

Practical 4

INDEXING USING MongoDB

17-01-25

Write-up: -

- Indexing in mongodb
- Types of indexing
- Document document-oriented NoSQL

Q1. MongoDB indexing

a. Create index in MongoDB

```
test> use students
```

```
switched to db students
```

```
students> db.createCollection("studentgrades")
```

```
{ ok: 1 }
```

```
students> db.studentgrades.insertMany(
```

```
... [
```

```
... {name: "Barry", subject: "Maths", score: 92},
```

```
... {name: "Kent", subject: "Physics", score: 87},
```

```
... {name: "Harry", subject: "Maths", score: 99, notes: "Exceptional  
Performance"},
```

```
... {name: "Alex", subject: "Literature", score: 78},
```

```
... {name: "Tom", subject: "History", score: 65, notes: "Adequate"}]
```

```
... )
```

```
{
```

```
acknowledged: true,  
insertedIds: {  
  '0': ObjectId('678a268b9966c85063b51856'),  
  '1': ObjectId('678a268b9966c85063b51857'),  
  '2': ObjectId('678a268b9966c85063b51858'),  
  '3': ObjectId('678a268b9966c85063b51859'),  
  '4': ObjectId('678a268b9966c85063b5185a')  
}  
}
```

b. Finding the indexes in a collection

```
students> db.studentgrades.find({}, {_id:0})  
[  
  { name: 'Barry', subject: 'Maths', score: 92 },  
  { name: 'Kent', subject: 'Physics', score: 87 },  
  {  
    name: 'Harry',  
    subject: 'Maths',  
    score: 99,  
    notes: 'Exceptional Performance'  
  },  
  { name: 'Alex', subject: 'Literature', score: 78 },  
  { name: 'Tom', subject: 'History', score: 65, notes: 'Adequate' }  
]  
students> db.studentgrades.find().pretty()  
[  
  {
```

```
_id: ObjectId('678a268b9966c85063b51856'),
name: 'Barry',
subject: 'Maths',
score: 92
},
{
  _id: ObjectId('678a268b9966c85063b51857'),
  name: 'Kent',
  subject: 'Physics',
  score: 87
},
{
  _id: ObjectId('678a268b9966c85063b51858'),
  name: 'Harry',
  subject: 'Maths',
  score: 99,
  notes: 'Exceptional Performance'
},
{
  _id: ObjectId('678a268b9966c85063b51859'),
  name: 'Alex',
  subject: 'Literature',
  score: 78
},
{
  _id: ObjectId('678a268b9966c85063b5185a'),
  name: 'Tom',
```

```
    subject: 'History',  
    score: 65,  
    notes: 'Adequate'  
  }  
]  
students> db.studentgrades.createIndex( {name: 1}, {name: "student  
name index"} )  
student name index
```

```
students> db.studentgrades.getIndexes()  
[  
  { v: 2, key: { _id: 1 }, name: '_id_' },  
  { v: 2, key: { name: 1 }, name: 'student name index' }  
]
```

c. Drop indexes in a collection

```
students> db.studentgrades.dropIndex("student name index")  
{ nIndexesWas: 2, ok: 1 }
```

```
students> db.studentgrades.getIndexes()  
[ { v: 2, key: { _id: 1 }, name: '_id_' } ]
```

You can also use the index field value for removing an index without a defined name: `db.studentgrades.dropIndex({name:1})`

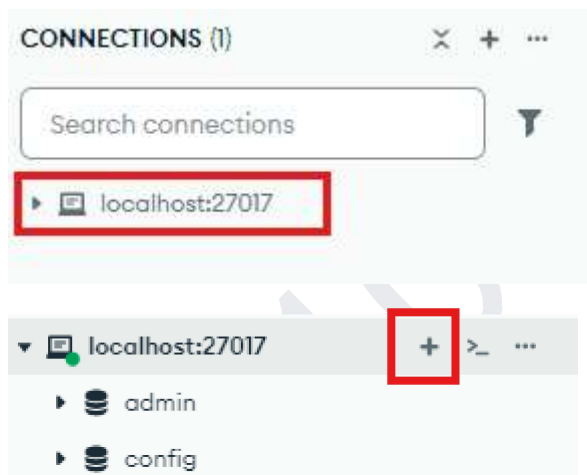
d. Drop all the indexes

```
students> db.studentgrades.dropIndexes()
```

```
{  
  nIndexesWas: 1,  
  msg: 'non-_id indexes dropped for collection',  
  ok: 1  
}
```

```
students> db.studentgrades.getIndexes()  
[ { v: 2, key: { _id: 1 }, name: '_id_' } ]
```

Q2) Create all the types of indexes (discussed in class) which will help in finding certain words in a document by using AIRPORT (dataset).



Create Database

Database Name

practical_3

Collection Name

airport

☐ Time-Series

Time-series collections efficiently store sequences of measurements over a period of time. [Learn More](#)

> **Additional preferences** (e.g. Custom collation, Capped, Clustered collections)

Cancel

Create Database



This collection has no data

It only takes a few seconds to import data from a JSON or CSV file.

Import Data

flights.csv

raw-flight-data.csv

airports.csv

Import

To collection practical_3.airport

Import file: airports.csv

Options

Select delimiter Comma

☒ Ignore empty strings

☐ Stop on errors

Specify Fields and Types [Learn more about data types](#)

	<input checked="" type="checkbox"/> airport_id Int32	<input checked="" type="checkbox"/> city String	<input checked="" type="checkbox"/> state String	<input checked="" type="checkbox"/> name String
1	10165	Adak Island	AK	Adak
2	10299	Anchorage	AK	Ted Stevens Anchorage International
3	10304	Aniak	AK	Aniak Airport
4	10754	Barrow	AK	Wiley Post/Will Rogers Memorial
5	10551	Bethel	AK	Bethel Airport

Cancel

Import

Documents 365 Aggregations Schema **Indexes 1** Validation

Create Index

Refresh

VIEWING

INDEXES

SEARCH INDEXES

Name & Definition	Type	Size	Usage	Properties	Status
> _id_	REGULAR	20.5 KB	2 (since Fri Jan 17 2025)	UNIQUE	READY

Documents 365

Aggregations

Schema

Indexes 1

Validation

Create Index

Refresh

Name & Definition

Type

Size

Usage

> _id_

REGULAR

20.5 KB

3 (since Fri Jan 17 2025)

Create Index

practical_3.airport

Index fields

airport_id

1 (asc)

+

> Options

Cancel

Create Index

Create Index

practical_3.airport

Index fields

city

-1 (desc)

+

> Options

Cancel

Create Index

Create Index

practical_3.airport

Index fields

name

text

+

> Options

Cancel

Create Index

Name & Definition	Type	Size	Usage	Properties	Status
> _id_	REGULAR	20.5 KB	3 (since Fri Jan 17 2025)	UNIQUE	READY
> airport_id_1	REGULAR	20.5 KB	0 (since Fri Jan 17 2025)		READY
> city_-1	REGULAR	24.6 KB	0 (since Fri Jan 17 2025)		READY
> name_text	TEXT	41.0 KB	0 (since Fri Jan 17 2025)		READY

localhost:27017 > practical_3 > airport

Documents 365

Aggregations

Schema

Indexes 1

Validation

Type a query: { field: 'value' } or [Generate query](#)

ADD DATA

EXPORT DATA

UPDATE

DELETE

Documents 365 Aggregations **Schema** Indexes 4 Validation

{ state: "AK" } [Generate query](#) [Reset](#) [Analyze](#)

Project { field: 0 }

Sort { field: -1 } or [['field', -1]] **Max Time MS** 60000

Collation { locale: 'simple' } **Skip** 0 **Limit** 0

Index Hint airport_id

_id
objectId

Inserted: 2025-01-17 09:59:20

airport_id
int32

13873 15841 14828 12819 10754 10245 14256 11445 11336 10170 15991 10304 10926 10561 14709 10165 12623 11997 10299 12807

city
string

Deadhorse Anchorage Cordova Petersburg Aniak Juneau Nome Ketchikan Wrangell St. Mary's Unalaska King Salmon Fairbanks Bethel Yakutat Dillingham Sitka Barrow Adak Island Kodiak

name
string

Aniak Airport Ketchikan International Deadhorse Airport Petersburg James A Johnson Dillingham Airport Adak Bethel Airport Juneau International Nome Airport King Salmon Airport Sitka Rocky Gutierrez Wiley Post/Will Rogers Memorial Kodiak Airport St. Mary's Airport Ralph Wien Memorial Wrangell Airport Gustavus Airport Unalaska Airport Yakutat Airport Fairbanks International