

Assignment B3

Title: MongoDB - Map reduces operations.

Problem Statement:

Implement Map Reduces operation with suitable example using MongoDB.

Objectives:

- to implement concept of map-reduce as data processing paradigm for condensing large volumes of data into useful aggregation result.

S/W H/W Requirements:

Windows 10, 64 bit, 8GB RAM, MongoDB client.

Theory

Map Reduce is data processing paradigm for condensing large volumes of data into useful aggregated results.

SYNTAX:

```
db.collection.mapReduce(  
    function() { emit (key, value); }, // map function  
    function ()  
        { return reduceFunction },  
    {  
        out: collection,  
        query: document,  
        sort: document,  
        limit: number  
    }  
)
```

Map-reduce function first queries the collection, then maps the result documents to emit key-value pairs, which is then reduced based on keys that have multiple values.

In the syntax:

- map is Javascript function that maps a value with key & emits key-value pair.
- Reduce is javascript function that reduces or groups all the documents having same key
- out specifies location of map-reduce query result.
- query - specifies optional selection criteria for selecting documents.

Conclusion:

Successfully implemented MapReduce operation in MongoDB.

Command Prompt - "C:\Program Files\MongoDB\Server\4.4\bin\mongo.exe"

```
> use assignment11
switched to db assignment11
> db.records.insertMany([
... {
...   rollno: 31124,
...   branch: "COMP",
...   marks: 100
... },
... {
...   rollno: 31125,
...   branch: "COMP",
...   marks: 80
... },
... {
...   rollno: 31126,
...   branch: "COMP",
...   marks: 90
... },
... {
...   rollno: 31127,
...   branch: "IT",
...   marks: 40
... },
... {
...   rollno: 31128,
...   branch: "IT",
...   marks: 80
... },
... {
...   rollno: 31129,
...   branch: "EnTC",
...   marks: 120
... }
... ])
```

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Command Prompt - "C:\Program Files\MongoDB\Server\4.4\bin\mongo.exe"

```
{
  "acknowledged" : true,
  "insertedIds" : [
    ObjectId("6195d14f710d58b4db02a3af"),
    ObjectId("6195d14f710d58b4db02a3b0"),
    ObjectId("6195d14f710d58b4db02a3b1"),
    ObjectId("6195d14f710d58b4db02a3b2"),
    ObjectId("6195d14f710d58b4db02a3b3"),
    ObjectId("6195d14f710d58b4db02a3b4")
  ]
}
> var map = function(){emit(this.branch, this.marks)};
> var reduce = function(branch,marks){return Array.sum(marks)};
> db.records.mapReduce(map,reduce,{out : "newCollection"});
{ "result" : "newCollection", "ok" : 1 }
> db.newCollection.find().pretty()
{ "_id" : "COMP", "value" : 270 }
{ "_id" : "IT", "value" : 120 }
{ "_id" : "EnTC", "value" : 120 }
```

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```
"C:\Program Files\MongoDB\Server\4.4\bin\mongo.exe"
```

```
show dbs
```

```
use assignment11
```

```
db.records.insertMany([
```

```
{
```

```
  rollno: 31124,
```

```
  branch: "COMP",
```

```
  marks: 100
```

```
},
```

```
{
```

```
  rollno: 31125,
```

```
  branch: "COMP",
```

```
  marks: 80
```

```
},
```

```
{
```

```
  rollno: 31126,
```

```
  branch: "COMP",
```

```
  marks: 90
```

```
},
```

```
{
```

```
  rollno: 31127,
```

```
  branch: "IT",
```

```
  marks: 40
```

```
},
```

```
{
```

```
  rollno: 31128,
```

```
  branch: "IT",
```

```
  marks: 80
```

```
},
```

```
{
```

```
  rollno: 31129,
```

```
  branch: "EnTC",
```

marks: 120

```
}  
])
```

```
db.records.drop()
```

```
//map: maps a value with a key and emits a key-value pair
```

```
//reduce: reduces or groups all the documents having the same key
```

```
var map = function(){emit(this.branch, this.marks)};
```

```
var reduce = function(branch,marks){return Array.sum(marks)};
```

```
db.records.mapReduce(map,reduce,{out : "newCollection"});
```

```
db.newCollection.find().pretty()
```

```
db.records.find().pretty()
```

```
db.dropDatabase()
```