

Program Code -

```
db.users.insertMany([
  { _id: 1, name: "Alice", age: 28, tags:
  ["mongodb", "database"], location: { type:
  "Point", coordinates: [40, 5] }, bio:
  "Loves coding in MongoDB" },
  { _id: 2, name: "Bob", age: 32, tags:
  ["nodejs", "backend"], location: { type:
  "Point", coordinates: [42, 7] }, bio:
  "Backend developer" },
  { _id: 3, name: "Charlie", age: 28,
  tags: ["mongodb", "backend"], location: {
  type: "Point", coordinates: [41, 6] },
  bio: "Fullstack developer" },
  { _id: 4, name: "David", age: 24, tags:
  [], location: { type: "Point",
  coordinates: [39, 4] }, bio: "Data
  scientist" }
]);

db.users.createIndex({ age: 1
}); // Single-field index
db.users.createIndex({ age: 1, name: -1
}); // Compound index
db.users.createIndex({ tags: 1
}); // Multikey index
db.users.createIndex({ location:
  "2dsphere" }); // Geospatial index
db.users.createIndex({ bio: "text"
}); // Text index
db.users.createIndex({ name: "hashed"
}); // Hashed index

db.users.getIndexes();

db.users.find({ age: 28 }).sort({ name: 1
}).toArray();

db.users.findOne({ name: "Alice" });

db.users.countDocuments({ age: { $gt: 25 }
});

db.users.distinct("age");

db.users.updateOne({ name: "Alice" }, {
  $set: { age: 29 } });

db.users.findOne({ name: "Alice" });

db.users.aggregate([
  { $match: { age: { $gte: 25 } } },
  { $group: { _id: "$age", count: { $sum:
  1 } } },
  { $sort: { count: -1 } }
]).toArray();

db.users.aggregate([
  { $unwind: "$tags" },
  { $group: { _id: "$tags", count: { $sum:
  1 } } }
]).toArray();

db.users.aggregate([
  {
    $geoNear: {
      near: { type: "Point", coordinates:
      [40, 5] },
      distanceField: "dist.calculated",
      maxDistance: 100000,
      spherical: true
    }
  }
]).toArray();

db.users.find({ $text: { $search: "MongoDB
backend" } }).toArray();
```

Output –

```
test> ... .. { acknowledged: true, insertedIds: {
'0': 1, '1': 2, '2': 3, '3': 4 } }

test>

test> age_1

test> age_1_name_-1

test> tags_1

test> location_2dsphere

test> bio_text

test> name_hashed

test>

test> [
  { v: 2, key: { _id: 1 }, name: '_id_' },
  { v: 2, key: { age: 1 }, name: 'age_1' },
```

```

{ v: 2, key: { age: 1, name: -1 }, name: 'age_1_name_-
1' },
{ v: 2, key: { tags: 1 }, name: 'tags_1' },
{
  v: 2,
  key: { location: '2dsphere' },
  name: 'location_2dsphere',
  '2dsphereIndexVersion': 3
},
{
  v: 2,
  key: { _fts: 'text', _ftsx: 1 },
  name: 'bio_text',
  weights: { bio: 1 },
  default_language: 'english',
  language_override: 'language',
  textIndexVersion: 3
},
{ v: 2, key: { name: 'hashed' }, name: 'name_hashed' }
]
test>
test> [
  {
    _id: 1,
    name: 'Alice',
    age: 28,
    tags: [ 'mongodb', 'database' ],
    location: { type: 'Point', coordinates: [ 40, 5 ] },
    bio: 'Loves coding in MongoDB'
  },
  {
    _id: 3,
    name: 'Charlie',
    age: 28,

```

```

tags: [ 'mongodb', 'backend' ],
location: { type: 'Point', coordinates: [ 41, 6 ] },
bio: 'Fullstack developer'
}
]
test>
test> {
  _id: 1,
  name: 'Alice',
  age: 28,
  tags: [ 'mongodb', 'database' ],
  location: { type: 'Point', coordinates: [ 40, 5 ] },
  bio: 'Loves coding in MongoDB'
}
test>
test> 3
test>
test> [ null, 24, 28, 32 ]
test>
test> {
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
test>
test> {
  _id: 1,
  name: 'Alice',
  age: 29,
  tags: [ 'mongodb', 'database' ],
  location: { type: 'Point', coordinates: [ 40, 5 ] },
  bio: 'Loves coding in MongoDB'
}

```

```

}
test>
test> ... .. [ { _id: 28, count: 1 }, { _id: 29, count: 1 }, { _id: 32, count: 1 } ]
test>
test> ... .. [
  { _id: 'backend', count: 2 },
  { _id: 'nodejs', count: 1 },
  { _id: 'mongodb', count: 2 },
  { _id: 'database', count: 1 }
]
test>
test> ... .. [
  {
    _id: 1,
    name: 'Alice',
    age: 29,

    _id: 1,
    name: 'Alice',
    age: 29,
    tags: [ 'mongodb', 'database' ],
    location: { type: 'Point', coordinates: [ 40, 5 ] },
    bio: 'Loves coding in MongoDB'
  }
]
test>

```

```

tags: [ 'mongodb', 'database' ],
location: { type: 'Point', coordinates: [ 40, 5 ] },
bio: 'Loves coding in MongoDB',
dist: { calculated: 0 }
}
]
test>
test> [
  {
    _id: 2,
    name: 'Bob',
    age: 32,
    tags: [ 'nodejs', 'backend' ],
    location: { type: 'Point', coordinates: [ 42, 7 ] },
    bio: 'Backend developer'
  },
  {

```