



Bansilal Ramnath Agarwal Charitable Trust's  
Vishwakarma Institute of Information Technology

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**Subject Name & Code:** Database Management System: ADUA21204

**Title of Assignment:** Implement Map reduce operation with suitable example using MongoDB.

**Assignment No.- 09**

## Assignment no 9

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- Brief about Map-reduce operation in Mongo DB.

Ans Map reduce is a data processing paradigm for condensing large volume of data into useful aggregated result. To perform map reduce operation, MongoDB provide the Map reduce database command.

In this map-reduce operation, MongoDB applies the map phase to each input document (that the document is the collection that match the query condition). The map function emit key-value pairs. For those key that have multiple value, MongoDB applies the reduce phase, which collect and condenses the aggregated data. MongoDB then store the result in a collection. optionally, the output of the reduce-function may pass through a finalize function to further condense or process the result of the aggregation.

## Implementation:

Below collection will be used for the operations

```
demo2> db.stud_info.find().pretty()

{
  _id: ObjectId("61a76e4cd88f14c96e60ba5d"),
  Name: 'AAA',
  Div: 'A',
  Marks: 90
},
{
  _id: ObjectId("61a76e5ad88f14c96e60ba5e"),
  Name: 'BBB',
  Div: 'B',
  Marks: 70
},
{
  _id: ObjectId("61a76e69d88f14c96e60ba5f"),
  Name: 'CCC',
  Div: 'A',
  Marks: 75
},
{
  _id: ObjectId("61a76e75d88f14c96e60ba60"),
  Name: 'DDD',
  Div: 'C',
  Marks: 70
},
}
```

1. Calculates total marks in each division

```
demo2> var mapfunction=function(){emit(this.Div,this.Marks)}

demo2> var reducefunction=function(key,values){return Array.sum(values)}

demo2> db.stud_info.mapReduce(mapfunction,reducefunction,{out:'Result1_mapreduce'})
{ result: 'Result1_mapreduce', ok: 1 }
demo2> db.Result1_mapreduce.find()
[
  { _id: 'B', value: 140 },
  { _id: 'C', value: 70 },
  { _id: 'A', value: 165 }
]
```

2. Calculate average marks in each division

```
demo2> var mapfunction=function(){emit(this.Div,this.Marks)}

demo2> var reducefunction=function(key,values){return Array.avg(values)}

demo2> db.stud_info.mapReduce(mapfunction,reducefunction,{out:'Result1_mapreduce'})
{ result: 'Result1_mapreduce', ok: 1 }
demo2> db.Result1_mapreduce.find()
[
  { _id: 'B', value: 70 },
  { _id: 'C', value: 70 },
  { _id: 'A', value: 82.5 }
]
```