assignment-6

November 19, 2023

[1]:
```
import pymongo
client=pymongo.MongoClient("mongodb://localhost:27017")
db=client.test
```

[2]:
```
db=client['mardb']
```

Q1-Design a MongoDB schema for a "Student" collection with the following fields:

[3]:
```
collection = db["Student"]
```

Q2- Insert the following student data in the collection

[4]:
```
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}
]
```

[5]:
```
result = collection.insert_many(student_data)
```

Q3-Write a MongoDB query to find all students.

[6]:
```
for i in db.Student.find({}):
    print(i)
```

```
{'_id': ObjectId('6554879cb9b9bd1b857c5fce'), 'RollNum': 43, 'FirstName':
'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark':
78}
{'_id': ObjectId('6554879cb9b9bd1b857c5fcf'), 'RollNum': 67, 'FirstName':
'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
{'_id': ObjectId('6554879cb9b9bd1b857c5fd0'), 'RollNum': 23, 'FirstName': 'Bob',
```

```
'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
{'_id': ObjectId('6554879cb9b9bd1b857c5fd1'), 'RollNum': 18, 'FirstName': 'Eve',
'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}
{'_id': ObjectId('6554879cb9b9bd1b857c5fd2'), 'RollNum': 84, 'FirstName':
'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
{'_id': ObjectId('6559b026d4126227e5bf6200'), 'RollNum': 43, 'FirstName':
'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark':
78}
{'_id': ObjectId('6559b026d4126227e5bf6201'), 'RollNum': 67, 'FirstName':
'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
{'_id': ObjectId('6559b026d4126227e5bf6202'), 'RollNum': 23, 'FirstName': 'Bob',
'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
{'_id': ObjectId('6559b026d4126227e5bf6203'), 'RollNum': 18, 'FirstName': 'Eve',
'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}
{'_id': ObjectId('6559b026d4126227e5bf6204'), 'RollNum': 84, 'FirstName':
'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
```

Q4-Write a MongoDB query to find all students in the “Computer Science” department.

[7]:
```
for i in db.Student.find({"Department": "Computer Science"}):
    print(i)
```

```
{'_id': ObjectId('6554879cb9b9bd1b857c5fce'), 'RollNum': 43, 'FirstName':
'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark':
78}
{'_id': ObjectId('6554879cb9b9bd1b857c5fd0'), 'RollNum': 23, 'FirstName': 'Bob',
'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
{'_id': ObjectId('6559b026d4126227e5bf6200'), 'RollNum': 43, 'FirstName':
'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark':
78}
{'_id': ObjectId('6559b026d4126227e5bf6202'), 'RollNum': 23, 'FirstName': 'Bob',
'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
```

Q5-Write a MongoDB query to find all students whose age is greater than or equal to 20.

[8]:
```
for i in db.Student.find({"Age": {"$gte": 20}}):
    print(i)
```

```
{'_id': ObjectId('6554879cb9b9bd1b857c5fce'), 'RollNum': 43, 'FirstName':
'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark':
78}
{'_id': ObjectId('6554879cb9b9bd1b857c5fcf'), 'RollNum': 67, 'FirstName':
'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
{'_id': ObjectId('6554879cb9b9bd1b857c5fd0'), 'RollNum': 23, 'FirstName': 'Bob',
'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
{'_id': ObjectId('6554879cb9b9bd1b857c5fd2'), 'RollNum': 84, 'FirstName':
'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
{'_id': ObjectId('6559b026d4126227e5bf6200'), 'RollNum': 43, 'FirstName':
'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark':
```

```
78}
{'_id': ObjectId('6559b026d4126227e5bf6201'), 'RollNum': 67, 'FirstName':
'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
{'_id': ObjectId('6559b026d4126227e5bf6202'), 'RollNum': 23, 'FirstName': 'Bob',
'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
{'_id': ObjectId('6559b026d4126227e5bf6204'), 'RollNum': 84, 'FirstName':
'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
```

Q6-Write a MongoDB query to find all students whose mark is less than 60.

[9]:
```
for i in db.Student.find({"Mark": {"$lt": 60}}):
    print(i)
```

```
{'_id': ObjectId('6554879cb9b9bd1b857c5fcf'), 'RollNum': 67, 'FirstName':
'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
{'_id': ObjectId('6554879cb9b9bd1b857c5fd1'), 'RollNum': 18, 'FirstName': 'Eve',
'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}
{'_id': ObjectId('6559b026d4126227e5bf6201'), 'RollNum': 67, 'FirstName':
'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
{'_id': ObjectId('6559b026d4126227e5bf6203'), 'RollNum': 18, 'FirstName': 'Eve',
'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}
```

Q7-Write a MongoDB query to show the first name and Mark of all students in the "Physics" department.

[10]:
```
for i in db.Student.find({"Department": "Physics"}, {"FirstName": 1, "Mark":␣
↪1}):
    print(i)
```

```
{'_id': ObjectId('6554879cb9b9bd1b857c5fcf'), 'FirstName': 'Alice', 'Mark': 59}
{'_id': ObjectId('6554879cb9b9bd1b857c5fd2'), 'FirstName': 'Mike', 'Mark': 92}
{'_id': ObjectId('6559b026d4126227e5bf6201'), 'FirstName': 'Alice', 'Mark': 59}
{'_id': ObjectId('6559b026d4126227e5bf6204'), 'FirstName': 'Mike', 'Mark': 92}
```

Q8-Write a MongoDB query to find all students in the descending order of Mark.

[11]:
```
for i in db.Student.find().sort({"Mark": -1}):
    print(i)
```

```
{'_id': ObjectId('6554879cb9b9bd1b857c5fd2'), 'RollNum': 84, 'FirstName':
'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
{'_id': ObjectId('6559b026d4126227e5bf6204'), 'RollNum': 84, 'FirstName':
'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
{'_id': ObjectId('6554879cb9b9bd1b857c5fd0'), 'RollNum': 23, 'FirstName': 'Bob',
'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
{'_id': ObjectId('6559b026d4126227e5bf6202'), 'RollNum': 23, 'FirstName': 'Bob',
'LastName': 'Johnson', 'Age': 21, 'Department': 'Computer Science', 'Mark': 81}
{'_id': ObjectId('6554879cb9b9bd1b857c5fce'), 'RollNum': 43, 'FirstName':
'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark':
78}
```

```
{'_id': ObjectId('6559b026d4126227e5bf6200'), 'RollNum': 43, 'FirstName':
'John', 'LastName': 'Doe', 'Age': 20, 'Department': 'Computer Science', 'Mark':
78}
{'_id': ObjectId('6554879cb9b9bd1b857c5fcf'), 'RollNum': 67, 'FirstName':
'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
{'_id': ObjectId('6559b026d4126227e5bf6201'), 'RollNum': 67, 'FirstName':
'Alice', 'LastName': 'Smith', 'Age': 22, 'Department': 'Physics', 'Mark': 59}
{'_id': ObjectId('6554879cb9b9bd1b857c5fd1'), 'RollNum': 18, 'FirstName': 'Eve',
'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}
{'_id': ObjectId('6559b026d4126227e5bf6203'), 'RollNum': 18, 'FirstName': 'Eve',
'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}
```

Q9-Write a MongoDB query to find the youngest student.

[12]:
```
for i in db.Student.find().sort({"Age": 1}).limit(1):
    print(i)
```

```
{'_id': ObjectId('6554879cb9b9bd1b857c5fd1'), 'RollNum': 18, 'FirstName': 'Eve',
'LastName': 'Adams', 'Age': 19, 'Department': 'Mathematics', 'Mark': 56}
```

Q10-Write a MongoDB query to find all students in the "Physics" department whose RollNum is greater than or equal to 70.

[13]:
```
for i in db.Student.find({"Department": "Physics", "RollNum": {"$gte": 70}}):
    print(i)
```

```
{'_id': ObjectId('6554879cb9b9bd1b857c5fd2'), 'RollNum': 84, 'FirstName':
'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
{'_id': ObjectId('6559b026d4126227e5bf6204'), 'RollNum': 84, 'FirstName':
'Mike', 'LastName': 'Brown', 'Age': 23, 'Department': 'Physics', 'Mark': 92}
```