

MongoDB Query Operators – Student Notes

Use these notes to understand MongoDB query operators conceptually. Practice writing queries on your own.

1. Comparison Operators

Used to compare field values in documents.

Operators include:

- \$eq – equal to
- \$ne – not equal to
- \$gt / \$gte – greater than / greater than or equal to
- \$lt / \$lte – less than / less than or equal to
- \$in / \$nin – match values inside or outside a list

Syntax pattern:

```
{ field: { operator: value } }
```

2. Logical Operators

Used to combine multiple conditions.

Operators include:

- \$and – all conditions must match
- \$or – at least one condition must match
- \$not – negates a condition
- \$nor – none of the conditions should match

Syntax pattern:

```
{ $or: [ condition1, condition2 ] }
```

3. Array Operators

Used when fields contain arrays.

Important concepts:

- Dot notation – matches values inside array objects
- \$elemMatch – ensures multiple conditions apply to the same array element
- \$size – matches arrays of an exact length

Key rule:

Use \$elemMatch when checking more than one condition on array elements.

4. Expressions (\$expr)

Used to perform computed comparisons inside queries.

- Allows comparison between fields or computed values
- Commonly used with \$size for array length comparisons

Syntax pattern:

```
{ $expr: { operator: [ expression1, expression2 ] } }
```

5. Projection

Controls which fields are returned in query results.

- Include fields using 1
- Exclude fields using 0
- `_id` can be excluded independently

Rule:

Do not mix inclusion and exclusion (except `_id`).

6. Sorting and Limiting

Used to control result order and count.

- `sort({ field: 1 })` – ascending
- `sort({ field: -1 })` – descending
- `limit(n)` – restrict number of documents returned

These are applied after `find()`.