Group B: Assignment No : 3

Assignment Name: -. MongoDB Map Reduce

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

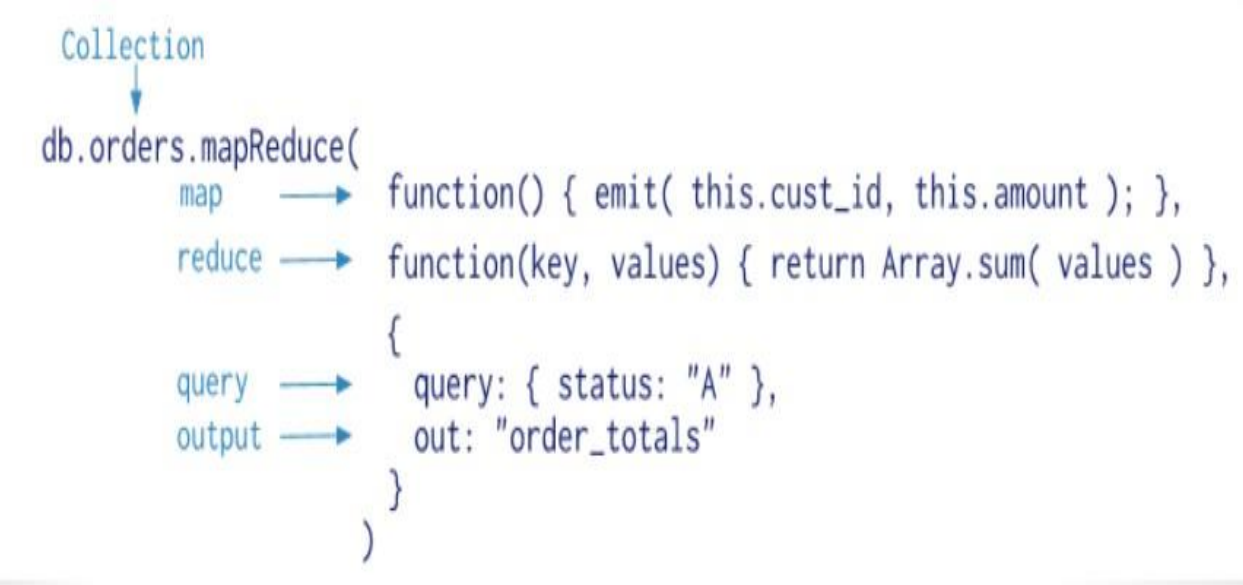
Theory: -

Map-Reduce

• Map-reduce is a data processing paradigm for condensing

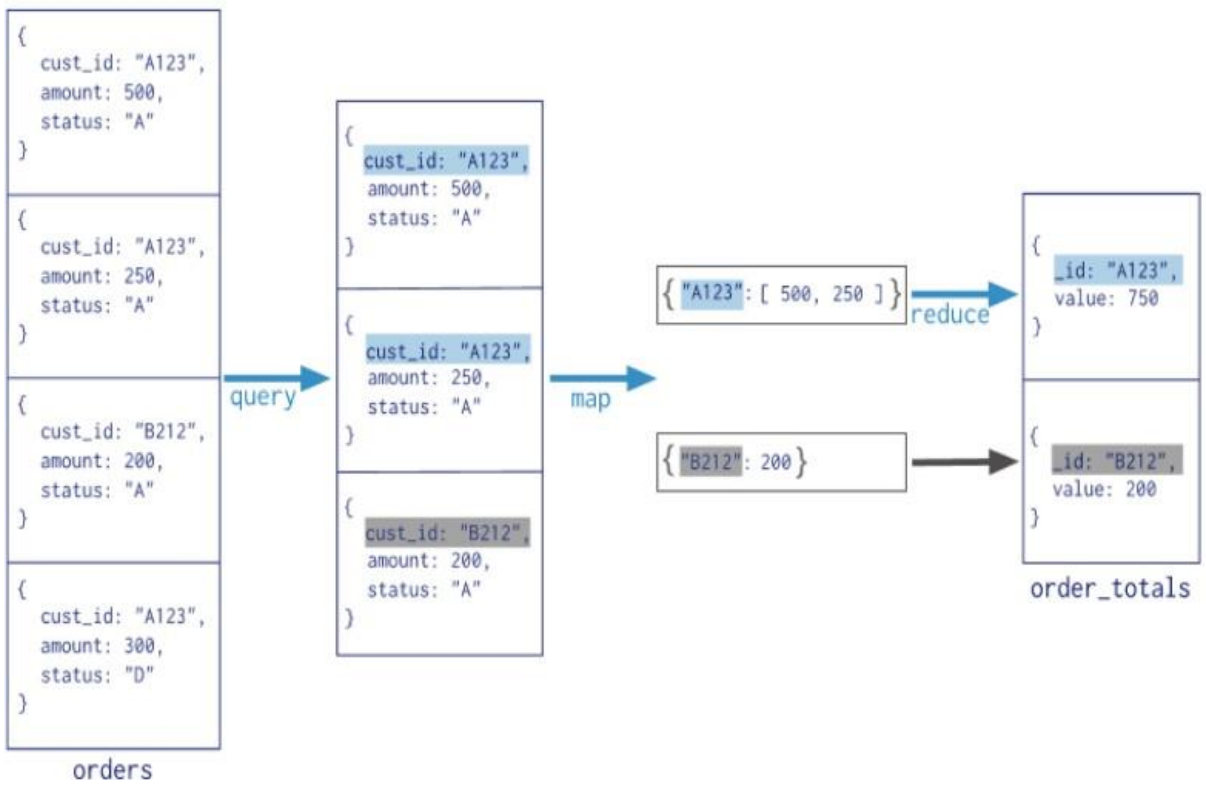
large volumes of data into useful aggregated results. For mapreduce operations, MongoDB provides the mapReduce database command.

• Consider the following map-reduce operation:



```
db.orders.mapReduce(
                   function() { emit( this.cust_id, this.amount ); },
                   function(key, values) { return Array.sum( values ) },
                   {
                     query: { status: "A" },
                     out: "order_totals"
                   }
)
```

MapReduce:


{ cust_id: "A123", amount: 500, status: "A" }
{ cust_id: "A123", amount: 250, status: "A" }
{ cust_id: "B212", amount: 200, status: "A" }
{ cust_id: "A123", amount: 300, status: "D" }
orders
query
{ cust_id: "A123", amount: 500, status: "A" }
{ cust_id: "A123", amount: 250, status: "A" }
{ cust_id: "B212", amount: 200, status: "A" }
map
{ "A123": [500, 250] }
{ "B212": 200 }
reduce
{ _id: "A123", value: 750 }
{ _id: "B212", value: 200 }
order_totals

Map-Reduce:

In very simple terms, the mapReduce command takes 2 primary inputs, the mapper function andthe reducer function.

A Mapper will start off by reading a collection of data and building a Map with only the required fields we wish to process and group them into one array based on the key.

And then this key value pair is fed into a Reducer, which will process the values.

Map-Reduce Syntax:

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

Map-Reduce Syntax Explanation:

The above map-reduce function will query the collection, and then mapthe output documents to the emit key-value pairs. After this, it is reduced based on the keys that have multiple values. Here, we have used the following functions and parameters.

• Map: – It is a JavaScript function. It is used to map a value with a key and produces a key-value pair.

• Reduce: – It is a JavaScript function. It is used to reduce or group together all the documents which have the same key.

• Out: – It is used to specify the location of the map-reduce query output.

• Query: – It is used to specify the optional selection criteria for selecting documents.

• Sort: – It is used to specify the optional sort criteria.

• Limit: – It is used to specify the optional maximum number of documents which are desired to be returned.

Conclusion: Here we performed Mapreduce operation with suitable example using MongoDB.

Question:

1. Define and Explain mapreduce in MongoDB with examples.
2. Why to use Mapreduce in MongoDB