

## Bases de Datos Relacionales vs. No Relacionales

### Respuestas

- ¿Cuáles son los principales elementos de una base de datos relacional?

Tablas, campos, registros, relaciones, consultas.

- ¿Cuáles son los principales elementos de una base de datos no relacional (*NoSQL*)?

Valor, Documentos, Campo, Colección.

- ¿Qué ventajas tiene usar una base de datos relacional?

Evita duplicidad de registros. Normaliza el contenido, haciéndolo más comprensible. Se piensa para sistemas altamente coherentes con restricciones.

- ¿Qué ventajas tiene usar una base de datos no relacional?

Son bases más abiertas y flexibles. Se pueden hacer cambios rápidos en esquemas.

- ¿Cuál es el mejor tipo de base de datos entonces?

No hay ninguna mejor, su uso dependerá de las necesidades del proyecto o cliente.

## Reto 1: Colecciones, Documentos y Proyecciones

Usando la base de datos *sample\_mflix*, proyecta los datos que se solicitan.

- Fecha, nombre y texto de cada comentario.

```
{
  project: {
    date: 1,
    name: 1,
    text: 1
  }
}
```



The screenshot shows the MongoDB Compass interface for the `sample_mflix.comments` collection. The `Documents` tab is active, displaying a query: `{date:1, name:1, text:1}`. The results show two documents:

- Document 1: `{_id: ObjectId("5a9427648b0beebe69579cc"), name: "Andrea Le", text: "Rem officiiis eaque repellendus amet eos doloribus. Porro dolor volupta...", date: 2012-03-26T23:20:16.000+00:00}`
- Document 2: `{_id: ObjectId("5a9427648b0beebe69579cf"), name: "Greg Powell", text: "Tenetur dolorum molestiae ea. Eligendi praesentium unde quod porro. Co...", date: 1987-02-10T00:29:36.000+00:00}`

- Título, elenco y año de cada película.

```
{
  project: {
    title: 1,
    cast: 1,
    year: 1
  }
}
```

## sample\_mflix.movies

Documents Aggregations Schema Explain Plan Indexes

FILTER

PROJECT {title:1,cast:1, year:1, \_id:0}

SORT

COLLATION

VIEW

cast: Array  
0: "Charles Kayser"  
1: "John Ott"  
title: "Blacksmith Scene"  
year: 1893

cast: Array  
title: "The Great Train Robbery"  
year: 1903

- Nombre y contraseña de cada usuario.

```
{
  project: {
    name: 1,
    password: 1
  }
}
```

## sample\_mflix.users

Documents Aggregations Schema Explain Plan Indexes

FILTER

PROJECT {\_id:0, name:1, password:1}

SORT

COLLATION

VIEW

name: "Ned Stark"  
password: "\$2b\$12\$UREFwsRUoyF0CRqGNK0Lz08HM/jLhgUCNNI39RJAqMUQ74cr1J1Vu"

name: "Robert Baratheon"  
password: "\$2b\$12\$yGqXL69LZpXA2xVdhuPn50Zd.VURVki7wgOLY3pn08s7U251Z032y"

name: "Jaime Lannister"  
password: "\$2b\$12\$6vz7wiw0.EI5Rilvq1ZUC./9480gb1uPTXcahDxiadgyC3PS8XCUK"

## Reto 2: Filtros básicos

- ¿Qué comentarios ha hecho Greg Powell?

```
{
  filter: {
    name: 'Greg Powell'
  }
}
```

## sample\_mflix.comments

Documents Aggregations Schema Explain Plan Indexes

FILTER {name: "Greg Powell"}

ADD DATA

VIEW

\_id: ObjectId("5a9427648b0beeb69579cf")  
name: "Greg Powell"  
email: "greg\_powell@fakegmail.com"  
movie\_id: ObjectId("573a1390f29313caabdc41b1")  
text: "Tenetur dolorum molestiae ea. Eligendi praesentium unde quod porro. Co..."  
date: 1987-02-10T00:29:36.000+00:00

\_id: ObjectId("5a9427648b0beeb6957afe")  
name: "Greg Powell"  
email: "greg\_powell@fakegmail.com"  
movie\_id: ObjectId("573a1391f29313caabdc754b")  
text: "Rem nostrum nobis saepe eaque itaque nemo. Fugit dignissimos nisi sapi..."  
date: 2013-03-26T16:20:03.000+00:00

- ¿Qué comentarios han hecho Greg Powell o Mercedes Tyler?

```
{
  filter: {
    $or: [
      {
        name: 'Greg Powell'
      },
      {
        name: 'Mercedes Tyler'
      }
    ]
  }
}
```

- ¿Cuál es el máximo número de comentarios en una película?

```
{
  project: {
    num_mflix_comments: 1
  },
  sort: {
    num_mflix_comments: -1
  },
  limit: 1
}
```

- ¿Cuál es título de las cinco películas más comentadas?

```
{
  project: {
    title: 1,
    num_mflix_comments: 1
  },
  sort: {
    num_mflix_comments: -1
  },
  limit: 5
}
```

## Ejercicios

Las consultas se realizarán sobre la base *sample\_training*.

1. Obtén los datos de contacto de cada compañía.

```
{
  project: {
    email_address: 1,
    phone_number: 1
  }
}
```

## sample\_training.companies

Documents Aggregations Schema Explain Plan

FILTER

PROJECT {email\_address:1,phone\_number:1}

SORT

COLLATION

VIEW

\_id: ObjectId("52cdef7c4bab8bd675297d8a")  
email\_address: "info@wetpaint.com"  
phone\_number: "206.859.6300"

\_id: ObjectId("52cdef7c4bab8bd675297d8e")  
email\_address: ""  
phone\_number: ""

\_id: ObjectId("52cdef7c4bab8bd675297d8f")

2. Obtén el identificador de la clase de cada calificación.

```
{
  project: {
    class_id: 1
  }
}
```

## sample\_training.grades

Documents Aggregations Schema Explai

FILTER

PROJECT {class\_id:1}

SORT

COLLATION

VIEW

\_id: ObjectId("56d5f7eb604eb380bd8d8ce")  
class\_id: 339

\_id: ObjectId("56d5f7eb604eb380bd8d8cf")  
class\_id: 350

\_id: ObjectId("56d5f7eb604eb380bd8d8d0")  
class\_id: 149

3. Obtén el nombre de todas las compañías fundadas en octubre.

```
{
  filter: {
    founded_month: 10
  },
  project: {
    name: 1,
    _id: 0
  }
}
```

## sample\_training.companies

Documents Aggregations Schema Explain Plan

FILTER {founded\_month:10}

PROJECT {name:1,\_id:0}

SORT

COLLATION

VIEW

name: "wetpaint"

name: "Powerset"

name: "TheFind"

name: "TechnologyGuide"

4. Obtén el nombre de todas las compañías fundadas en 2008.

```
{
  filter: {
    founded_year: 2008
  },
  project: {
    name: 1,
    _id: 0
  }
}
```

## sample\_training.companies

Documents Aggregations Schema

**FILTER** {founded\_year:2008}

**PROJECT** {name:1,\_id:0}

**SORT**

**COLLATION**

VIEW {}

name: "OpenX"

name: "WonderHowTo"

name: "First30Days"

5. Obtén todos los posts del autor *machine*.

```
{
  filter: {
    author: 'machine'
  }
}
```

## sample\_training.posts

DOCUMENT

Documents Aggregations Schema Explain Plan Indexes

**FILTER** {author:"machine"}

**ADD DATA** VIEW {}

\_id: ObjectId("50abef8bbcf1bfe2536dc3f9")

body: "Amendment I

<p>Congress shall make no law respecting an establishment ..."

permalink: "arjNnLZk3kTySpAiorGe"

author: "machine"

title: "Bill of Rights"

> tags: Array

> comments: Array

date: 2012-11-20T05:05:15.231+00:00

\_id: ObjectId("50abef8bbcf1bfe2536dc3fa")

body: "We the People of the United States, in order to form a more perfect Un..."

permalink: "jNsgObovWYKEoXnydtis"

author: "machine"

6. Obtén todas las calificaciones provenientes de los grupos 357, 57 y 465.

```
{
  filter: {
    class_id: {
      $in: [
        350,
        57,
        465
      ]
    }
  }
}
```

**FILTER** {class\_id: {\$in:[357,57,465]}}

**PROJECT**

**SORT**

**COLLATION**

**ADD DATA** VIEW {}

\_id: ObjectId("56d5f7eb604eb380b0d8d8d4")

student\_id: 0

> scores: Array

class\_id: 57

\_id: ObjectId("56d5f7eb604eb380b0d8d8df")

student\_id: 1

> scores: Array

class\_id: 465

Id: ObjectId("56d5f7eb604eb380b0d8d8d4")

7. Obtén todas las compañías fundadas en octubre del 2008.

```
{
  filter: {
    founded_month: 10,
    founded_year: 2008
  },
  project: {
    name: 1,
    founded_month: 1,
    founded_year: 1
  }
}
```

## sample\_training.companies

Documents Aggregations Schema Explain Plan

**FILTER** { \$and: [{ founded\_month: 10 }, { founded\_year: 2008 }] }

**PROJECT** { name: 1, founded\_month: 1, founded\_year: 1 }

**SORT**

**COLLATION**

VIEW   

```
{
  "_id": ObjectId("52cdef7c4bab8bd6752985ca"),
  "name": "tunesBag",
  "founded_year": 2008,
  "founded_month": 10
}
```

```
{
  "_id": ObjectId("52cdef7d4bab8bd675298d21"),
  "name": "Muecs",
  "founded_year": 2008,
  "founded_month": 10
}
```

```
{
  "_id": ObjectId("52cdef7d4bab8bd675299a43"),
  "name": "Ruch Mouse"
}
```

8. Obtén todas las compañías con más de 50 empleados.

```
{
  filter: {
    number_of_employees: {
      $gte: 50
    }
  },
  project: {
    name: 1,
    number_of_employees: 1
  }
}
```

## sample\_training.companies

Documents Aggregations Schema Explain Plan

**FILTER** { number\_of\_employees: { \$gte: 50 } }

**PROJECT** { name: 1, number\_of\_employees: 1 }

**SORT**

**COLLATION**

VIEW   

```
{
  "_id": ObjectId("52cdef7c4bab8bd675297d8e"),
  "name": "Facebook",
  "number_of_employees": 5299
}
```

```
{
  "_id": ObjectId("52cdef7c4bab8bd675297d94"),
  "name": "Twitter",
  "number_of_employees": 1300
}
```

```
{
  "_id": ObjectId("52cdef7c4bab8bd675297da2"),
  "name": "Cisco",
  "number_of_employees": 63000
}
```

9. Obtén las rutas con un número de paradas entre 1 y 5.




```
{
  filter: {
    $and: [
      {
        stops: {
          $gte: 1
        }
      },
      {
        stops: {
          $lte: 5
        }
      }
    ]
  }
}
```

## sample\_training.routes

Documents Aggregations Schema Explain Plan

**FILTER** { \$and: [{ stops: { \$gte: 1 } }, { stops: { \$lte: 5 } }] }

**ADD DATA**

VIEW   

```
{
  "_id": ObjectId("56e9b39b732b6122f8780243"),
  "airline": Object,
  "src_airport": "YRT",
  "dst_airport": "YEK",
  "codeshare": "",
  "stops": 1,
  "airplane": "ATR"
}
```

```
{
  "_id": ObjectId("56e9b39b732b6122f87818b3"),
  "airline": Object,
  "src_airport": "ABJ",
  "dst_airport": "BRU",
  "codeshare": "",
  "stops": 1,
  "airplane": "333"
}
```

10. Obtén la empresa con el menor número de empleados.

```
{
  filter: {
    number_of_employees: {
      $ne: null
    }
  },
  project: {
    number_of_employees: 1
  },
  sort: {
    number_of_employees: 1
  },
  limit: 1
}
```

sample\_training.companies

DOCUMENTS 9.5k TOTAL SIZE 34.8MB AVG. SIZE 3.7KB

Documents Aggregations Schema Explain Plan Indexes Validation

FILTER {number\_of\_employees: {\$ne:null}} PROJECT {name:1, number\_of\_employees:1} SORT {number\_of\_employees:1} COLLATION MAXTIMES SKIP 0 LIMIT 1

VIEW {}

Displaying document

```
_id: ObjectId("52cdef7c4bab8bd675297dbd")
name: "YouTube"
number_of_employees: 0
```

11. Obtén la empresa con el mayor número de empleados.

```
{
  project: {
    number_of_employees: 1
  },
  sort: {
    number_of_employees: -1
  },
  limit: 1
}
```

sample\_training.companies

DOCUMENTS 9.5k TOTAL SIZE 34.8MB AVG. SIZE 3.7KB

Documents Aggregations Schema Explain Plan Indexes Validation

FILTER PROJECT {name:1, number\_of\_employees:1} SORT {number\_of\_employees: -1} COLLATION MAXTIMES SKIP 0 LIMIT 1

VIEW {}

Displaying document

```
_id: ObjectId("52cdef7c4bab8bd67529856a")
name: "IBM"
number_of_employees: 300000
```

12. Obtén el viaje con mayor duración.

```
{
  project: {
    tripduration: 1
  },
  sort: {
    tripduration: -1
  },
  limit: 1
}
```

sample\_training.trips

DOCUMENTS 10.0k TOTAL SIZE 4.2MB AVG. SIZE 440B

Documents Aggregations Schema Explain Plan Indexes Validation

FILTER PROJECT {tripduration:1} SORT {tripduration: -1} COLLATION MAXTIMES SKIP 0 LIMIT 1

VIEW {}

Displaying document

```
_id: ObjectId("572bb8222b288919b68ac07c")
tripduration: 326222
```

13. Obtén el viaje con menor duración.

```
{
  project: {
    tripduration: 1
  },
  sort: {
    tripduration: 1
  },
  limit: 1
}
```

## sample\_training.trips

DOCUMENTS 10.0k TOTAL SIZE 4.2MB AVG. SIZE 440B

Documents

Aggregations

Schema

Explain Plan

Indexes

Validation

FILTER

OP

PROJECT {tripduration:1}

SORT {tripduration:1}

MAXTIMES

COLLATION

SKIP 0

LIMIT 1

VIEW

Displaying document

\_id: ObjectId("572bb8222b288919b68ac2d4")  
tripduration: 61