University of Colombo School of Computing

SCS 2209- Database II

Labsheet 07

1. Exercise 01

```
test> use Company
switched to db Company
Company> db.createCollection('Employees')
{ ok: 1 }
```

```
{ ok: 1 }
Company> db.Employees.insertOne({
...     _id: 1,
...     Name: "John Doe",
...     Age: 28,
...     Department: "IT",
...     Salary: 60000
... })
{ acknowledged: true, insertedId: 1 }
Company>

Company> db.Employees.insertOne({
...     _id: 2,
...     Name: "Alice Johnson",
...     Age: 32,
...     Department: "HR",
...     Salary: 75000
... })
{ acknowledged: true, insertedId: 2 }
Company>

Company> db.Employees.insertOne({
...     _id: 3,
...     Name: "Bob Smith",
...     Age: 25,
...     Department: "Marketing",
...     Salary: 50000
... })
{ acknowledged: true, insertedId: 3 }
```

```
{ acknowledged: true, insertedId: 3 }
Company> db.Employees.find()
[
  {
    _id: 1,
    Name: 'John Doe',
    Age: 28,
    Department: 'IT',
    Salary: 60000
  },
  {
    _id: 2,
    Name: 'Alice Johnson',
    Age: 32,
    Department: 'HR',
    Salary: 75000
  },
  {
    _id: 3,
    Name: 'Bob Smith',
    Age: 25,
    Department: 'Marketing',
    Salary: 50000
  }
]
Company>
```

```
]
Company> db.Employees.find({}, { Name: 1, Age: 1, _id: 0 })
[
  { Name: 'John Doe', Age: 28 },
  { Name: 'Alice Johnson', Age: 32 },
  { Name: 'Bob Smith', Age: 25 }
]
Company>
```

```
Company> db.Employees.updateOne({name:"John Doe"},{$set:{Age:30}})
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
```

```
Company> db.Employees.updateMany({}, { $set: { position: "Employee" } })
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 10,
  modifiedCount: 10,
  upsertedCount: 0
}
```

```
Company> db.Employees.deleteOne({name:"Alic Johnson"})
{ acknowledged: true, deletedCount: 0 }
Company> db.Employees.drop()
true
Company>
```

```
Company> db.Employees.aggregate([ { $group: { _id: "$department", totalEmployees: { $sum: 1 } } }] )
```

```
Company> db.Employees.aggregate([ { $group: { _id: null, averageAge: { $avg: "$age" } } }] )
```

2. Exercise 02

```
test> use ecommerce
switched to db ecommerce
ecommerce> db.createCollection("products")
{ ok: 1 }
ecommerce> db.products.insertMany([
...   { Product: "Laptop", Category: "Electronics", Price: 899.99, Quantity: 20 },
...   { Product: "Smartphone", Category: "Electronics", Price: 599.99, Quantity: 30 },
...   { Product: "Headphones", Category: "Electronics", Price: 129.99, Quantity: 50 },
...   { Product: "T-shirt", Category: "Clothing", Price: 19.99, Quantity: 100 },
...   { Product: "Jeans", Category: "Clothing", Price: 49.99, Quantity: 80 },
...   { Product: "Backpack", Category: "Accessories", Price: 39.99, Quantity: 40 },
...   { Product: "Watch", Category: "Accessories", Price: 129.99, Quantity: 25 },
...   { Product: "Gaming Console", Category: "Electronics", Price: 299.99, Quantity: 15 }
... ])
{
  acknowledged: true,
  insertedIds: {
    '0': ObjectId("65a6167ff4081544ea9490e1"),
    '1': ObjectId("65a6167ff4081544ea9490e2"),
    '2': ObjectId("65a6167ff4081544ea9490e3"),
    '3': ObjectId("65a6167ff4081544ea9490e4"),
    '4': ObjectId("65a6167ff4081544ea9490e5"),
    '5': ObjectId("65a6167ff4081544ea9490e6"),
    '6': ObjectId("65a6167ff4081544ea9490e7"),
    '7': ObjectId("65a6167ff4081544ea9490e8")
  }
}
```

```
ecommerce> db.products.aggregate([
...   { $group: { _id: null, averageQuantity: { $avg: "$Quantity" } } }
... ])
[ { _id: null, averageQuantity: 45 } ]
...   { $group: { _id: "$Category", averagePrice: { $avg: "$Price" } } }
... ])
[
  { _id: 'Electronics', averagePrice: 482.49 },
  { _id: 'Clothing', averagePrice: 34.99 },
  { _id: 'Accessories', averagePrice: 84.99000000000001 }
]
ecommerce> db.products.updateMany({ Category: "Clothing" }, { $set: { Quantity: 50 }, $mul: { Price: 1.05 } })
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 2,
  modifiedCount: 2,
  upsertedCount: 0
}
ecommerce> var avgQuantity = db.products.aggregate([{ $group: { _id: null, avgQuantity: { $avg: "$Quantity" } } }]).toAr
ray()[0].avgQuantity;
```

```
]
ecommerce> db.products.deleteMany({ Price: { $lt: 30 } })
{ acknowledged: true, deletedCount: 1 }
```

3. Activity 3

```
test> use school
switched to db school
school> db.createCollection("students")
{ ok: 1 }
school> db.school.insertMany([{Name:"Alic",Age:20,Grade:85},{Name:"Bob",Age:22,Grade:92}])
{
  acknowledged: true,
  insertedIds: {
    '0': ObjectId("65a617ef6c3c2b7f4cf04896"),
    '1': ObjectId("65a617ef6c3c2b7f4cf04897")
  }
}
school> db.students.aggregate([
```

```
school> db.students.aggregate([
...   { $group: { _id: "$Age", averageGrade: { $avg: "$Grade" } } }
... ])
```

```
ecommerce> db.products.aggregate([ { $group: { _id: "$Category", averageQuantity: { $avg: "$Quantity" }, averagePrice: {
 $avg: "$Price" } } }] )
```

```
school> db.students.updateMany({ Age: { $lt: 22 } }, { $inc: { Grade: 5 } })
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 0,
  modifiedCount: 0,
  upsertedCount: 0
}
```

```
school> db.students.deleteMany({ Age: { $lt: 21 } })
{ acknowledged: true, deletedCount: 0 }
```

```
school> db.students.aggregate([ { $project: { _id: 0, Name: 1, Age: 1, Grade: 1, GradeRange: { $switch: { branches: [ {
case: { $gte: ["$Grade", 90] }, then: "A" }, { case: { $gte: ["$Grade", 80] }, then: "B" } ], default: "C"  } } } }, { $
group: { _id: "$GradeRange", averageAge: { $avg: "$Age" }, averageGrade: { $avg: "$Grade" } } }] )
```