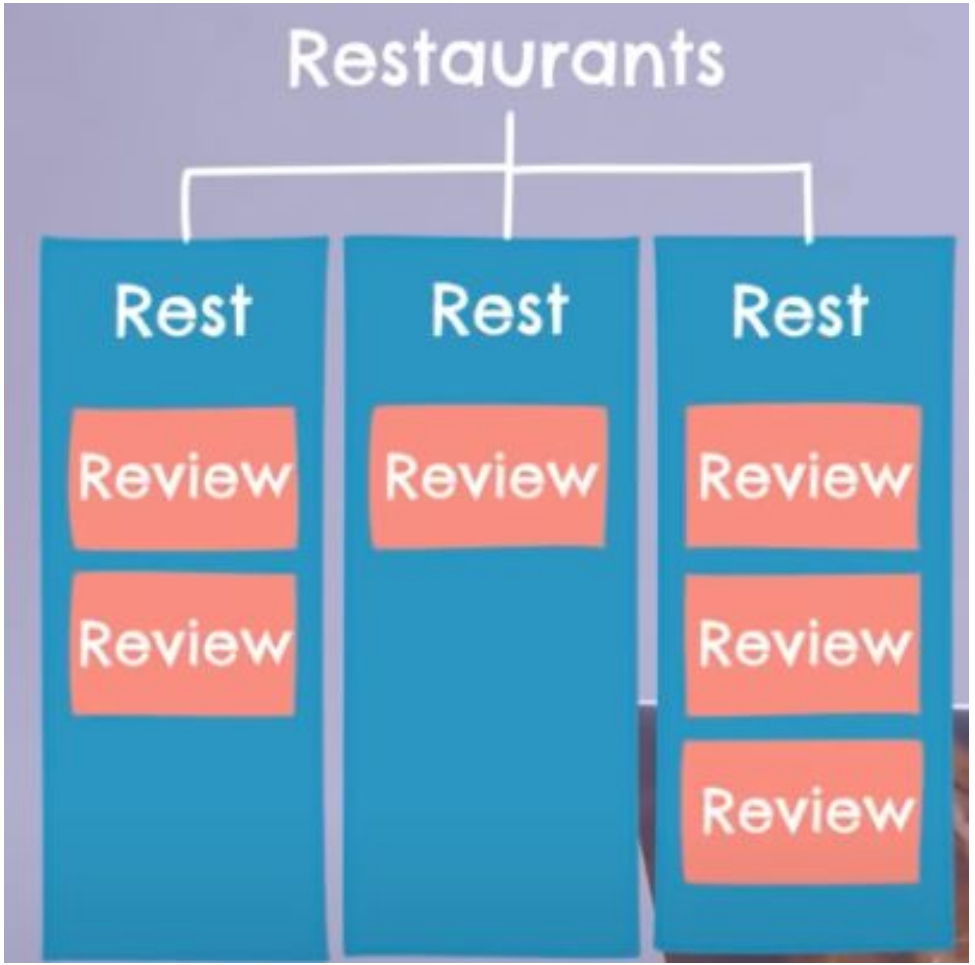
# Add new field



# Difference Type

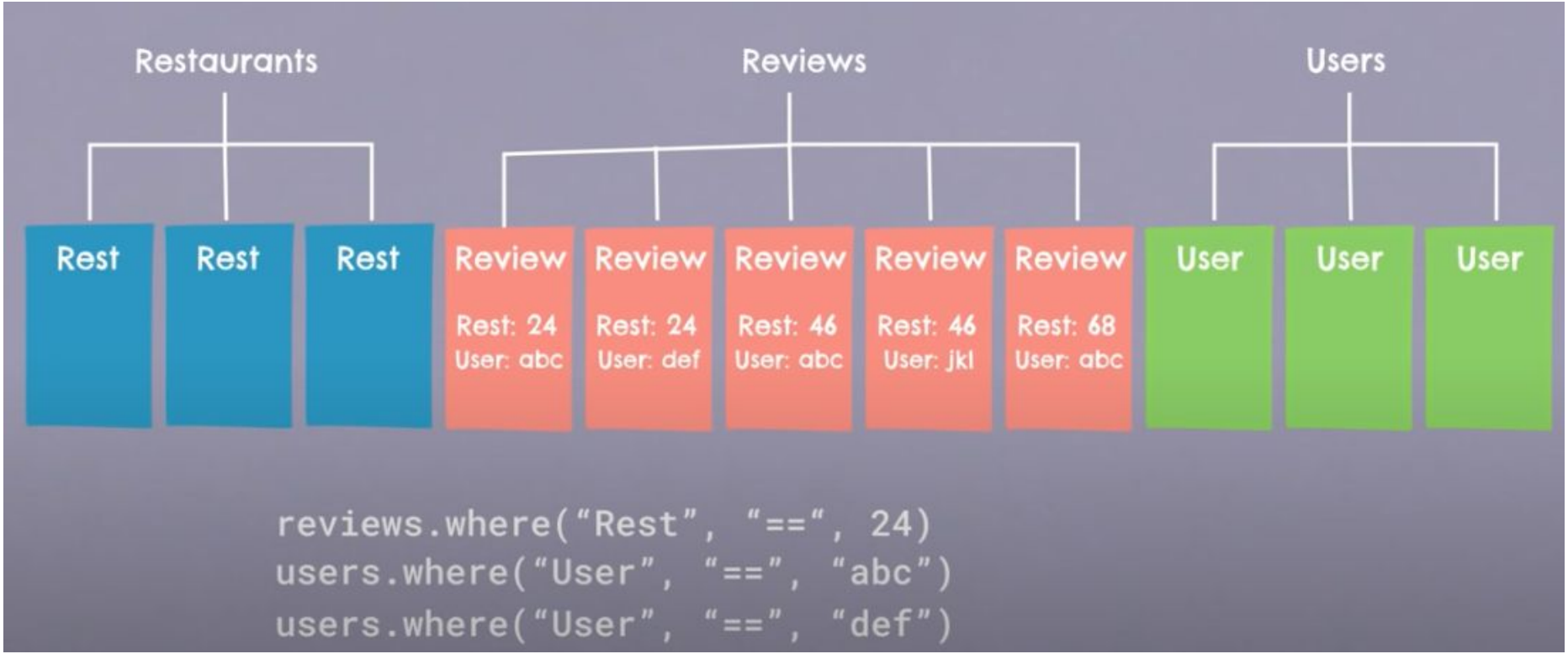


# Design Document
# Separate object

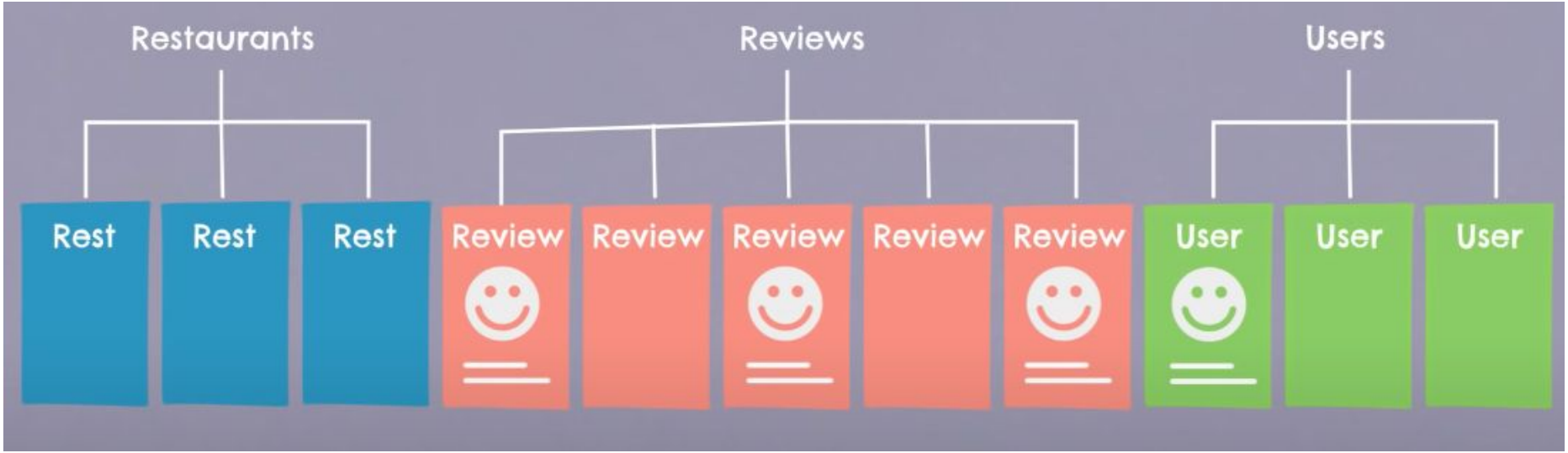


# Get Review by Restaurant

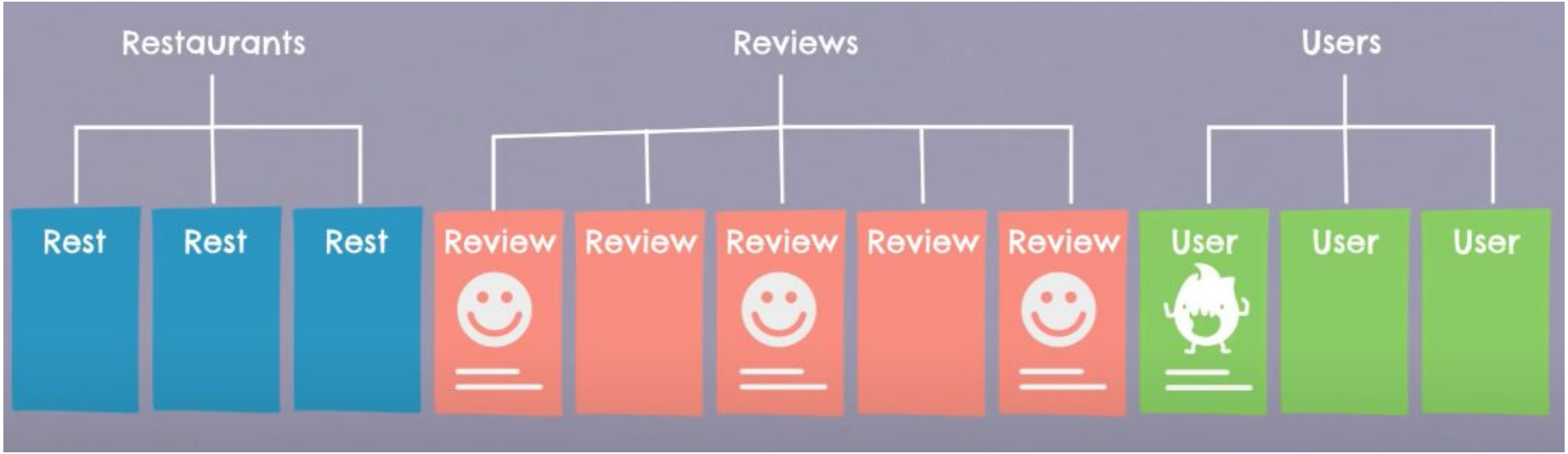
# Filter with key



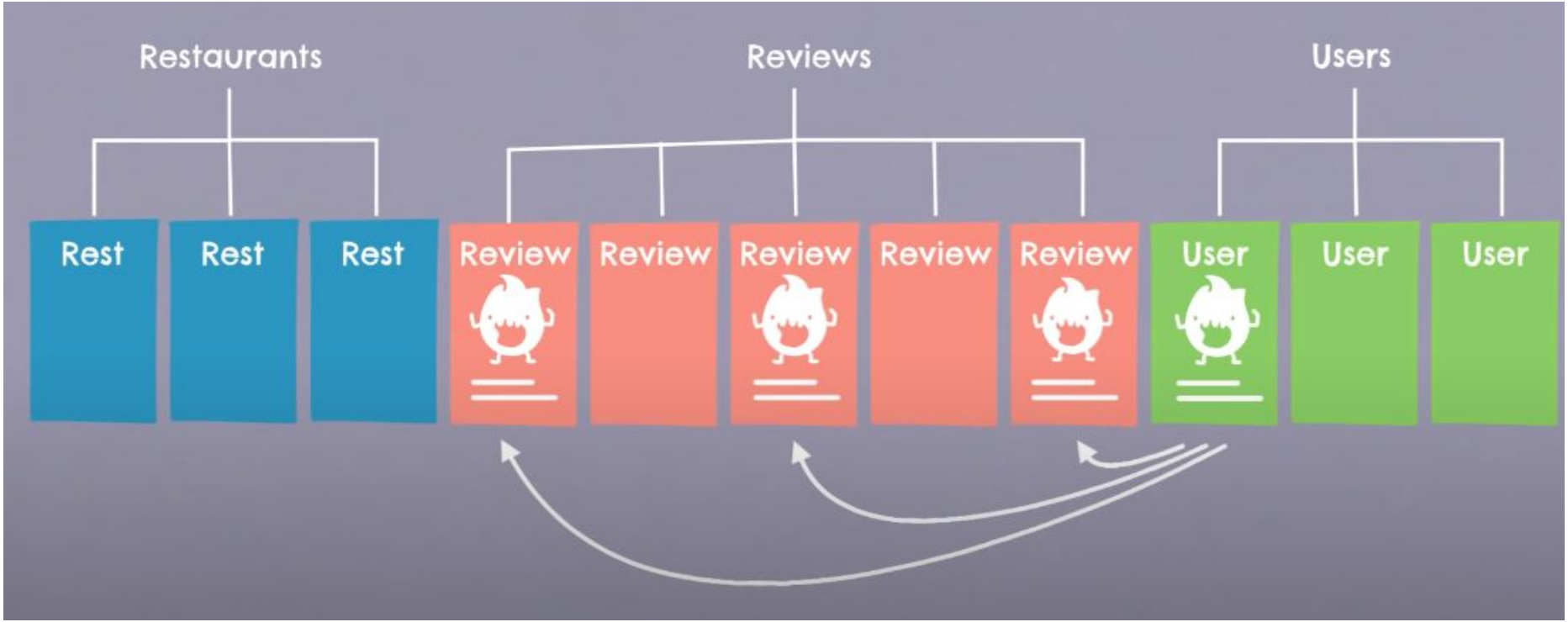
# Inconsistency Problem



# Update Profile Picture



# Should Replace to everywhere



Consider

# Read Review or Change Profile Picture

# Data Model : Document

In Cloud Firestore, the unit of storage is the document. A document is a lightweight record that contains fields, which map to values. Each document is identified by a name.


Complex, nested objects in a document are called maps. For example, you could structure the user's name from the example above with a map, like this:

# Data Model : Collection

Documents live in collections, which are simply containers for documents. For example, you could have a `users` collection to contain your various users, each represented by a document:

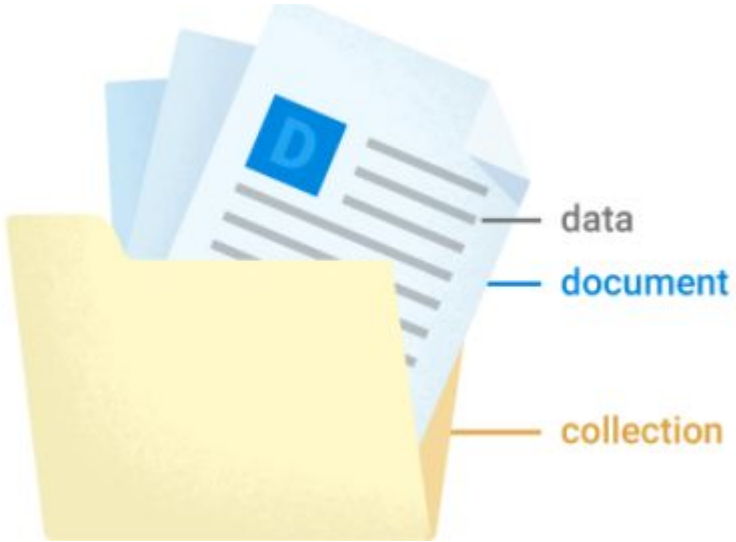
users

alovelace

```
first : "Ada"
last : "Lovelace"
born : 1815
```

aturing

```
first : "Alan"
last : "Turing"
born : 1912
```



Lab

# Importing Data to a Firestore Database

45 minutes 5 Credits ★★★★☆

GSP642

Google Cloud Self-Paced Labs

# Homework 1

## HTTP Load Balancer with Cloud Armor

1 hour  5 Credits  Rate Lab

**GSP215**

Google Cloud Self-Paced Labs

# Homework 2

## User Authentication: Identity-Aware Proxy

1 hour 5 Credits

GSP499

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5 Mar หยุด
12 Mar สอบ
19 Mar developer
26 Mar CI/CD devops
2 Apr Data engineer
9 Apr ML
16 Apr หยุด
23 Apr Bigdata
30 Apr ทบทวน