

JPA Annotations: SQL vs MongoDB

SQL (JPA)

MongoDB (Spring Data MongoDB)



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@Entity

@Document



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JPA Annotations: SQL vs MongoDB (cont)

```
@Table (name = " nome_t abe lla ") @Docum ent (co lle ction = " nome_c oll ezi one ")
```



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JPA Annotations: SQL vs MongoDB (cont)

@Id

@Id



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JPA Annotations: SQL vs MongoDB (cont)

```
@Column(name = "nome_colonna")
```

```
@Field("nome_campo")
```



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JPA Annotations: SQL vs MongoDB (cont)

```
@GeneratedValue(strategy = GenerationType.IDENTITY) @Field(targetType = FieldType.OBJECT_ID)
```



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JPA Annotations: SQL vs MongoDB (cont)

@ManyToOne (relazioni tra tabelle)

@DBRef



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JPA Annotations: SQL vs MongoDB (cont)

@OneToMany (relazioni tra tabelle)

@DBRef



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JPA Annotations: SQL vs MongoDB (cont)

@JoinColumn(name = "nome_colonna_esterna")`

- (le relazioni sono gestite automaticamente da MongoDB)



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JPA Annotations: SQL vs MongoDB (cont)

JpaRepository

MongoRepository



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JPA Annotations: SQL vs MongoDB (cont)

```
@Query ("SELECT ...")
```

```
@Query ("{ 'campo': 'valore' }")
```



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JPA Annotations: SQL vs MongoDB (cont)

@Named Queries

- (query specifiche possono essere scritte come stringhe)



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JPA Annotations: SQL vs MongoDB (cont)

Transazioni (es. @Transactional)

Transazioni (gestite automaticamente da MongoDB)

Add/Edit/Delete Schema

SQL Command

MongoDB Command

Add/Edit/Delete Schema (cont)

CREATE DATABASE

use

dbName

[dbName]



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Add/Edit/Delete Schema (cont)

```
CREATE TABLE tableName db.create-  
(column1 datatype, column2 Collectio-  
datatype, ...) n("tableNa-  
me")
```

Add/Edit/Delete Schema (cont)

```
CREATE TABLE db.testTable.in-  
tableName (column1 sert({ column-  
datatype, column2 1Value, column-  
datatype, ...) 2Value, ... })
```

Add/Edit/Delete Schema (cont)

```
CREATE INDEX db.testTable.en-  
idx_test ON sureIndex({  
tableName (column) column: 1 })
```



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Add/Edit/Delete Schema (cont)

DROP TABLE	db.testTa-
tableName	ble.drop()

CRUD

Insert	Description
Methods	

CRUD (cont)

```
db.collec tion.insertone( document)
```



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CRUD (cont)

```
db.collec tion.insertMany ([{}], {})
```

CRUD (cont)

Read Methods

multiple documents into a collection (requires square brackets).

CRUD (cont)

```
db.collec tion.find (filter, options)
```



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CRUD (cont)

```
db.collection.findOne(filter, options)
```

CRUD (cont)

Update Methods

first document matching the specified filter.

CRUD (cont)

```
db.collection.updateOne(filter, options)
```



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CRUD (cont)

db.collection.updateMany(filter, replacementOptions)

CRUD (cont)

Updates
One (filter) or all documents that match a specified filter.

CRUD (cont)

Delete Methods
at most a single document that matches a specified filter.



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CRUD (cont)

db.collection.deleteOne(filter, options)

CRUD (cont)

Deletes at most a single document that matches a specified filter.

CRUD (cont)

Deletes all documents that match a specified filter.



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RDB Concepts to NO SQL

RDBMS

MongoDB

RDB Concepts to NO SQL (cont)

Database

Database



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RDB Concepts to NO SQL (cont)

Table, View	Collection
-------------	------------

RDB Concepts to NO SQL (cont)

Row	Document (BSON)
-----	-----------------

RDB Concepts to NO SQL (cont)

Column	Field
--------	-------



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RDB Concepts to NO SQL (cont)

Index Index

RDB Concepts to NO SQL (cont)

Table joins \$lookup, embedded documents

RDB Concepts to NO SQL (cont)

Primary key Primary key (In MongoDB, the primary key is automatically set to the _id field.)



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RDB Concepts to NO SQL (cont)

Foreign Key	Reference
-------------	-----------

RDB Concepts to NO SQL (cont)

Partition	Shard
-----------	-------

Basic Commands MongoDB

Name	Description
------	-------------



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Basic Commands MongoDB (cont)

db Show the name of the current database

Basic Commands MongoDB (cont)

mongod Start the database

Basic Commands MongoDB (cont)

mongo Connect to the database/Start the mongo shell



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Basic Commands MongoDB (cont)

`show dbs` **Show databases**

Basic Commands MongoDB (cont)

`use db` **Switch to a specific database**

Basic Commands MongoDB (cont)

`show collections` **Display current database collections**



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Basic Commands MongoDB (cont)

help	Get help
------	----------

Comparison Query Operators

Name	Description
------	-------------

Comparison Query Operators (cont)

\$eq	Matches values that are equal to a specified value.
------	---



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Comparison Query Operators (cont)

`$gt` Matches values that are greater than a specified value.

Comparison Query Operators (cont)

`$gte` Matches values that are greater than or equal to a specified value.

Comparison Query Operators (cont)

`$in` Matches any of the values specified in an array.



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Comparison Query Operators (cont)

`$lt` Matches values that are less than a specified value.

Comparison Query Operators (cont)

`$lte` Matches values that are less than or equal to a specified value.

Comparison Query Operators (cont)

`$ne` Matches all values that are not equal to a specified value.



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Comparison Query Operators (cont)

`$nin` Matches none of the values specified in an array.

Logical Query Operators

Name	Description
------	-------------

Logical Query Operators (cont)

`$and` Joins query clauses with a logical AND and returns all documents that match the conditions of both clauses.



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Logical Query Operators (cont)

`$not` Inverts the effect of a query expression and returns documents that do not match the query expression.

Logical Query Operators (cont)

`$nor` Joins query clauses with a logical NOR and returns all documents that fail to match both clauses.

Logical Query Operators (cont)

`$or` Joins query clauses with a logical OR and returns all documents that match the conditions of either clause.



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Element Query Operators

Name	Description
------	-------------

Element Query Operators (cont)

<code>\$exists</code>	Matches documents that have the specified field.
-----------------------	--

Element Query Operators (cont)

<code>\$type</code>	Selects documents if a field is of the specified type. For example, <code>{field: {\$type: "string"}}</code> will return documents where the field is of type string. This operator is useful for filtering documents based on the data type of a particular field.
---------------------	---



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BSON Types

Type	Number	Alias	Notes
------	--------	-------	-------

BSON Types (cont)

Double	1	"double"	Represents a double-precision floating-point number (64 bits).
--------	---	----------	--

BSON Types (cont)

String	2	"string"	Represents a UTF-8 string.
--------	---	----------	----------------------------



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BSON Types (cont)

Object	3	"object"	Represents a nested BSON document.
--------	---	----------	------------------------------------

BSON Types (cont)

Array	4	"array"	Represents an ordered list of values.
-------	---	---------	---------------------------------------

BSON Types (cont)

Binary data	5	"binData"	Represents binary data.
-------------	---	-----------	-------------------------



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BSON Types (cont)

Undefined	6	"undefined"	Deprecated and no longer used. (Deprecated)
-----------	---	-------------	---

BSON Types (cont)

ObjectId	7	"objectId"	Represents a 12-byte identifier typically employed as a unique identifier for documents.
----------	---	------------	--

BSON Types (cont)

Boolean	8	"bool"	Represents a boolean value (true or false).
---------	---	--------	---



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BSON Types (cont)

Date	9	"date"	Represents a 64-bit integer timestamp, indicating a specific moment in time.
------	---	--------	--

BSON Types (cont)

Null	10	"null"	Represents a null value.
------	----	--------	--------------------------

BSON Types (cont)

Regular Expression	11	"regex"	Represents a regular expression.
--------------------	----	---------	----------------------------------



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BSON Types (cont)

DBPointer	12	"dbPointer"	Deprecated and no longer used. (Deprecated)
-----------	----	-------------	---

BSON Types (cont)

JavaScript	13	"javascript"	Represents JavaScript code.
------------	----	--------------	-----------------------------

BSON Types (cont)

Symbol	14	"symbol" (Deprecated)	Deprecated and no longer used.
--------	----	-----------------------	--------------------------------



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BSON Types (cont)

JavaScript code with scope	15	"javasc-riptWithScope"	Deprecated and no longer used in MongoDB 4.4 onwards.
----------------------------	----	------------------------	---

BSON Types (cont)

32-bit integer	16	"int"	Represents a 32-bit integer.
----------------	----	-------	------------------------------

BSON Types (cont)

Timestamp	17	"timest-amp"	Represents a timestamp, typically used for insertion operations.
-----------	----	--------------	--



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BSON Types (cont)

64-bit integer	18	"long"	Represents a 64-bit integer.
----------------	----	--------	------------------------------

BSON Types (cont)

Decimal 128	19	"decimal"	Represents a 128-bit decimal value.
-------------	----	-----------	-------------------------------------

BSON Types (cont)

Min key	- 1	"minKey"	Represents the smallest BSON element value.
---------	-----	----------	---



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BSON Types (cont)

Max key	127	"maxKey"	Represents the largest BSON element value.
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