

# Day - 5 MongoDB Assignment

## 1. Create Collection

```
InsuranceDB> db.createCollection('Policies')  
{ ok: 1 }
```

## 2. Insert

### Insert only one document:

```
db.policies.insertOne({ policy_id: 123, name: "Standard Liability Policy", customer_name: "John Doe", annual_income: 1000000, coverage_amount: 5000000, premium: 500, extensions: { basic: 120, advanced: 150 }, status: "active" }, { policy_id: 124, name: "Extended Coverage Policy", customer_name: "Jane Smith", annual_income: 1500000, coverage_amount: 7000000, premium: 750, extensions: { basic: 150, advanced: 170 }, status: "pending" })
```

### Insert multiple documents

```
db.policies.insertMany([  
  
  { policy_id: 123, name: "Standard Liability Policy", customer_name: "John Doe", annual_income: 1000000, coverage_amount: 5000000, premium: 500, extensions: { basic: 120, advanced: 150 }, status: "active" }, { policy_id: 124, name: "Extended Coverage Policy", customer_name: "Jane Smith", annual_income: 1500000, coverage_amount: 7000000, premium: 750, extensions: { basic: 150, advanced: 170 }, status: "pending" },  
  
  { policy_id: 125, name: "Health Plus Policy", customer_name: "Alice Johnson", annual_income: 931237, coverage_amount: 3539180, premium: 882.19, extensions: { basic: 160.11, advanced: 186.19 }, status: "expired" },  
  
  { policy_id: 126, name: "Standard Liability Policy", customer_name: "Bob Wilson", annual_income: 2143313, coverage_amount: 4277930, premium: 1029.76, extensions: { basic: 188.74, advanced: 246.01 }, status: "active" },  
  
  { policy_id: 127, name: "Homeowners Basic Policy", customer_name: "Carol Davis", annual_income: 2300478, coverage_amount: 9304780, premium: 650.55, extensions: { basic: 184.14, advanced: 126.79 }, status: "expired" },  
  
  { policy_id: 128, name: "Health Plus Policy", customer_name: "David Brown", annual_income: 986014, coverage_amount: 7501939, premium: 461.55, extensions: { basic: 181.7, advanced: 246.98 }, status: "expired" },  
  
  { policy_id: 129, name: "Health Plus Policy", customer_name: "Eve Garcia", annual_income: 1592434, coverage_amount: 5281008, premium: 909.32, extensions: { basic: 126.93, advanced: 142.61 }, status: "active" },
```

```
{
  policy_id: 130, name: "Auto Comprehensive Policy", customer_name: "Frank Miller",
  annual_income: 1937275, coverage_amount: 6318465, premium: 383.18, extensions: { basic: 199.33,
  advanced: 213.74 }, status: "expired" },
}

83.18, extensions: { basic: 199.33, advanced: 213.74 },
...
{
  acknowledged: true,
  insertedIds: {
    '0': ObjectId('6957d5478a734234a71e2621'),
    '1': ObjectId('6957d5478a734234a71e2622'),
    '2': ObjectId('6957d5478a734234a71e2623'),
    '3': ObjectId('6957d5478a734234a71e2624'),
    '4': ObjectId('6957d5478a734234a71e2625'),
    '5': ObjectId('6957d5478a734234a71e2626'),
    '6': ObjectId('6957d5478a734234a71e2627'),
    '7': ObjectId('6957d5478a734234a71e2628')
  }
}
InsuranceDB>
```

### 3.Update

#### Basic Syntax:

db.policies.updateOne({filter}, {update}, {options}) to target one document  
 or db.policies.updateMany({filter}, {update}, {options}) to target multiple documents

#### Update policy 123 status and premium:

```
db.policies.updateOne(
  { policy_id: 123 },
  { $set: { status: "pending" }, $inc: { premium: 50 } }
)
```

```
InsuranceDB> db.policies.updateOne({policy_id:123}, {$set:{status:"Pending"}, $inc:{premium:50}})
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
InsuranceDB> |
```

### Update using upsert for new policy 131:

```
db.policies.updateOne({ policy_id: 131 },{ $set: { status: "active" } },{ upsert: true })
```

```
InsuranceDB> db.policies.updateOne({ policy_id: 131 },{ $set: { status: "active" } },{ upsert: true })
{
  acknowledged: true,
  insertedId: ObjectId('6957d7008f059833e347e9e7'),
  matchedCount: 0,
  modifiedCount: 0,
  upsertedCount: 1
}
InsuranceDB> |
```

### Activate all "pending" policies using updateMany:

```
InsuranceDB> db.policies.updateMany({status: "pending"}, {$set:{status: "active"}})
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
InsuranceDB> |
```

### Add a new field to all the documents:

```
db.policies.updateMany({}, {$set: {updatedAt: new Date()}})
```

```
InsuranceDB> db.policies.updateMany({}, {$set: {updatedAt: new Date()}})
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 9,
  modifiedCount: 9,
  upsertedCount: 0
}
InsuranceDB> |
```

## 4. Projections (Read):

### Show all documents:

```
db.policies.find({})
```

```
InsuranceDB> db.policies.find({})
[ {
  _id: ObjectId('6957d5478a734234a71e2621'),
  policy_id: 123,
  name: 'Standard Liability Policy',
  customer_name: 'John Doe',
  annual_income: 1000000,
  coverage_amount: 5000000,
  premium: 600,
  extensions: { basic: 120, advanced: 150 },
  status: 'Pending'
},
{
  _id: ObjectId('6957d5478a734234a71e2622'),
  policy_id: 124,
  name: 'Extended Coverage Policy',
  customer_name: 'Jane Smith',
  annual_income: 1500000,
  coverage_amount: 7000000,
  premium: 750,
  extensions: { basic: 150, advanced: 170 },
  status: 'active'
},
{
  _id: ObjectId('6957d5478a734234a71e2623'),
  policy_id: 125,
  name: 'Health Plus Policy',
  customer_name: 'Alice Johnson',
  annual_income: 931237,
  coverage_amount: 3539180,
  premium: 882.19,
  extensions: { basic: 160.11, advanced: 186.19 },
  status: 'expired'
},
{
  _id: ObjectId('6957d5478a734234a71e2624'),
  policy_id: 126,
  name: 'Standard Liability Policy',
```

### Show the document with policy\_id:125:

```
db.policies.findOne({policy_id:134})
```

```
InsuranceDB> db.policies.find({policy_id:125})
[ {
  _id: ObjectId('6957d5478a734234a71e2623'),
  policy_id: 125,
  name: 'Health Plus Policy',
  customer_name: 'Alice Johnson',
  annual_income: 931237,
  coverage_amount: 3539180,
  premium: 882.19,
  extensions: { basic: 160.11, advanced: 186.19 },
  status: 'expired'
}
]
InsuranceDB> |
```

### Show the selected fields only using projections:

```
db.policies.find({policy_id:{$gt:126}}, {_id:0, policy_id:1, name:1, customer_name:1, annual_income:1, coverage_amount:1})
```

```
[InsuranceDB> db.policies.find({policy_id:{$gt:126}}, {_id:0, policy_id:1, name:1, customer_name:1, annual_income:1, coverage_amount:1})
[
  {
    policy_id: 127,
    name: 'Homeowners Basic Policy',
    customer_name: 'Carol Davis',
    annual_income: 2380478,
    coverage_amount: 9304780
  },
  {
    policy_id: 128,
    name: 'Health Plus Policy',
    customer_name: 'David Brown',
    annual_income: 986014,
    coverage_amount: 7501939
  },
  {
    policy_id: 129,
    name: 'Health Plus Policy',
    customer_name: 'Eve Garcia',
    annual_income: 1592434,
    coverage_amount: 5281008
  },
  {
    policy_id: 130,
    name: 'Auto Comprehensive Policy',
    customer_name: 'Frank Miller',
    annual_income: 1937275,
    coverage_amount: 6318465
  },
  { policy_id: 131 }
]
InsuranceDB> |
```

### Show the documents in a sorted order of premium in descending order:

```
db.policies.find({status: "active"}).sort({premium: -1})
```

```
[InsuranceDB> db.policies.find({status: "active"}).sort({premium: -1})
[
  {
    _id: ObjectId('6957d5478a734234a71e2624'),
    policy_id: 126,
    name: 'Standard Liability Policy',
    customer_name: 'Bob Wilson',
    annual_income: 2143313,
    coverage_amount: 4277930,
    premium: 1029.76,
    extensions: { basic: 188.74, advanced: 246.01 },
    status: 'active'
  },
  {
    _id: ObjectId('6957d5478a734234a71e2627'),
    policy_id: 129,
    name: 'Health Plus Policy',
    customer_name: 'Eve Garcia',
    annual_income: 1592434,
    coverage_amount: 5281008,
    premium: 909.32,
    extensions: { basic: 126.93, advanced: 142.61 },
    status: 'active'
  },
  {
    _id: ObjectId('6957d5478a734234a71e2622'),
    policy_id: 124,
    name: 'Extended Coverage Policy',
    customer_name: 'Jane Smith',
    annual_income: 1500000,
    coverage_amount: 7000000,
    premium: 750,
    extensions: { basic: 150, advanced: 170 },
    status: 'active'
  },
]
```

### Show the documents in a sorted order of premium in ascending order:

```
db.policies.find({status: "active"}).sort({premium: 1})
```

```
InsuranceDB> db.policies.find({status: "active"}).sort({premium: 1})
[
  {
    _id: ObjectId('6957d7008f059833e347e9e7'),
    policy_id: 131,
    status: 'active'
  },
  {
    _id: ObjectId('6957d5478a734234a71e2622'),
    policy_id: 124,
    name: 'Extended Coverage Policy',
    customer_name: 'Jane Smith',
    annual_income: 1500000,
    coverage_amount: 7000000,
    premium: 750,
    extensions: { basic: 150, advanced: 170 },
    status: 'active'
  },
  {
    _id: ObjectId('6957d5478a734234a71e2627'),
    policy_id: 129,
    name: 'Health Plus Policy',
    customer_name: 'Eve Garcia',
    annual_income: 1592434,
    coverage_amount: 5281008,
    premium: 909.32,
    extensions: { basic: 126.93, advanced: 142.61 },
    status: 'active'
  },
  {
    _id: ObjectId('6957d5478a734234a71e2624'),
    policy_id: 126,
    name: 'Standard Liability Policy',
    customer_name: 'Bob Wilson',
    annual_income: 2143313,
    coverage_amount: 4277930,
    premium: 1029.76,
    extensions: { basic: 188.74, advanced: 246.01 },
    status: 'active'
  }
]
```

### Show only first 3 documents:

```
db.policies.find().limit(3).pretty()
```

```
InsuranceDB> db.policies.find().limit(3).pretty()
[
  {
    _id: ObjectId('6957d5478a734234a71e2621'),
    policy_id: 123,
    name: 'Standard Liability Policy',
    customer_name: 'John Doe',
    annual_income: 1000000,
    coverage_amount: 5000000,
    premium: 600,
    extensions: { basic: 120, advanced: 150 },
    status: 'Pending'
  },
  {
    _id: ObjectId('6957d5478a734234a71e2622'),
    policy_id: 124,
    name: 'Extended Coverage Policy',
    customer_name: 'Jane Smith',
    annual_income: 1500000,
    coverage_amount: 7000000,
    premium: 750,
    extensions: { basic: 150, advanced: 170 },
    status: 'active'
  },
  {
    _id: ObjectId('6957d5478a734234a71e2623'),
    policy_id: 125,
    name: 'Health Plus Policy',
    customer_name: 'Alice Johnson',
    annual_income: 931237,
    coverage_amount: 3539180,
    premium: 882.19,
    extensions: { basic: 160.11, advanced: 186.19 },
    status: 'expired'
  }
]
InsuranceDB> |
```

## 5. Aggregations:

### Average premium by status:

```
db.policies.aggregate([{"$group": {"_id": "$status", "avgPremium": {"$avg": "$premium" }}}])
```

```
InsuranceDB> db.policies.aggregate([{"$group": {"_id": "$status", "avgPremium": {"$avg": "$premium" }}}])
[{"_id": "expired", "avgPremium": 594.3675000000001}, {"_id": "Pending", "avgPremium": 600}, {"_id": "active", "avgPremium": 896.36}]
InsuranceDB> |
```

### Current total policies:

```
db.policies.aggregate([{"$count": "total" }])
```

```
InsuranceDB> db.policies.aggregate([{"$count": "total" }])
[{"total": 9}]
InsuranceDB> |
```

### Group by status with counts:

```
db.policies.aggregate([{"$group": {"_id": "$status", "count": {"$sum": 1 }}}])
```

```
InsuranceDB> db.policies.aggregate([{"$group": {"_id": "$status", "count": {"$sum": 1 }}}])
[{"_id": "expired", "count": 4}, {"_id": "Pending", "count": 1}, {"_id": "active", "count": 4}]
InsuranceDB> |
```

### Filter active, then total premium:

```
db.policies.aggregate([{"$match": {"status": "active"}}, {"$group": {"_id": null, "totalPremium": {"$sum": "$premium" }}}])
```

```
InsuranceDB> db.policies.aggregate([{"$match": {"status": "active"}}, {"$group": {"_id": null, "totalPremium": {"$sum": "$premium" }}}])
[{"_id": null, "totalPremium": 2689.08}]
InsuranceDB> |
```

### Add coverage ratios to all policies:

```
db.policies.aggregate([{"$addFields": {"coverageRatio": {"$divide": ["$coverage_amount", "$annual_income"]}}}], {"pretty": true})
```

```
InsuranceDB> db.policies.aggregate([{$addFields:{coverageRatio:{$divide:[ "$coverage_amount", "$annual_income"]}}}]).pretty()
[
  {
    _id: ObjectId('6957d5478a734234a71e2621'),
    policy_id: 123,
    name: 'Standard Liability Policy',
    customer_name: 'John Doe',
    annual_income: 1000000,
    coverage_amount: 5000000,
    premium: 600,
    extensions: { basic: 120, advanced: 150 },
    status: 'Pending',
    coverageRatio: null
  },
  {
    _id: ObjectId('6957d5478a734234a71e2622'),
    policy_id: 124,
    name: 'Extended Coverage Policy',
    customer_name: 'Jane Smith',
    annual_income: 1500000,
    coverage_amount: 7000000,
    premium: 750,
    extensions: { basic: 150, advanced: 170 },
    status: 'active',
    coverageRatio: 4.6666666666666667
  },
  {
    _id: ObjectId('6957d5478a734234a71e2623'),
    policy_id: 125,
    name: 'Health Plus Policy',
    customer_name: 'Alice Johnson',
    annual_income: 931237,
    coverage_amount: 3539180,
    premium: 882.19,
    status: 'active'
  }
]
```

## 6. Logical Operators

**Active or pending, high income:**

```
db.policies.find({ $or: [ {status: "active"}, {status: "pending"} ], annual_income: { $gt: 1500000 } }).pretty()
```

```
InsuranceDB> db.policies.find({ $or: [ {status: "active"}, {status: "pending"} ], annual_income: { $gt: 1500000 } }).pretty()
[
  {
    _id: ObjectId('6957d5478a734234a71e2624'),
    policy_id: 126,
    name: 'Standard Liability Policy',
    customer_name: 'Bob Wilson',
    annual_income: 2143313,
    coverage_amount: 4277930,
    premium: 1029.76,
    extensions: { basic: 188.74, advanced: 246.01 },
    status: 'active',
    updatedAt: ISODate('2026-01-02T14:59:15.125Z')
  },
  {
    _id: ObjectId('6957d5478a734234a71e2627'),
    policy_id: 129,
    name: 'Health Plus Policy',
    customer_name: 'Eve Garcia',
    annual_income: 1592434,
    coverage_amount: 5281008,
    premium: 909.32,
    extensions: { basic: 126.93, advanced: 142.61 },
    status: 'active',
    updatedAt: ISODate('2026-01-02T14:59:15.125Z')
  }
]
```

### Expired AND low premium (under 600):

```
db.policies.find({ $and: [ {status: "expired"}, {premium: { $lt: 600 }} ] }).pretty()
```

```
InsuranceDB> db.policies.find({ $and: [ {status: "expired"}, {premium: { $lt: 600 }} ] }).pretty()
[
  {
    _id: ObjectId('6957d5478a734234a71e2626'),
    policy_id: 128,
    name: 'Health Plus Policy',
    customer_name: 'David Brown',
    annual_income: 986014,
    coverage_amount: 7501939,
    premium: 461.55,
    extensions: { basic: 181.7, advanced: 246.98 },
    status: 'expired',
    updatedAt: ISODate('2026-01-02T14:59:15.125Z')
  },
  {
    _id: ObjectId('6957d5478a734234a71e2628'),
    policy_id: 130,
    name: 'Auto Comprehensive Policy',
    customer_name: 'Frank Miller',
    annual_income: 1937275,
    coverage_amount: 6318465,
    premium: 383.18,
    extensions: { basic: 199.33, advanced: 213.74 },
    status: 'expired',
    updatedAt: ISODate('2026-01-02T14:59:15.125Z')
  }
]
InsuranceDB> |
```

### NOR: not active and not high coverage (>5M):

```
db.policies.find({ $nor: [ {status: "active"}, {coverage_amount: { $gt: 5000000 }} ] }).pretty()
```

```
InsuranceDB> db.policies.find({ $nor: [ {status: "active"}, {coverage_amount: { $gt: 5000000 }} ] }).pretty()
[
  {
    _id: ObjectId('6957d5478a734234a71e2621'),
    policy_id: 123,
    name: 'Standard Liability Policy',
    customer_name: 'John Doe',
    annual_income: 1000000,
    coverage_amount: 5000000,
    premium: 600,
    extensions: { basic: 120, advanced: 150 },
    status: 'Pending',
    updatedAt: ISODate('2026-01-02T14:59:15.125Z')
  },
  {
    _id: ObjectId('6957d5478a734234a71e2623'),
    policy_id: 125,
    name: 'Health Plus Policy',
    customer_name: 'Alice Johnson',
    annual_income: 931237,
    coverage_amount: 3539180,
    premium: 882.19,
    extensions: { basic: 160.11, advanced: 186.19 },
    status: 'expired',
    updatedAt: ISODate('2026-01-02T14:59:15.125Z')
  }
]
InsuranceDB> |
```

### Active high premium avg:

```
db.policies.aggregate([{$match: { $and: [ {status: "active"}, {premium: { $gt: 700 }} ] }}, {$group: { _id: null, avgPremium: { $avg: "$premium" } }}])
```

```
InsuranceDB> db.policies.aggregate([
...   { $match: { $and: [ {status: "active"}, {premium: { $gt: 700 }} ] } },
...   { $group: { _id: null, avgPremium: { $avg: "$premium" } } }
... ]
...
[ { _id: null, avgPremium: 896.36 } ]
InsuranceDB> |
```

### Lookup policies with same name (e.g., duplicates):

```
db.policies.aggregate([{$lookup:{from:"policies",localField:"name",foreignField:"name",as:"similarPolicies"}},{$limit:2}]).pretty()
```

```
InsuranceDB> db.policies.aggregate([{$lookup:{from:"policies",localField:"name",foreignField:"name",as:"similarPolicies"}},{$limit:2}]).pretty()
[
  {
    _id: ObjectId('6957d5478a734234a71e2621'),
    policy_id: 123,
    name: 'Standard Liability Policy',
    customer_name: 'John Doe',
    annual_income: 1000000,
    coverage_amount: 5000000,
    premium: 600,
    extensions: { basic: 120, advanced: 150 },
    status: 'Pending',
    updatedAt: ISODate('2026-01-02T14:59:15.125Z'),
    similarPolicies: [
      {
        _id: ObjectId('6957d5478a734234a71e2621'),
        policy_id: 123,
        name: 'Standard Liability Policy',
        customer_name: 'John Doe',
        annual_income: 1000000,
        coverage_amount: 5000000,
        premium: 600,
        extensions: { basic: 120, advanced: 150 },
        status: 'Pending',
        updatedAt: ISODate('2026-01-02T14:59:15.125Z')
      },
      {
        _id: ObjectId('6957d5478a734234a71e2624'),
        policy_id: 126,
        name: 'Standard Liability Policy',
        customer_name: 'Bob Wilson',
        annual_income: 2143313,
        coverage_amount: 4277930,
        premium: 1029.76,
        extensions: { basic: 188.74, advanced: 246.01 },
        status: 'active',
        updatedAt: ISODate('2026-01-02T14:59:15.125Z')
      }
    ]
  }
]
```

## 7. Delete

### Delete first expired policy:

```
db.policies.deleteOne({status: "expired"})
```

```
]
InsuranceDB> db.policies.deleteOne({status: "expired"})
{ acknowledged: true, deletedCount: 1 }
InsuranceDB> |
```

**Delete specific ID:**

```
db.policies.deleteOne({policy_id: 130})
```

```
InsuranceDB> db.policies.deleteOne({policy_id: 130})
{ acknowledged: true, deletedCount: 1 }
InsuranceDB> |
```

**Return deleted doc:**

```
db.policies.findOneAndDelete({status: "pending"})
```

```
InsuranceDB> db.policies.findOneAndDelete({status: "pending"})
null
InsuranceDB> |
```

**Delete all expired:**

```
db.policies.deleteMany({status: "expired"})
```

```
InsuranceDB> db.policies.deleteMany({status: "expired"})
{ acknowledged: true, deletedCount: 2 }
InsuranceDB> |
```

**Empty the collection:**

```
db.policies.deleteMany({})
```

```
InsuranceDB> db.policies.deleteMany({})
{ acknowledged: true, deletedCount: 5 }
InsuranceDB> |
```