

DATA BASES MODELS AND MER

DataBase Foundations

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1 Databases Types

2 Entity-Relation Model (MER)



Outline

1 Databases Types

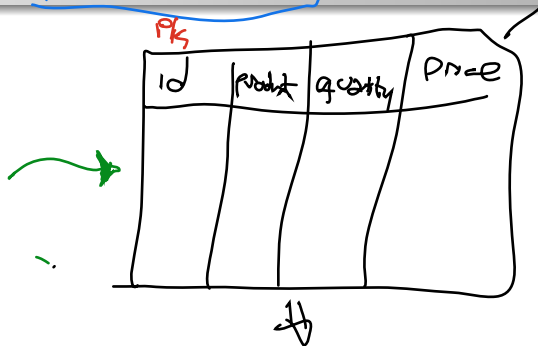
2 Entity-Relation Model (MER)



Relational DataBases I — Structured Data

product ~~~~~
 ~~~~~  
 ~~~~~  
 ~~~~~  
 ~~~~~

quantity ~~~~~
 ~~~~~  
 ~~~~~  
 ~~~~~  
 ~~~~~



Relational DataBases II — Tables & Keys

students

PK

name	email	career
Aria	a@odm..	1
Bob	b@odm..	3
Charlie	c@odm..	1
Dennis	d@odm..	2

career

id	name
1	Ing de S. Sist
2	Ing. Catastral
3	Ing. Electrónica

"ROSA" == "rose" ?

LLM #1 hola
2 rose

id	name
1	hola
2	rose



Semi-Structured Data



Unstructured

PDFs, JPEGs,
MP3, Movies, ...

```
{ "name": "Repito",  
  "code": 123  
}
```

↔

Semi-structured

CSV, JSON, XML,
MongoDB, ...



Structured

Oracle, MSSQL,
MySQL, DB2, ...

```
<Person>  
<name>  
Repito  
</person>
```

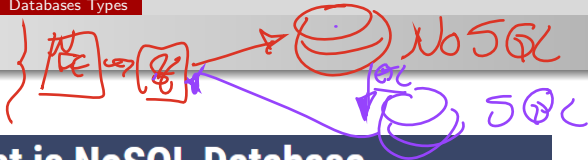
ETL

↑
Common

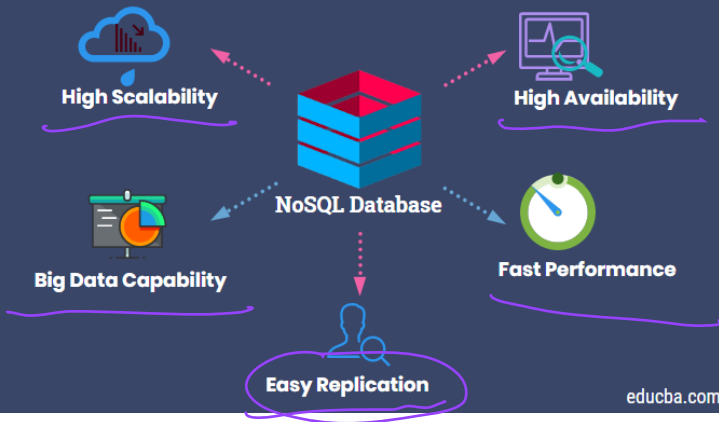


NoSQL DataBases

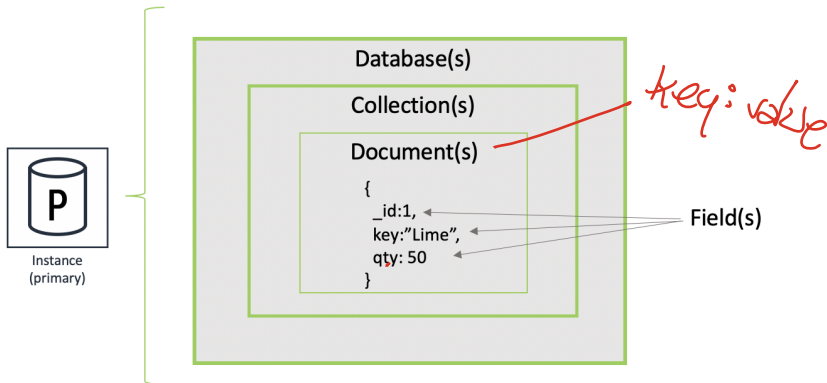
* methods



What is NoSQL Database



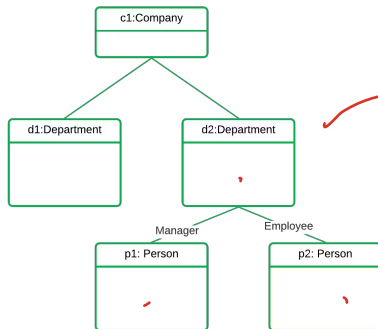
Document-Based NoSQL \Rightarrow MongoDB



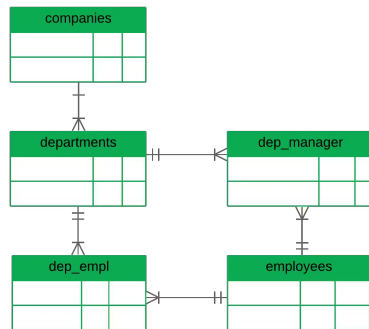
Object-Oriented NoSQL

OLM

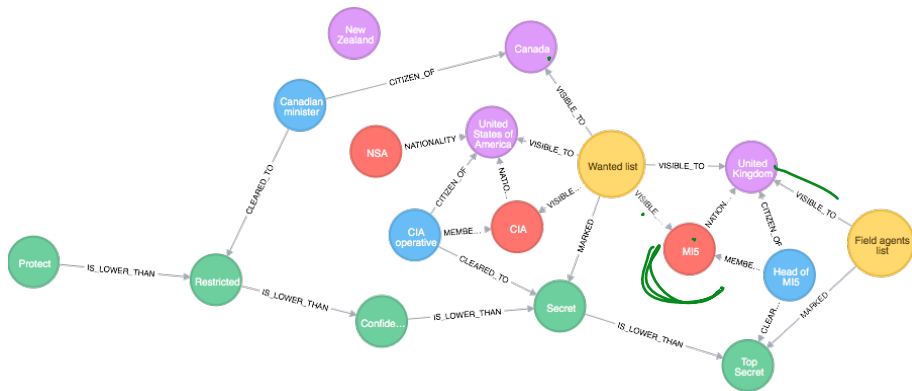
Object-Oriented



Relational



Graph-Based NoSQL



Outline

1 Databases Types

•

2 Entity-Relation Model (MER)



Basic Concepts

- **Entity**: A thing or **object** in the real world that is **distinguishable** from other **objects**.

- **Attribute**: A **property** or characteristic of an **entity**.

- **Relationship**: An **association** between entities.

- **Cardinality**: The number of instances of an entity that can be associated with another entity.

- **Degree**: The number of entities that participate in a relationship.

Entity → Properties

Information



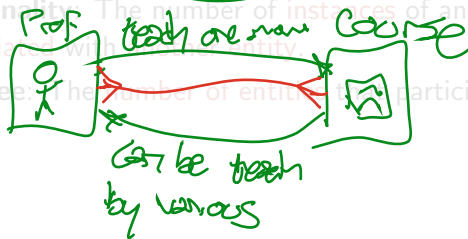
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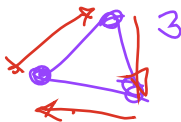
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Netflix

→ slaves

→ MOUSE

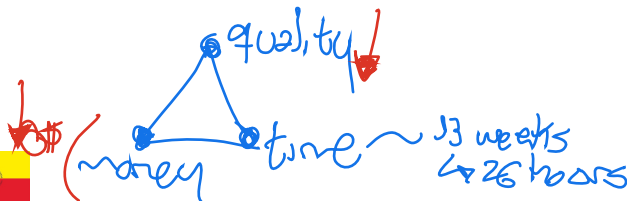
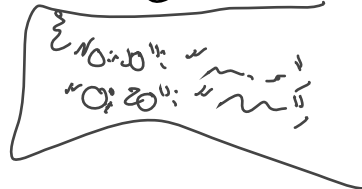
Answer ✓

→ forums

→ documents

Phase 2

Future Work



Step 2. Define Entities

→ ~~series~~→ episode ϵ_2 → user ϵ_4 → director ϵ_6 → story ϵ_8 → ~~movie~~→ song ϵ_{11} → multi media ϵ_{13} → video→ season ϵ_1 → category ϵ_3 → casting ϵ_5 → writer ϵ_7 → review ϵ_9 → genre_film ϵ_{10} → stats ϵ_{12} name description→ type-video ϵ_{14} 

- E1. Season = name, duration, date, description, review episodes
- E2. Episode = name, duration, date, description, casting, director, writer
- E3. Category = name, min image, stars
- E4. User = id, name, email, nickname, ~~password~~, birthday
- E5. Casting = name, description, awards
- E6. Director = name, history, filmography
- E7. Writer = name, history, filmography
- E8. Study = title, score, description, filmography
- E9. Review = stars, comment, timestamp, author

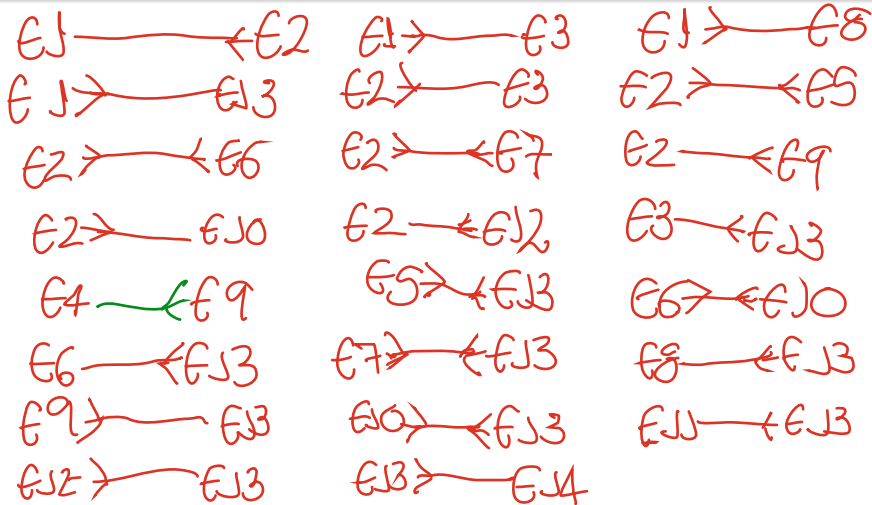


Step 4. Define Relationships

	E1	E2	E3	E4	E5	E6	E7	E8	E9	E10	E11	E12	E13	E14
E1		✓	✓					✓						
E2	✓		✓		✓	✓	✓		✓	✓		✓		
E3	✓	✓										✓		
E4									✓					
E5		✓										✓		
E6		✓							✓			✓		
E7		✓										✓		
E8	✓	✓										✓		
E9		✓		✓								✓		
E10		✓			✓							✓		
E11												✓		
E12		✓										✓		
E13	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
E14												✓	✓	



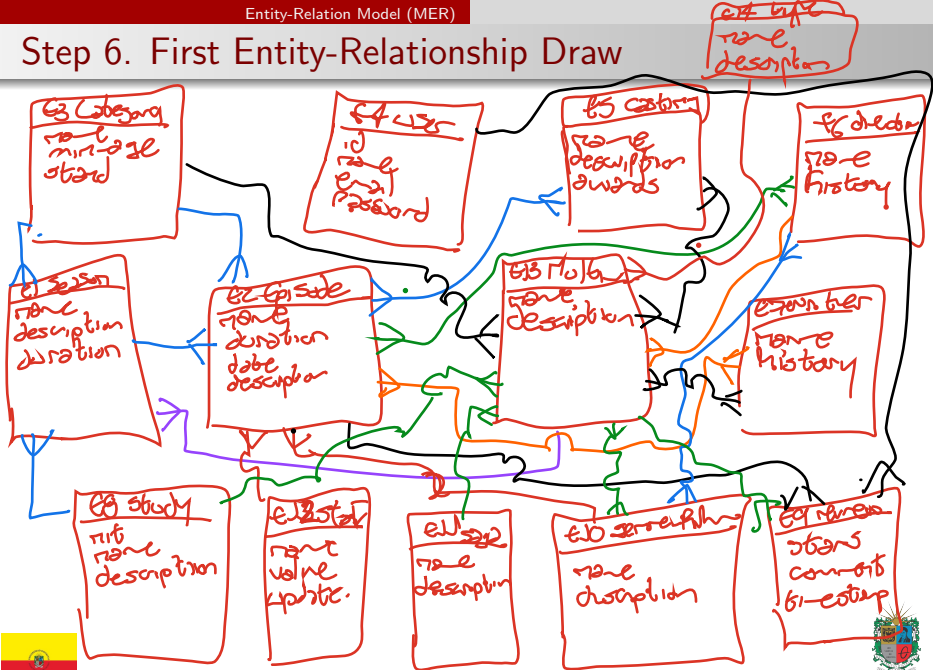
Step 5. Define Relationships Types



• User $\text{---} \leftarrow$ wishlist



Step 6. First Entity-Relationship Draw

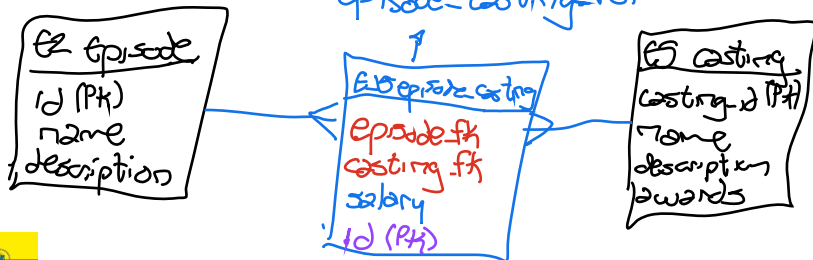
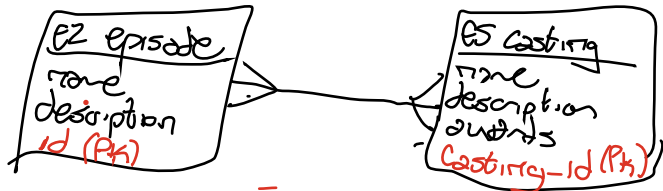


Step 7. First Split Many-to-Many Relationships

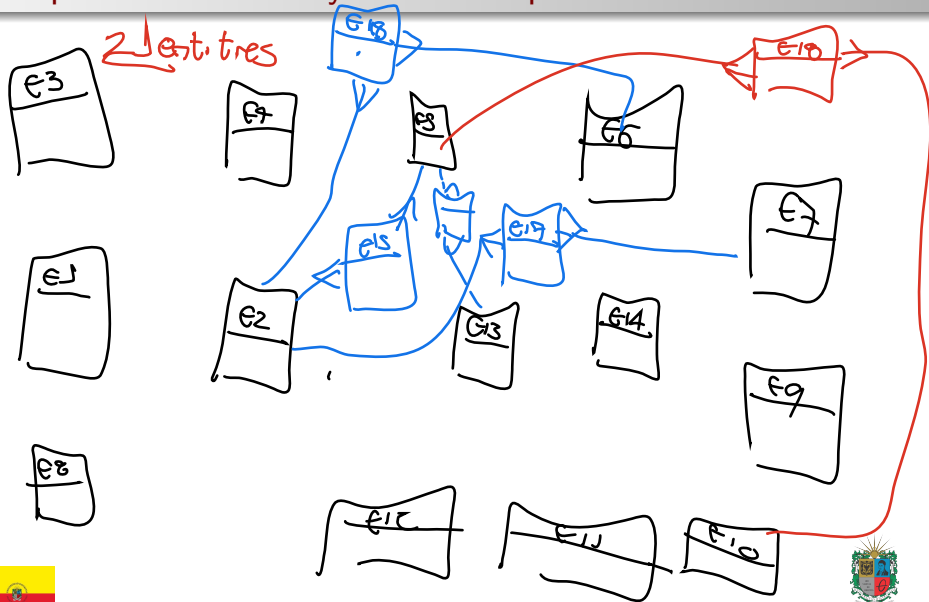
PK - natural / artificial

CPK

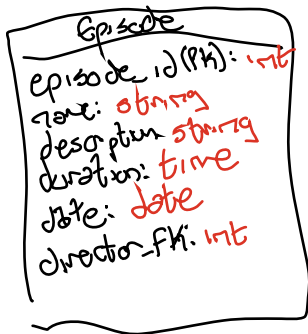
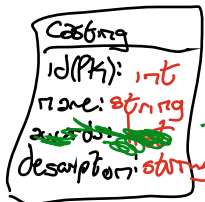
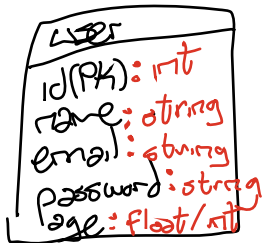
ep	cast
1	1
2	2
2	2
2	2



Step 8. Second Entity-Relationship Draw



Step 9. Get Data-Structure E-R M

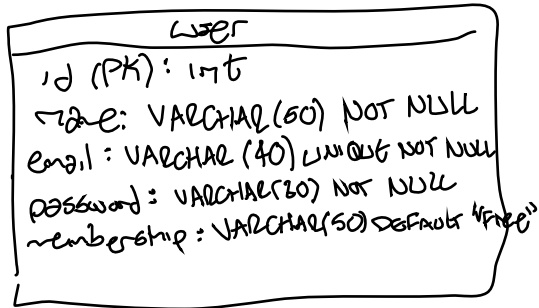


phone: string ~~~~
 int
 new code
 phone & entity
 ① number



Step 10. Define Constraints and Properties of Data

- string → Varchar (max) → limit size
- email → unique
- data {
 - mandatory → NOT NULL
 - optional (NULL)
- default → age DEFAULT 18
- Artificial PK → AUTO.INCREMENTAL



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Thanks!

Questions?



Repo: <https://github.com/EngAndres/ud-public/tree/main/courses/databases-foundations>

