National Institute of Technology Meghalaya

Assignment No: 06

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Programme: Master of Technology

Department: Computer Science & Engineering

Semester: 01

Course Name: ADVANCED DBMS LAB

Course Code: CS553

```
import pymongo

client=pymongo.MongoClient("mongodb+srv://subhasishduttashuvo2018:shuvo634@cluster0.uwil4if.mongodb.net/?retryWrites=true&w=majority")



# Question No : -01
# 1. Design a MongoDB schema for a "Student" collection with the following fields:
# a. RollNum
# b. FirstName
# c. LastName
# d. Age
# e. Department
# f. Mark

db = client.student  # Replace 'school' with your database name

# Define the schema for the "Student" collection
student_schema = {
    "RollNum": int,
    "FirstName": str,
    "LastName": str,
    "Age": int,
    "Department": str,
    "Mark": int
}

# Create the "Student" collection with the defined schema
student_collection = db.Student

# Inserting one document with the specified schema to ensure collection creation
student_collection.insert_one({
    "RollNum": 0,
    "FirstName": "Sample",
    "LastName": "Student",
    "Age": 0,
    "Department": "Sample",
    "Mark": 0
})

# Drop the sample document (optional)
student_collection.delete_one({"RollNum": 0})

# Now the "Student" collection is created with the specified schema
print("Schema for 'Student' collection created.")
```

```
Schema for 'Student' collection created.
```

```
student_schema = {
    "RollNum": int,
    "FirstName": str,
    "LastName": str,
    "Age": int,
    "Department": str,
    "Mark": int
}
```

```
# Question no : 02


# 2. Insert the following student data in the collection.
# RollNum FirstName LastName Age Department Mark
# 43 John Doe 20 Computer Science 78
# 67 Alice Smith 22 Physics 59
# 23 Bob Johnson 21 Computer Science 81
# 18 Eve Adams 19 Mathematics 56
# 84 Mike Brown 23 Physics 92

student_data = [
    { "RollNum": 43, "FirstName": "John", "LastName": "Doe", "Age": 20, "Department": "Computer Science", "Mark": 78 },
    { "RollNum": 67, "FirstName": "Alice", "LastName": "Smith", "Age": 22, "Department": "Physics", "Mark": 59 },
    { "RollNum": 23, "FirstName": "Bob", "LastName": "Johnson", "Age": 21, "Department": "Computer Science", "Mark": 81 },
    { "RollNum": 18, "FirstName": "Eve", "LastName": "Adams", "Age": 19, "Department": "Mathematics", "Mark": 56 },
    { "RollNum": 84, "FirstName": "Mike", "LastName": "Brown", "Age": 23, "Department": "Physics", "Mark": 92 }
]
```

```
student_collection = db.Student

# Insert data into the "Student" collection
result = student_collection.insert_many(student_data)
print(f"{len(result.inserted_ids)} documents inserted")
```

```
5 documents inserted
```

```
# Question no : 03
#  3. Write a MongoDB query to find all students.

output=db.Student.find({});
for student in output:
    print(student)
```

```
{'_id': ObjectId('6550ac8810f8b8cf38c8a008'), 'RollNum': 43, 'FirstName': 'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark': 78}
{'_id': ObjectId('6550ac8810f8b8cf38c8a009'), 'RollNum': 67, 'FirstName': 'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
{'_id': ObjectId('6550ac8810f8b8cf38c8a00a'), 'RollNum': 23, 'FirstName': 'Bob', 'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
{'_id': ObjectId('6550ac8810f8b8cf38c8a00b'), 'RollNum': 18, 'FirstName': 'Eve', 'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}
{'_id': ObjectId('6550ac8810f8b8cf38c8a00c'), 'RollNum': 84, 'FirstName': 'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
{'_id': ObjectId('6550ad1c10f8b8cf38c8a00f'), 'RollNum': 43, 'FirstName': 'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark': 78}
{'_id': ObjectId('6550ad1c10f8b8cf38c8a010'), 'RollNum': 67, 'FirstName': 'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
{'_id': ObjectId('6550ad1c10f8b8cf38c8a011'), 'RollNum': 23, 'FirstName': 'Bob', 'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
{'_id': ObjectId('6550ad1c10f8b8cf38c8a012'), 'RollNum': 18, 'FirstName': 'Eve', 'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}
{'_id': ObjectId('6550ad1c10f8b8cf38c8a013'), 'RollNum': 84, 'FirstName': 'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
```

```
# Question no : 04
# 4. Write a MongoDB query to find all students in the "Computer Science" department.

output=db.Student.find({ "Department": "Computer Science" });

for student in output:
    print(student)
```

```
{'_id': ObjectId('6550ac8810f8b8cf38c8a008'), 'RollNum': 43, 'FirstName': 'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark': 78}
{'_id': ObjectId('6550ac8810f8b8cf38c8a00a'), 'RollNum': 23, 'FirstName': 'Bob', 'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
```

```
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a00f'), 'RollNum': 43, 'FirstName': 'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark': 78}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a011'), 'RollNum': 23, 'FirstName': 'Bob', 'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}


# Question no : 05
# 5. Write a MongoDB query to find all students whose age is greater than or equal to 20.


result = db.Student.find({"Age": {"$gte": 20}})

# Print the results
for student in result:
    print(student)

     {'_id': ObjectId('6550ac8810f8b8cf38c8a008'), 'RollNum': 43, 'FirstName': 'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark': 78}
     {'_id': ObjectId('6550ac8810f8b8cf38c8a009'), 'RollNum': 67, 'FirstName': 'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
     {'_id': ObjectId('6550ac8810f8b8cf38c8a00a'), 'RollNum': 23, 'FirstName': 'Bob', 'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
     {'_id': ObjectId('6550ac8810f8b8cf38c8a00c'), 'RollNum': 84, 'FirstName': 'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a00f'), 'RollNum': 43, 'FirstName': 'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark': 78}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a010'), 'RollNum': 67, 'FirstName': 'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a011'), 'RollNum': 23, 'FirstName': 'Bob', 'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a013'), 'RollNum': 84, 'FirstName': 'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}


# Question no : 06
# Write a MongoDB query to find all students whose mark is less than 60.
# Find all students whose mark is less than 60
result = db.Student.find({"Mark": {"$lt": 60}})

# Print the results
for student in result:
    print(student)

     {'_id': ObjectId('6550ac8810f8b8cf38c8a009'), 'RollNum': 67, 'FirstName': 'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
     {'_id': ObjectId('6550ac8810f8b8cf38c8a00b'), 'RollNum': 18, 'FirstName': 'Eve', 'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a010'), 'RollNum': 67, 'FirstName': 'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a012'), 'RollNum': 18, 'FirstName': 'Eve', 'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}


# Question no : 07
# Write a MongoDB query to show the first name and Mark of all students in the "Physics" department.
result =db.Student.find({ "Department": "Physics" }, { "FirstName": 1, "Mark": 1, "_id": 0 });
# Print the results
for student in result:
    print(student)

     {'FirstName': 'Alice', 'Mark': 59}
     {'FirstName': 'Mike', 'Mark': 92}
     {'FirstName': 'Alice', 'Mark': 59}
     {'FirstName': 'Mike', 'Mark': 92}


# Question no : 08
# 08.Write a MongoDB query to find all students in the descending order of Mark.
result =db.Student.find().sort({ "Mark": -1 });
# Print the results
for student in result:
    print(student)

     {'_id': ObjectId('6550ac8810f8b8cf38c8a00c'), 'RollNum': 84, 'FirstName': 'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a013'), 'RollNum': 84, 'FirstName': 'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
     {'_id': ObjectId('6550ac8810f8b8cf38c8a00a'), 'RollNum': 23, 'FirstName': 'Bob', 'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a011'), 'RollNum': 23, 'FirstName': 'Bob', 'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
     {'_id': ObjectId('6550ac8810f8b8cf38c8a008'), 'RollNum': 43, 'FirstName': 'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark': 78}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a00f'), 'RollNum': 43, 'FirstName': 'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark': 78}
     {'_id': ObjectId('6550ac8810f8b8cf38c8a009'), 'RollNum': 67, 'FirstName': 'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a010'), 'RollNum': 67, 'FirstName': 'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
     {'_id': ObjectId('6550ac8810f8b8cf38c8a00b'), 'RollNum': 18, 'FirstName': 'Eve', 'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a012'), 'RollNum': 18, 'FirstName': 'Eve', 'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}


# Question no:-9
# 9 Write a MongoDB query to find the youngest student.

result = db.Student.find({}).sort({ "Age": 1 }).limit(1);


# Print the results
for student in result:
    print(student)

     {'_id': ObjectId('6550ac8810f8b8cf38c8a00b'), 'RollNum': 18, 'FirstName': 'Eve', 'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}


# Question no:-10
# 10. Write a MongoDB query to find all students in the "Physics" department whose RollNum is greater than or equal to 70.
# Find all students in the "Physics" department whose RollNum is greater than or equal to 70
result = db.Student.find({ "Department": "Physics", "RollNum": { "$gte": 70 } })

# Print the results
for student in result:
    print(student)

     {'_id': ObjectId('6550ac8810f8b8cf38c8a00c'), 'RollNum': 84, 'FirstName': 'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
     {'_id': ObjectId('6550ad1c10f8b8cf38c8a013'), 'RollNum': 84, 'FirstName': 'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
```