

## MAI172: Advance Database Technologies

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Experiment Number and Name: 10 Indexes in MongoDB

Date: 19/09/2024 Time: 9.45 am to 11.45 am

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### 1. Create a Simple Index (create collection with respect to your domain and insert minimum 10 instances in a collection, display the created index how it helps is search optimization)

#### Inserting records:

Query:

```
db.patients.insertMany([{"patient_id":"P001","name":"John Doe","age":45,"gender":"Male","address":"123 Main St,Bengaluru","phone":"9876543210","email":"john.doe@example.com","medical_history":["hypertension","diabetes"],"current_medications":["metformin","lisinopril"],"allergies":["penicillin"],"emergency_contact":{"name":"Jane Doe","relationship":"Wife","phone":"9876543211"}}, {"patient_id":"P002","name":"Alice Smith","age":30,"gender":"Female","address":"456 Elm St,Bengaluru","phone":"9876543212","email":"alice.smith@example.com","medical_history":["asthma"],"current_medications":["albuterol"],"allergies":["nuts"],"emergency_contact":{"name":"Bob Smith","relationship":"Husband","phone":"9876543213"}}, {"patient_id":"P003","name":"Bob Johnson","age":60,"gender":"Male","address":"789 Pine St,Bengaluru","phone":"9876543214","email":"bob.johnson@example.com","medical_history":["heart disease"],"current_medications":["atorvastatin"],"allergies":["shellfish"],"emergency_contact":{"name":"Mary Johnson","relationship":"Daughter","phone":"9876543215"}}, {"patient_id":"P004","name":"Mary Lee","age":50,"gender":"Female","address":"101 Maple St,Bengaluru","phone":"9876543216","email":"mary.lee@example.com","medical_history":["arthritis"],"current_medications":["ibuprofen"],"allergies":["latex"],"emergency_contact":{"name":"Tom Lee","relationship":"Son","phone":"9876543217"}}, {"patient_id":"P005","name":"Tom Brown","age":35,"gender":"Male","address":"202 Oak St,Bengaluru","phone":"9876543218","email":"tom.brown@example.com","medical_history":["migraines"],"current_medications":["sumatriptan"],"allergies":["pollen"],"emergency_contact":{"name":"Sara Brown","relationship":"Sister","phone":"9876543219"}}, {"patient_id":"P006","name":"Sara White","age":40,"gender":"Female","address":"303 Birch St,Bengaluru","phone":"9876543220","email":"sara.white@example.com","medical_history":["thyroid disorder"],"current_medications":["levothyroxine"],"allergies":["gluten"],"emergency_contact":{"name":"Jake White","relationship":"Brother","phone":"9876543221"}}, {"patient_id":"P007","name":"Jake Green","age":55,"gender":"Male","address":"404 Cedar St,Bengaluru","phone":"9876543222","email":"jake.green@example.com","medical_history":["high cholesterol"],"current_medications":["rosuvastatin"],"allergies":["dust"],"emergency_contact":{"name":"Lily Green","relationship":"Wife","phone":"9876543223"}}, {"patient_id":"P008","name":"Lily Black","age":28,"gender":"Female","address":"505 Walnut St,Bengaluru","phone":"9876543224","email":"lily.black@example.com","medical_history":["eczema"],"current_
```

```

        medications":["hydrocortisone"],"allergies":["soy"],"emergency_contact":{"name":"Sam
        Black","relationship":"Husband","phone":"9876543225"}},
        {"patient_id":"P009","name":"Sam Blue","age":65,"gender":"Male","address":"606 Chestnut St,
        Bengaluru","phone":"9876543226","email":"sam.blue@example.com","medical_history":["COPD"],"current_
        medications":["tiotropium"],"allergies":["mold"],"emergency_contact":{"name":"Nina
        Blue","relationship":"Wife","phone":"9876543227"}},
        {"patient_id":"P010","name":"Nina Red","age":38,"gender":"Female","address":"707 Spruce St,
        Bengaluru","phone":"9876543228","email":"nina.red@example.com","medical_history":["anemia"],"current_
        medications":["ferrous sulfate"],"allergies":["peanuts"],"emergency_contact":{"name":"Tom
        Red","relationship":"Husband","phone":"9876543229"}}})

```

Output:

```

{
  acknowledged: true,
  insertedIds: {
    '0': ObjectId('66ebb7449ea52709583b4f3d')
  }
}

```

Inference: Inserting data to the database

### Creating Index (Simple index):

Query:

```
db.Patient.createIndex({patient_id: 1})
```

Output:

```

> db.Patient.createIndex({patient_id: 1})
< patient_id_1

```

Inference: Creating index on patient\_id

### Display the index:

Query:

```
db.Patient.getIndexes()
```

Output:

```

< [
  { v: 2, key: { _id: 1 }, name: '_id' },
  { v: 2, key: { patient_id: 1 }, name: 'patient_id_1' }
]

```

Inference: Displayed the created index

## 2. View all the indexes

Query:

```
db.Patient.getIndexes()
```

Output:

```
< [
  { v: 2, key: { _id: 1 }, name: '_id_ ' },
  { v: 2, key: { patient_id: 1 }, name: 'patient_id_1' }
]
```

Inference: Displayed the created index

### 3. Create a compound index

Query:

```
db.Patient.createIndex({"patient_id": 1, "name": 1})
```

Output:

```
> db.Patient.createIndex({"patient_id": 1, "name": 1})
< patient_id_1_name_1
```

Inference: Created compound index on patient\_id and name columns.

### 4. Create and use compound index with sorting

Query:

```
db.Patient.createIndex({"patient_id": 1, "name": 1})
```

Output:

```
> db.Patient.createIndex({"patient_id": 1, "name": 1})
< patient_id_1_name_1
```

Inference: Created compound index on patient\_id and name columns.

### 5. Drop all indexes

Query:

```
db.Patient.dropIndexes()
```

Output:

```
< {
  nIndexesWas: 2,
  msg: 'non-_id indexes dropped for collection',
  ok: 1
}
```

Inference: Dropped all the indexes created.

## 6. Create a Multikey indexes for an array variables.

Query:

```
db.patients.createIndex({ medical_history: 1 })
```

Output:

```
> db.patients.createIndex({ medical_history: 1 })  
< medical_history_1
```

```
[  
  { v: 2, key: { _id: 1 }, name: '_id_' },  
  { v: 2, key: { medical_history: 1 }, name: 'medical_history_1' }  
]
```

Inference: Created multi-key index by using medical history.