CSCI235 Database Systems

MongoDB Data Manipulations

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MongoDB Data Manipluations

Outline

Inserting documents

Removing documents

Updating documents

Inserting documents

A method `insert()` can be used to insert a single document into a
collection

```
db.department.insert(                                            insert()
   { "name":"School of Computing and Information Technology",
     "code":"SCIT",
     "total_staff_number":30,
     "budget":1000000,
     "address":{"street":"Northfields Ave",
                "bldg":3,
                "city":"Wollongong",
                "country":"Australia"},
   }
)
```

Inserting documents

It is possible to insert many documents in one call

```
db.department.insert(                                           insert()
    [ { "_id":1,
        "name":"School of Computing and Information Technology",
        "code":"SCIT",
        "total_staff_number":30,
        "budget":1000000 },
      { "_id":2,
        "name":"School of Electrical Engineering",
        "code":"SENG",
        "total_staff_number":20,
        "budget":100000 },
    ]
)
```

Inserting documents

Restrictions on insertions:

- It is impossible to insert two documents with the same `"_id"` into the same collection

- Insertion of many documents with one call can be done only on one collection

- There is a limit on much data can be inserted in one inserts (48Mb)

- If insertion of many documents with one call fails then entire operation is not rolled back (partial insertion)

- A document must be smaller than 16Mb

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Removing documents

A sample document used in the following examples

```
db.department.insert(                                          Sample document
   { "name":"School of Computing and Information Technology",
     "code":"SCIT",
     "total_staff_number":30,
     "budget":1000000,
     "address":{"street":"Northfields Ave",
                "bldg":3,
                "city":"Wollongong",
                "country":"Australia"},
     "courses":[ {"code":"CSCI835",
                  "title":"Database Systems",
                  "credits":6},
                 {"code":"CSIT115",
                  "title":"Data Management and Security",
                  "credits":6},
                 {"code":"CSCI317",
                  "title":"Database Performance Tuning",
                  "credits":6},
                 {"code":"CSIT321",
                  "title":"Software Project",
                  "credits":12}
                ]
   }
)
```

Removing documents

A method `remove()` can be used to remove the documents from a collection

Remove all documents from a collection

```
db.department.remove({})                                    remove()
```

Remove all departments whose code is `SCIT`

```
db.department.remove({"code":"SCIT"})                       remove()
```

Remove all departments whose name is `School of Physics` and whose code is `SOPH`

```
db.department.remove({"name":"School of Physics","code":"SOPH"})   remove()
```

Drop a collection

```
db.department.drop()                                        drop()
```

MongoDB: Manipluationss

Outline

[Inserting documents](#)

[Removing documents](#)

[Updating documents](#)

Updating documents

Replace `SCIT` department with a new document

```
db.department.update({"code":"SCIT"},
                     {"code":"SCSE","budget":10000})
```
update()

Increment budget of `SCIT` department by `100000`

```
db.department.update({"code":"SCIT"},
                     {$inc:{"budget":100000}})
```
update()

Change a budget of `SCIT` department to `5000000`

```
db.department.update({"code":"SCIT"},
                     {$set:{"budget":5000000}})
```
update()

Multiply a budget of `SCIT` department by `2`

```
db.department.update({"code":"SCIT"},
                     {$mul:{"budget":2}})
```
update()

Updating documents

Rename a key `budget` into `large budget`

```
db.department.update({"code":"SCIT"},
                     {$rename:{"budget":"large budget"}})
```
update()

Remove a `large budget` pair

```
db.department.update({"code":"SCIT"},
                     {$unset:{"large budget":null}})
```
update()

Add a `medium budget` pair

```
db.department.update({"code":"SCIT"},
                     {$set:{"medium budget":1000000}})
```
update()

Create a `last update` pair with the current date

```
db.department.update({"code":"SCIT"},
                     {$set:{"last update":null}})
db.department.update({"code":"SCIT"},
                     {$currentDate:{"last update":true}})
```
update()

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Updating documents

Change credits of a course with a code `CSCI835` to `12`

```
db.department.update({"courses.code":"CSCI835"},          update()
                     {$set: {"courses.0.credits":12}});
```

Delete a course with a code `CSIT321`

```
db.department.update({"courses.code":"CSIT321"},          update()
                     {$pull:{"courses":{"code":"CSIT321"}}})
```

Delete the second course from an array of courses

```
db.department.update({"courses.1.code":{$exists:true}},    update()
                     {$unset:{"courses.1.code":null}})
db.department.update({"courses.code":null},
                     {$pull:{"courses":{"code":null}}})
```

Updating documents

Insert a new course into an array courses

```
db.department.update({"code":"SCIT"},                          update()
                {$push:{"courses":{"code":"MAG101","title":"Magnetism",
                                                    "credits":6}}})
```

Update the first selected element in an array courses

```
db.department.update({"courses.code":"MAG101"},                update()
                {$set:{"courses.$.code":"MAG103"}})
```

References

MongoDB Reference, Operators, Update Operators

Banker L., Bakkum P., Verch S., Garrett D., Hawkins T., MongoDB in Action, Manning, 2016

Chodorow K. MongoDB The Definitive Guide, O'Reilly, 2013, chapter 2