Sample Car Data

Single Document

```json
{
 "maker": "Tata",
 "model": "Nexon",
 "fuel_type": "Petrol",
 "transmission": "Automatic",
 "engine": {
      "type": "Turbocharged",
      "cc": 1199,
      "torque": "170 Nm"
 },
 "features": [
      "Touchscreen",
      "Reverse Camera",
      "Bluetooth Connectivity"
 ],
 "sunroof": false,
 "airbags": 2
 }
```

Many Document [{}, {}, {}]

```json
[
 {
 "maker": "Hyundai",
 "model": "Creta",
 "fuel_type": "Diesel",
 "transmission": "Manual",
 "engine": {
 "type": "Naturally Aspirated",
 "cc": 1493,
 "torque": "250 Nm"
 },
 "features": [
 "Sunroof",
 "Leather Seats",
 "Wireless Charging",
 "Ventilated Seats",
 "Bluetooth"
```

```json
  ],
  "sunroof": true,
  "airbags": 6
},
{
  "maker": "Maruti Suzuki",
  "model": "Baleno",
  "fuel_type": "Petrol",
  "transmission": "Automatic",
  "engine": {
    "type": "Naturally Aspirated",
    "cc": 1197,
    "torque": "113 Nm"
  },
  "features": [
    "Projector Headlamps",
    "Apple CarPlay",
    "ABS"
  ],
  "sunroof": false,
  "airbags": 2
},
{
  "maker": "Mahindra",
  "model": "XUV500",
  "fuel_type": "Diesel",
  "transmission": "Manual",
  "engine": {
    "type": "Turbocharged",
    "cc": 2179,
    "torque": "360 Nm"
  },
  "features": [
    "All-Wheel Drive",
    "Navigation System",
    "Cruise Control"
  ],
  "sunroof": true,
  "airbags": 6
},
{
  "maker": "Honda",
  "model": "City",
  "fuel_type": "Petrol",
  "transmission": "Automatic",
```

```json
    "transmission": "Automatic",
    "engine": {
    "type": "Naturally Aspirated",
    "cc": 1498,
    "torque": "145 Nm"
    },
    "features": [
    "Keyless Entry",
    "Auto AC",
    "Multi-angle Rearview Camera"
    ],
    "sunroof": false,
    "airbags": 4
    }
]
```

Data for Relationship

users collection

```json
[
  {
    "_id": "user1",
    "name": "Amit Sharma",
    "email": "amit.sharma@example.com",
    "phone": "+91-987654210",
    "address": "MG Road, Mumbai, Maharashtra"
  },
  {
    "_id": "user2",
    "name": "Priya Verma",
    "email": "priya.verma@example.com",
    "phone": "+91-987654211",
    "address": "Nehru Place, New Delhi, Delhi"
  },
  {
    "_id": "user3",
    "name": "Rahul Singh",
    "email": "rahul.singh@example.com",
    "phone": "+91-987654212",
    "address": "Sector 18, Noida, Uttar Pradesh"
  },
```

```
  },
  {
    "_id": "user4",
    "name": "Anjali Nair",
    "email": "anjali.nair@example.com",
    "phone": "+91-987654213",
    "address": "Marine Drive, Kochi, Kerala"
  },
  {
    "_id": "user5",
    "name": "Vikram Desai",
    "email": "vikram.desai@example.com",
    "phone": "+91-987654214",
    "address": "Park Street, Kolkata, West Bengal"
  }
]
```

orders collection

```
[
  {
    "_id": "order1",
    "user_id": "user1",
    "product": "Laptop",
    "amount": 50000,
    "order_date": "2024-08-01"
  },
  {
    "_id": "order2",
    "user_id": "user2",
    "product": "Mobile Phone",
    "amount": 15000,
    "order_date": "2024-08-05"
  },
  {
    "_id": "order3",
    "user_id": "user1",
    "product": "Headphones",
    "amount": 2000,
    "order_date": "2024-08-10"
  },
  {
    "_id": "order4",
```

    "user_id": "user3",
    "product": "Tablet",
    "amount": 25000,
    "order_date": "2024-08-12"
  },
  {
    "_id": "order5",
    "user_id": "user4",
    "product": "Smart Watch",
    "amount": 8000,
    "order_date": "2024-08-15"
  }
]

Data for Aggregate Framework

[{"maker":"Hyundai","model":"Creta","fuel_type":"Diesel","transmission":"Manual","engine":
{"type":"Naturally Aspirated","cc":1493,"torque":"250 Nm"},"features":["Sunroof","Leather
Seats","Wireless Charging","Ventilated
Seats","Bluetooth"],"sunroof":true,"airbags":6,"price":1500000,"owners":
[{"name":"Raju","purchase_date":"2021-03-15","location":"Mumbai"},
{"name":"Shyam","purchase_date":"2023-01-10","location":"Delhi"}],"service_history":[{"date":"2022-
04-10","service_type":"Oil Change","cost":5000},{"date":"2023-07-18","service_type":"Brake
Replacement","cost":12000}]},{"maker":"Maruti
Suzuki","model":"Baleno","fuel_type":"Petrol","transmission":"Automatic","engine":{"type":"Naturally
Aspirated","cc":1197,"torque":"113 Nm"},"features":["Projector Headlamps","Apple
CarPlay","ABS"],"sunroof":false,"airbags":2,"price":800000,"owners":
[{"name":"Baburao","purchase_date":"2020-08-22","location":"Pune"}],"service_history":
[{"date":"2021-05-12","service_type":"Tire Rotation","cost":2000},{"date":"2022-11-
05","service_type":"Battery Replacement","cost":7000}]},
{"maker":"Mahindra","model":"XUV500","fuel_type":"Diesel","transmission":"Manual","engine":
{"type":"Turbocharged","cc":2179,"torque":"360 Nm"},"features":["All-Wheel Drive","Navigation
System","Cruise Control"],"sunroof":true,"airbags":6,"price":1800000,"owners":
[{"name":"Raju","purchase_date":"2019-11-30","location":"Bangalore"},
{"name":"Shyam","purchase_date":"2022-02-15","location":"Hyderabad"}],"service_history":
[{"date":"2021-02-25","service_type":"Transmission Repair","cost":35000},{"date":"2023-03-
10","service_type":"Tire Replacement","cost":15000}]},
{"maker":"Honda","model":"City","fuel_type":"Petrol","transmission":"Automatic","engine":
{"type":"Naturally Aspirated","cc":1498,"torque":"145 Nm"},"features":["Keyless Entry","Auto
AC","Multi-angle Rearview Camera"],"sunroof":false,"airbags":4,"price":1200000,"owners":
[{"name":"Baburao","purchase_date":"2020-05-20","location":"Chennai"}],"service_history":
[{"date":"2021-08-10","service_type":"Oil Change","cost":5000},{"date":"2022-10-
25","service_type":"Brake Replacement","cost":10000}]},
{"maker":"Tata","model":"Nexon","fuel_type":"Petrol","transmission":"Automatic","engine":

{"type":"Turbocharged","cc":1199,"torque":"170 Nm"},"features":["Touchscreen","Reverse Camera","Bluetooth Connectivity"],"sunroof":false,"airbags":2,"price":1100000,"owners": [{"name":"Raju","purchase_date":"2021-12-05","location":"Kolkata"}],"service_history":[{"date":"2022-12-01","service_type":"Oil Change","cost":6000},{"date":"2023-06-15","service_type":"Tire Rotation","cost":3000}]},

{"maker":"Hyundai","model":"Venue","fuel_type":"Petrol","transmission":"Automatic","engine": {"type":"Turbocharged","cc":998,"torque":"172 Nm"},"features":["Sunroof","Touchscreen Infotainment","Keyless Entry","Rear Camera","Cruise Control"],"sunroof":true,"airbags":4,"price":1200000,"owners": [{"name":"Amit","purchase_date":"2020-05-20","location":"Bangalore"}, {"name":"Priya","purchase_date":"2022-11-05","location":"Chennai"}],"service_history": [{"date":"2021-07-15","service_type":"Oil Change","cost":4000},{"date":"2023-03-22","service_type":"Tire Replacement","cost":8000}]},

{"maker":"Hyundai","model":"i20","fuel_type":"Petrol","transmission":"Manual","engine": {"type":"Naturally Aspirated","cc":1197,"torque":"114 Nm"},"features":["Apple CarPlay","ABS","Projector Headlamps","Wireless Charging"],"sunroof":false,"airbags":2,"price":900000,"owners": [{"name":"Rohit","purchase_date":"2021-06-15","location":"Delhi"}],"service_history":[{"date":"2022-09-10","service_type":"Battery Replacement","cost":7000},{"date":"2023-05-25","service_type":"Tire Rotation","cost":2500}]},{"maker":"Maruti Suzuki","model":"Swift","fuel_type":"Petrol","transmission":"Manual","engine":{"type":"Naturally Aspirated","cc":1198,"torque":"113 Nm"},"features":["Touchscreen Infotainment","ABS","Keyless Entry","Rear Parking Sensors"],"sunroof":false,"airbags":2,"price":750000,"owners": [{"name":"Vijay","purchase_date":"2019-03-20","location":"Hyderabad"}],"service_history": [{"date":"2020-05-18","service_type":"Oil Change","cost":3000},{"date":"2022-08-10","service_type":"Brake Replacement","cost":5000}]},

{"maker":"Tata","model":"Harrier","fuel_type":"Diesel","transmission":"Automatic","engine": {"type":"Turbocharged","cc":1956,"torque":"350 Nm"},"features":["Panoramic Sunroof","Leather Upholstery","Terrain Response System","Auto-Dimming IRVM"],"sunroof":true,"airbags":6,"price":2000000,"owners": [{"name":"Deepak","purchase_date":"2022-01-10","location":"Mumbai"}],"service_history": [{"date":"2022-10-15","service_type":"Transmission Repair","cost":45000},{"date":"2023-04-20","service_type":"Brake Replacement","cost":15000}]},

{"maker":"Honda","model":"Amaze","fuel_type":"Diesel","transmission":"Manual","engine": {"type":"Naturally Aspirated","cc":1498,"torque":"200 Nm"},"features":["Keyless Entry","Auto AC","Rear Parking Camera","Cruise Control"],"sunroof":false,"airbags":4,"price":1000000,"owners": [{"name":"Anil","purchase_date":"2020-11-25","location":"Kolkata"}],"service_history":[{"date":"2021-12-10","service_type":"Oil Change","cost":4500},{"date":"2022-08-15","service_type":"Tire Rotation","cost":2500}]},{"maker":"Tata","model":"Nexon EV","fuel_type":"Electric","transmission":"Automatic","engine":{"type":"Electric Motor","battery_capacity":"30.2 kWh","torque":"245 Nm"},"features":["Touchscreen Infotainment","Wireless Charging","Connected Car Tech","Sunroof"],"sunroof":true,"airbags":6,"price":1400000,"owners": [{"name":"Vikas","purchase_date":"2021-05-20","location":"Bangalore"}],"service_history": [{"date":"2022-06-10","service_type":"Battery Check","cost":0},{"date":"2023-03-15","service_type":"Tire Rotation","cost":3000}]},{"maker":"Hyundai","model":"Kona

Electric","fuel_type":"Electric","transmission":"Automatic","engine":{"type":"Electric Motor","battery_capacity":"39.2 kWh","torque":"395 Nm"},"features":["Wireless Charging","Ventilated Seats","Sunroof","Auto AC"],"sunroof":true,"airbags":6,"price":2300000,"owners": [{"name":"Sneha","purchase_date":"2022-01-15","location":"Mumbai"}],"service_history": [{"date":"2022-09-10","service_type":"Battery Check","cost":0},{"date":"2023-06-05","service_type":"Brake Replacement","cost":8000}]},{"maker":"Maruti Suzuki","model":"WagonR","fuel_type":"CNG","transmission":"Manual","engine":{"type":"Naturally Aspirated","cc":998,"torque":"90 Nm"},"features":["Manual AC","ABS","Power Windows"],"sunroof":false,"airbags":2,"price":600000,"owners": [{"name":"Rahul","purchase_date":"2019-07-22","location":"Delhi"}],"service_history":[{"date":"2020-11-10","service_type":"CNG Kit Checkup","cost":2000},{"date":"2021-08-15","service_type":"Tire Rotation","cost":1500}]}, {"maker":"Honda","model":"Amaze","fuel_type":"CNG","transmission":"Manual","engine": {"type":"Naturally Aspirated","cc":1199,"torque":"110 Nm"},"features":["Keyless Entry","Auto AC","Rear Parking Camera","Cruise Control"],"sunroof":false,"airbags":4,"price":800000,"owners": [{"name":"Sanjay","purchase_date":"2021-03-18","location":"Pune"}],"service_history":[{"date":"2021-09-10","service_type":"CNG Kit Checkup","cost":2500},{"date":"2022-05-15","service_type":"Oil Change","cost":3500}]}]

Python Program

```python
from pymongo import MongoClient

# Replace with your MongoDB connection string
client = MongoClient('mongodb://localhost:27017/')


db = client.todo_db  # Create or connect to a database named "todo_db"
tasks_collection = db.tasks  # Create or connect to a collection named "tasks"


def create_task(description):
    task = {
        'description': description
    }
    result = tasks_collection.insert_one(task)
    print(f'Task created with id: {result.inserted_id}')

def read_tasks():
```

```python
    tasks = tasks_collection.find()
    print("\nYour To-Do List:")
    for task in tasks:
        print(f"- {task['description']}")


while True:
    print("\n1. Create Task")
    print("2. View Tasks")
    print("3. Exit")

    choice = input("Enter your choice: ")

    if choice == '1':
        description = input("Enter task description: ")
        create_task(description)
    elif choice == '2':
        read_tasks()
    elif choice == '3':
        break
    else:
        print("Invalid choice. Please try again.")
```

Queries Used in Video

```javascript
db.cars.aggregate([
  {$group: {
    _id: "$fuel_type",
    TotalCars: {$sum: 1
      }
    }
  }
])

db.cars.aggregate([
  {$match: {
    maker: "Hyundai"
    }
  },
  {$project: {
    _id: 0,
    maker: 1,
    model: 1,
```

```
      fuel_type: 1
    }
  },
  {$sort: {model: 1
    }
  }
])

db.cars.aggregate([
  {$sortByCount: "$maker"
  }
])

db.cars.aggregate([
  {$match: {maker: "Hyundai"
    }
  },
  {$project: {
    _id: 0,
    Car_Name: {$toUpper: {$concat: [
          "$maker",
          " ",
          "$model"
        ]
      }
    }
  },
  {$out: "hyundai_cars"
  }
])

db.cars.aggregate([
  {$project: {
    _id: 0,
    model: 1,
    is_diesel: {
      $regexMatch: {
        input: "$fuel_type",
        regex: "Dies"
      }
    }
  }
  }
])
```

```
db.cars.aggregate([
  {$project: {
    _id: 0,
    model: 1,
    price: 1
    }
  },
  {$addFields: {
    price_in_lakhs: {
      $round: [
        {$divide: [
          "$price",
          90000
          ]
        },
        1
        ]
      }
    }
  }
])

db.cars.aggregate([
  { $match: { maker: "Hyundai"
    }
  },
  { $set: {
    total_service_cost: {
      $sum: "$service_history.cost"
      }
    }
  },
  { $project: {
    _id: 0,
    model: 1,
    total_service_cost: 1
    }
  }
])

db.cars.aggregate([
  {$project: {
    _id: 0,
    maker: 1,
    model: 1,
```

```
    fuel_cat: {
      $cond: {
        if: {$eq: [
              "$fuel_type",
              "Petrol"
           ]
         },
          then: "Petrol Car",
        else: "Non_petrol Car"
        }
      }
    }
  }
])

db.cars.aggregate([
  {$project: {
    _id: 0,
    maker: 1,
    model: 1,
    budget_cat: {
      $switch: {
        branches: [
            { //If car is less than 5 Lakhs
            case: {$lt: [
                  "$price",
                  500000
                ]
              },
              then: "Budget"
            },
            {
              //Car price range between 5-10 lakhs
            case: {$and: [
                  {$gte: [
                      "$price",
                      500000
                    ]
                  },
                  {$lt: [
                      "$price",
                      1000000
                    ]
                  }
                ]
```

```
                },
                then: "Mid-Range"
            },
            {
                case: {$gte: [
                        "$price",
                        1000000
                    ]
                },
                then: "Premium"
            }
        ],
        default: "Unknown"
        }
    }
}
])

db.cars.aggregate(
        {$project:
        {
        _id: 0,
        model: 1,
        date: "$$NOW"
    }
})

db.users.aggregate([
    {$lookup:{
        from:"orders",
        localField:"_id",
        foreignField:"user_id",
        as: "orders"
    }}
])

db.createCollection("users3", {
    validator: {
        $jsonSchema: {
            bsonType: "object",
            required: ["name", "phone"],
            properties:{
                name:{
                    bsonType: "string",
                    description: "Name should be string"
```

```
        }
      }
    }
  },
  validationLevel: "strict",
  validationAction: "error"
})

db.users.find().count()
db.users.find({name: 'Anthony Hurst'})
db.movies.find({title: 'The Ace of Hearts'}).explain("executionStats")
db.users.createIndex({ name: 1 })
db.users.dropIndex("name")
```