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db.students.insertMany([
  { _id: 1, name: "Amit", age: 15, marks: 85, city: "Delhi" },
  { _id: 2, name: "Priya", age: 14, marks: 90, city: "Mumbai" },
  { _id: 3, name: "Ravi", age: 16, marks: 78, city: "Kolkata" },
  { _id: 4, name: "Simran", age: 17, marks: 88, city: "Bangalore" }])
{ "acknowledged" : true, "insertedIds" : [ 1, 2, 3, 4 ] }

db.students.aggregate([{
  $group: {
    _id: null, // We don't need to group by any field
    averageMarks: { $avg: "$marks" }
  }}])
{ "_id" : null, "averageMarks" : 85.25 }

db.students.aggregate([{
  $group: {
    _id: "$city", // Group by 'city'
    totalStudents: { $sum: 1 } // Count the total number of students in each city
  }}])
{ "_id" : "Bangalore", "totalStudents" : 1 }
{ "_id" : "Kolkata", "totalStudents" : 1 }
{ "_id" : "Mumbai", "totalStudents" : 1 }
{ "_id" : "Delhi", "totalStudents" : 1 }

db.students.aggregate([
  { $sort: { marks: -1 } } // Sort by marks in descending order ]
{ "_id" : 2, "name" : "Priya", "age" : 14, "marks" : 90, "city" : "Mumbai" }
{ "_id" : 4, "name" : "Simran", "age" : 17, "marks" : 88, "city" : "Bangalore" }
{ "_id" : 1, "name" : "Amit", "age" : 15, "marks" : 85, "city" : "Delhi" }
{ "_id" : 3, "name" : "Ravi", "age" : 16, "marks" : 78, "city" : "Kolkata" }

db.students.createIndex({ city: 1 })
{
  "createdCollectionAutomatically" : false,
  "numIndexesBefore" : 1,
  "numIndexesAfter" : 2,
  "ok" : 1
}

db.students.find({ city: "Delhi" })
{ "_id" : 1, "name" : "Amit", "age" : 15, "marks" : 85, "city" : "Delhi" }

db.students.aggregate([
  { $match: { city: { $in: ["Delhi", "Mumbai"] } } }, // Filter students from Delhi or Mumbai
  {
    $group: {
      _id: "$city", // Group by city
      averageMarks: { $avg: "$marks" } // Calculate average marks per city
    }}])
{ "_id" : "Mumbai", "averageMarks" : 90 }
{ "_id" : "Delhi", "averageMarks" : 85 }

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  { _id: 1, name: "Amit", age: 15, marks: 85, city: "Delhi" },
  { _id: 2, name: "Priya", age: 14, marks: 90, city: "Mumbai" },
  { _id: 3, name: "Ravi", age: 16, marks: 78, city: "Kolkata" },
  { _id: 4, name: "Simran", age: 17, marks: 88, city: "Bangalore" }
])
{ "acknowledged" : true, "insertedIds" : [ 1, 2, 3, 4 ] }

var mapFunction = function() {
  emit(this.city, this.marks); // Emit city as the key and marks as the value
};

var reduceFunction = function(key, values) {
  return Array.sum(values); // Sum the marks for each city
};

db.students.mapReduce(
  mapFunction,
  reduceFunction,
  {
    out: "total_marks_by_city" // Store the result in this collection
  }
)
{
  "result" : "total_marks_by_city",
  "timeMillis" : 424,
  "counts" : {
    "input" : 4,
    "emit" : 4,
    "reduce" : 0,
    "output" : 4
  },
  "ok" : 1
}

var finalizeFunction = function(key, value) {
  return value; // You can manipulate the value here if needed
};

db.students.mapReduce(
  mapFunction,
  reduceFunction,
  {
    out: "total_marks_by_city",
    finalize: finalizeFunction // Apply the finalizer to the result
  }
)
{
  "result" : "total_marks_by_city",
  "timeMillis" : 330,
  "counts" : {
}

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        "input" : 4,
        "emit" : 4,
        "reduce" : 0,
        "output" : 4
    },
    "ok" : 1
}

db.total_marks_by_city.find()
{ "_id" : "Bangalore", "value" : 88 }
{ "_id" : "Delhi", "value" : 85 }
{ "_id" : "Kolkata", "value" : 78 }
{ "_id" : "Mumbai", "value" : 90 }
```