

EJERCICIO 1

```
osboxes@mv-bigdata: ~  
Archivo  Editar  Ver  Buscar  Terminal  Ayuda  
  
> show dbs  
admin      0.000GB  
config     0.000GB  
fwd        0.000GB  
local      0.000GB  
usuarios   0.000GB  
> use masterBigData  
switched to db masterBigData  
> db  
masterBigData  
> db.createCollection("aerolineas")  
{ "ok" : 1 }  
> show dbs  
admin      0.000GB  
config     0.000GB  
fwd        0.000GB  
local      0.000GB  
masterBigData 0.000GB  
usuarios   0.000GB  
> 
```

```
osboxes@mv-bigdata: ~/Escritorio  
Archivo  Editar  Ver  Buscar  Terminal  Ayuda  
osboxes@mv-bigdata:~/Escritorio$ mongoimport --db masterBigData --collection aerolineas --file airlines.j  
son --jsonArray  
2023-12-24T16:39:08.678+0100    connected to: localhost  
2023-12-24T16:39:08.868+0100    imported 4408 documents  
osboxes@mv-bigdata:~/Escritorio$ mongo
```

```
osboxes@mv-bigdata: ~/Escritorio  
Archivo  Editar  Ver  Buscar  Terminal  Ayuda  
  
> show dbs  
admin      0.000GB  
config     0.000GB  
fwd        0.000GB  
local      0.000GB  
masterBigData 0.001GB  
usuarios   0.000GB  
> use masterBigData  
switched to db masterBigData  
> show collections  
aerolineas  
> 
```

MongoDB Compass - localhost:27017/masterBigData.aerolineas

Connect Edit View Collection Help

localhost:27017

My Queries

Performance

Databases

Search

admin

config

fwd

local

masterBigData

aerolineas

usuarios

usuarios

My Queries

Databases

aerolineas

masterBigData.aerolineas

01DOCUMENTSINDEXES

DocumentsAggregationsSchemaIndexesValidation

Filter

Type a query: { field: 'value' }

Explain

Reset

Find

Options

ADD DATA

EXPORT DATA

1 - 20 of 4408

_id: ObjectId('65858eda813b3577169368af')

Airport: Object

Time: Object

Statistics: Object

_id: ObjectId('65858eda813b3577169368b0')

Airport: Object

Time: Object

Statistics: Object

_id: ObjectId('65858eda813b3577169368b1')

Airport: Object

Time: Object

Statistics: Object

_id: ObjectId('65858eda813b3577169368b2')

Airport: Object

Time: Object

Statistics: Object

_id: ObjectId('65858eda813b3577169368b3')

Airport: Object

Time: Object

Statistics: Object

>_MONGOSH

MongoDB Compass - localhost:27017/masterBigData.aerolineas

Connect Edit View Collection Help

localhost:27017

My QueriesDatabasesmasterBigDataaerolineas

My QueriesPerformanceDatabasesSearchadminconfigfwdlocalmasterBigDataaerolineasusuarios

masterBigData.aerolineas4.4k1DOCUMENTSINDEXES

DocumentsAggregationsSchemaIndexesValidation

FilterType a query: { field: 'value' }ExplainResetFindOptions

ADD DATAEXPORT DATA1 - 20 of 4408

_id: ObjectId('65858eda813b3577169368af')

Airport: Object

Code: "ATL"Name: "Atlanta, GA: Hartsfield-Jackson Atlanta International"

Time: Object

Label: "2003/06"Month: 6Month Name: "June"Year: 2003

Statistics: Object

of Delays: ObjectCarriers: ObjectFlights: ObjectMinutes Delayed: Object

_id: ObjectId('65858eda813b3577169368b0')

Airport: Object

Code: "BOS"Name: "Boston, MA: Logan International"

Time: Object

Label: "2003/06"Month: 6Month Name: "June"Year: 2003

Statistics: Object

of Delays: ObjectCarriers: ObjectFlights: ObjectMinutes Delayed: Object

>_MONGOSH

EJERCICIO 2

```
osboxes@mv-bigdata: ~
Archivo Editar Ver Buscar Terminal Ayuda
> db.aerolineas.findOne()
{
  "_id" : ObjectId("65858eda813b3577169368af"),
  "Airport" : {
    "Code" : "ATL",
    "Name" : "Atlanta, GA: Hartsfield-Jackson Atlanta International"
  },
  "Time" : {
    "Label" : "2003/06",
    "Month" : 6,
    "Month Name" : "June",
    "Year" : 2003
  },
  "Statistics" : {
    "# of Delays" : {
      "Carrier" : 1009,
      "Late Aircraft" : 1275,
      "National Aviation System" : 3217,
      "Security" : 17,
      "Weather" : 328
    },
    "Carriers" : {
      "Names" : "American Airlines Inc.,JetBlue Airways,Continental Air Lines Inc.,Delta Air Lines Inc.,Atlantic Southeast Airlines,AirTran Airways Corporation,America West Airlines Inc.,Northwest Airlines Inc.,ExpressJet Airlines Inc.,United Air Lines Inc.,US Airways Inc.",
      "Total" : 11
    },
    "Flights" : {
      "Cancelled" : 216,
      "Delayed" : 5843,
      "Diverted" : 27,
      "On Time" : 23974,
      "Total" : 30060
    },
    "Minutes Delayed" : {
      "Carrier" : 61606,
      "Late Aircraft" : 68335,
      "National Aviation System" : 118831,
      "Security" : 518,
      "Total" : 268764,
      "Weather" : 19474
    }
  }
}
```

```
osboxes@mv-bigdata: ~  
Archivo Editar Ver Buscar Terminal Ayuda  
> Object.keys(db.aerolineas.findOne())  
[ "_id", "Airport", "Time", "Statistics" ]  
>
```

```
osboxes@mv-bigdata: ~  
Archivo Editar Ver Buscar Terminal Ayuda  
> // Function to recursively print keys and types  
> function printKeys(obj, prefix = "") {  
...   Object.keys(obj).forEach(function (key) {  
...     var fullPath = prefix + key;  
...     var value = obj[key];  
...  
...     print(fullPath + " : " + typeof value);  
...  
...     if (typeof value === "object" && !Array.isArray(value)) {  
...       // Recursively call for nested objects  
...       printKeys(value, fullPath + ".");  
...     }  
...   });  
... }  
>  
> // Assuming 'aerolineas' is the name of your collection  
> var document = db.aerolineas.findOne();  
>  
> // Call the function for the document  
> printKeys(document);  
_id : object  
Airport : object  
Airport.Code : string
```

osboxes@mv-bigdata: ~

Archivo Editar Ver Buscar Terminal Ayuda

```
> printKeys(document);
_id : object
Airport : object
Airport.Code : string
Airport.Name : string
Time : object
Time.Label : string
Time.Month : number
Time.Month Name : string
Time.Year : number
Statistics : object
Statistics.# of Delays : object
Statistics.# of Delays.Carrier : number
Statistics.# of Delays.Late Aircraft : number
Statistics.# of Delays.National Aviation System : number
Statistics.# of Delays.Security : number
Statistics.# of Delays.Weather : number
Statistics.Carriers : object
Statistics.Carriers.Names : string
Statistics.Carriers.Total : number
Statistics.Flights : object
Statistics.Flights.Cancelled : number
Statistics.Flights.Delayed : number
Statistics.Flights.Diverted : number
Statistics.Flights.On Time : number
Statistics.Flights.Total : number
Statistics.Minutes Delayed : object
Statistics.Minutes Delayed.Carrier : number
Statistics.Minutes Delayed.Late Aircraft : number
Statistics.Minutes Delayed.National Aviation System : number
Statistics.Minutes Delayed.Security : number
Statistics.Minutes Delayed.Total : number
Statistics.Minutes Delayed.Weather : number
> 
```

Descripción de la Colección

¿Para qué se utiliza cada campo?

El campo Airport se utiliza para los códigos y nombres de los aeropuertos.

El campo Time muestra la fecha en meses y años en que se tomaron los datos.

El campo Statistics nos da el número y duración de los retrasos con sus causas.

¿Hay campos que únicamente admiten un conjunto de valores?

Sí, sólo el campo Statistics/Carriers/Names proporciona los nombres de más de una aerolínea, aunque sólo contenga una cadena.

EJERCICIO 3

osboxes@mv-bigdata: ~

Archivo Editar Ver Buscar Terminal Ayuda

```
> db.aerolineas.find( {}, { "Airport.Name": 1, "Statistics.Flights.Total": 1 } ).pretty()
{
  "_id" : ObjectId("65858eda813b3577169368af"),
  "Airport" : {
    "Name" : "Atlanta, GA: Hartsfield-Jackson Atlanta International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 30060
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368b0"),
  "Airport" : {
    "Name" : "Boston, MA: Logan International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 9639
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368b1"),
  "Airport" : {
    "Name" : "Baltimore, MD: Baltimore/Washington International Thurgood Marshall"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 8287
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368b2"),
  "Airport" : {
    "Name" : "Charlotte, NC: Charlotte Douglas International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 8670
    }
  }
}
```



```
}
{
  "_id" : ObjectId("65858eda813b3577169368b3"),
  "Airport" : {
    "Name" : "Washington, DC: Ronald Reagan Washington National"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 6513
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368b4"),
  "Airport" : {
    "Name" : "Denver, CO: Denver International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 11691
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368b5"),
  "Airport" : {
    "Name" : "Dallas/Fort Worth, TX: Dallas/Fort Worth International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 27628
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368b6"),
  "Airport" : {
    "Name" : "Detroit, MI: Detroit Metro Wayne County"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 11754
    }
  }
}
}
```

```
}
{
  "_id" : ObjectId("65858eda813b3577169368b7"),
  "Airport" : {
    "Name" : "Newark, NJ: Newark Liberty International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 12506
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368b8"),
  "Airport" : {
    "Name" : "Fort Lauderdale, FL: Fort Lauderdale-Hollywood International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 4662
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368b9"),
  "Airport" : {
    "Name" : "Washington, DC: Washington Dulles International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 8419
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368ba"),
  "Airport" : {
    "Name" : "Houston, TX: George Bush Intercontinental/Houston"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 15551
    }
  }
}
}
```

```
}
{
  "_id" : ObjectId("65858eda813b3577169368bb"),
  "Airport" : {
    "Name" : "New York, NY: John F. Kennedy International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 5778
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368bc"),
  "Airport" : {
    "Name" : "Las Vegas, NV: McCarran International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 11759
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368bd"),
  "Airport" : {
    "Name" : "Los Angeles, CA: Los Angeles International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 18462
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368be"),
  "Airport" : {
    "Name" : "New York, NY: LaGuardia"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 8908
    }
  }
}
}
```

Archivo Editar Ver Buscar Terminal Ayuda

```
{
  "_id" : ObjectId("65858eda813b3577169368bf"),
  "Airport" : {
    "Name" : "Orlando, FL: Orlando International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 7617
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368c0"),
  "Airport" : {
    "Name" : "Chicago, IL: Chicago Midway International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 7061
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368c1"),
  "Airport" : {
    "Name" : "Miami, FL: Miami International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 4900
    }
  }
}
{
  "_id" : ObjectId("65858eda813b3577169368c2"),
  "Airport" : {
    "Name" : "Minneapolis, MN: Minneapolis-St Paul International"
  },
  "Statistics" : {
    "Flights" : {
      "Total" : 12194
    }
  }
}
Type "it" for more
```

EJERCICIO 4

```
osboxes@mv-bigdata: ~  
Archivo Editar Ver Buscar Terminal Ayuda  
> db.aerolineas.find( {"Time.Year":2016}, {"_id": 0, "Airport.Name": 1, "Statistics.Minutes Delayed.Total": 1 }).sort({"Statistics.Minutes Delayed.Total": -1})  
{ "Airport" : { "Name" : "San Francisco, CA: San Francisco International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 278610 } } }  
{ "Airport" : { "Name" : "Atlanta, GA: Hartsfield-Jackson Atlanta International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 262474 } } }  
{ "Airport" : { "Name" : "Chicago, IL: Chicago O'Hare International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 186921 } } }  
{ "Airport" : { "Name" : "Los Angeles, CA: Los Angeles International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 175743 } } }  
{ "Airport" : { "Name" : "Dallas/Fort Worth, TX: Dallas/Fort Worth International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 147350 } } }  
{ "Airport" : { "Name" : "Las Vegas, NV: McCarran International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 128986 } } }  
{ "Airport" : { "Name" : "Denver, CO: Denver International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 123179 } } }  
{ "Airport" : { "Name" : "Orlando, FL: Orlando International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 110962 } } }  
{ "Airport" : { "Name" : "Fort Lauderdale, FL: Fort Lauderdale-Hollywood International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 103986 } } }  
{ "Airport" : { "Name" : "New York, NY: LaGuardia" }, "Statistics" : { "Minutes Delayed" : { "Total" : 100508 } } }  
{ "Airport" : { "Name" : "Minneapolis, MN: Minneapolis-St Paul International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 99540 } } }  
{ "Airport" : { "Name" : "New York, NY: John F. Kennedy International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 98664 } } }  
{ "Airport" : { "Name" : "Detroit, MI: Detroit Metro Wayne County" }, "Statistics" : { "Minutes Delayed" : { "Total" : 98431 } } }  
{ "Airport" : { "Name" : "Houston, TX: George Bush Intercontinental/Houston" }, "Statistics" : { "Minutes Delayed" : { "Total" : 90829 } } }  
{ "Airport" : { "Name" : "Boston, MA: Logan International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 90747 } } }  
{ "Airport" : { "Name" : "Miami, FL: Miami International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 88939 } } }  
{ "Airport" : { "Name" : "Phoenix, AZ: Phoenix Sky Harbor International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 88252 } } }  
{ "Airport" : { "Name" : "Newark, NJ: Newark Liberty International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 77405 } } }  
{ "Airport" : { "Name" : "Salt Lake City, UT: Salt Lake City International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 76978 } } }  
{ "Airport" : { "Name" : "Seattle, WA: Seattle/Tacoma International" }, "Statistics" : { "Minutes Delayed" : { "Total" : 74017 } } }  
Type "it" for more  
>
```



```
> db.aerolineas.find( { "Time.Year": 2016 }, { "_id": 0, "Airport.Name": 1, "Statistics.Minutes Delayed.Total": 1 } ).sort( { "Statistics.Minutes Delayed.Total": -1 } ).pretty()
{
  "Airport" : {
    "Name" : "San Francisco, CA: San Francisco International"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 278610
    }
  }
}
{
  "Airport" : {
    "Name" : "Atlanta, GA: Hartsfield-Jackson Atlanta International"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 262474
    }
  }
}
{
  "Airport" : {
    "Name" : "Chicago, IL: Chicago O'Hare International"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 186921
    }
  }
}
{
  "Airport" : {
    "Name" : "Los Angeles, CA: Los Angeles International"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 175743
    }
  }
}
{
  "Airport" : {
    "Name" : "Dallas/Fort Worth, TX: Dallas/Fort Worth International"
```

```
{
  "Airport" : {
    "Name" : "Dallas/Fort Worth, TX: Dallas/Fort Worth International"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 147350
    }
  }
}

{
  "Airport" : {
    "Name" : "Las Vegas, NV: McCarran International"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 128986
    }
  }
}

{
  "Airport" : {
    "Name" : "Denver, CO: Denver International"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 123179
    }
  }
}

{
  "Airport" : {
    "Name" : "Orlando, FL: Orlando International"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 110962
    }
  }
}

{
  "Airport" : {
    "Name" : "Fort Lauderdale, FL: Fort Lauderdale-Hollywood International"
  },
  "Statistics" : {
    "Minutes Delayed" : {
```



```
}
{
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 103986
    }
  }
}
{
  "Airport" : {
    "Name" : "New York, NY: LaGuardia"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 100508
    }
  }
}
{
  "Airport" : {
    "Name" : "Minneapolis, MN: Minneapolis-St Paul International"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 99540
    }
  }
}
{
  "Airport" : {
    "Name" : "New York, NY: John F. Kennedy International"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 98664
    }
  }
}
{
  "Airport" : {
    "Name" : "Detroit, MI: Detroit Metro Wayne County"
  },
  "Statistics" : {
    "Minutes Delayed" : {
      "Total" : 98431
    }
  }
}
```

```
}  
{  
  "Airport" : {  
    "Name" : "Houston, TX: George Bush Intercontinental/Houston"  
  },  
  "Statistics" : {  
    "Minutes Delayed" : {  
      "Total" : 90829  
    }  
  }  
}  
{  
  "Airport" : {  
    "Name" : "Boston, MA: Logan International"  
  },  
  "Statistics" : {  
    "Minutes Delayed" : {  
      "Total" : 90747  
    }  
  }  
}  
{  
  "Airport" : {  
    "Name" : "Miami, FL: Miami International"  
  },  
  "Statistics" : {  
    "Minutes Delayed" : {  
      "Total" : 88939  
    }  
  }  
}  
{  
  "Airport" : {  
    "Name" : "Phoenix, AZ: Phoenix Sky Harbor International"  
  },  
  "Statistics" : {  
    "Minutes Delayed" : {  
      "Total" : 88252  
    }  
  }  
}  
{  
  "Airport" : {  
    "Name" : "Newark, NJ: Newark Liberty International"  
  },  
}
```

```
}  
}  
{  
  "Airport" : {  
    "Name" : "Phoenix, AZ: Phoenix Sky Harbor International"  
  },  
  "Statistics" : {  
    "Minutes Delayed" : {  
      "Total" : 88252  
    }  
  }  
}  
}  
{  
  "Airport" : {  
    "Name" : "Newark, NJ: Newark Liberty International"  
  },  
  "Statistics" : {  
    "Minutes Delayed" : {  
      "Total" : 77405  
    }  
  }  
}  
}  
{  
  "Airport" : {  
    "Name" : "Salt Lake City, UT: Salt Lake City International"  
  },  
  "Statistics" : {  
    "Minutes Delayed" : {  
      "Total" : 76978  
    }  
  }  
}  
}  
{  
  "Airport" : {  
    "Name" : "Seattle, WA: Seattle/Tacoma International"  
  },  
  "Statistics" : {  
    "Minutes Delayed" : {  
      "Total" : 74017  
    }  
  }  
}  
}  
Type "it" for more  
> |
```

EJERCICIO 5

osboxes@mv-bigdata: ~

Archivo Editar Ver Buscar Terminal Ayuda

```
> db.aerolineas.aggregate([ { $group: { _id: { Year: "$Time.Year", AirportCode: "$Airport.Code", AirportName: "$Airport.Name" }, maxOnTime: { $max: "$Statistics.Flights.On Time" }, maxDelayed: { $max: "$Statistics.Flights.Delayed" } }}, { $sort: { "_id.Year": 1, maxOnTime: -1, maxDelayed: -1 } }, { $group: { _id: "$_id.Year", mostOnTimeAirport: { $first: "$_id.AirportName" }, mostDelayedAirport: { $first: "$_id.AirportName" }, maxOnTime: { $first: "$maxOnTime" }, maxDelayed: { $first: "$maxDelayed" } } }, { $project: { _id: 0, Year: "$_id", MostOnTimeAirport: "$mostOnTimeAirport", MostDelayedAirport: "$mostDelayedAirport", MaxOnTime: "$maxOnTime", MaxDelayed: "$maxDelayed" } } ] ).pretty()
{
  "Year" : 2016,
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
  "MaxOnTime" : 25424,
  "MaxDelayed" : 3984
}
{
  "Year" : 2015,
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
  "MaxOnTime" : 29448,
  "MaxDelayed" : 6031
}
{
  "Year" : 2014,
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
  "MaxOnTime" : 26873,
  "MaxDelayed" : 7528
}
{
  "Year" : 2013,
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
  "MaxOnTime" : 30033,
  "MaxDelayed" : 10827
}
{
  "Year" : 2006,
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
  "MaxOnTime" : 26769,
  "MaxDelayed" : 13124
}
{
  "Year" : 2005,
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",
```

```
}  
{  
  "Year" : 2005,  
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MaxOnTime" : 31468,  
  "MaxDelayed" : 13699  
}  
{  
  "Year" : 2004,  
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MaxOnTime" : 29114,  
  "MaxDelayed" : 11719  
}  
{  
  "Year" : 2003,  
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MaxOnTime" : 26398,  
  "MaxDelayed" : 7829  
}  
{  
  "Year" : 2007,  
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MaxOnTime" : 28441,  
  "MaxDelayed" : 11931  
}  
{  
  "Year" : 2008,  
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MaxOnTime" : 29152,  
  "MaxDelayed" : 11791  
}  
{  
  "Year" : 2009,  
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MaxOnTime" : 27621,  
  "MaxDelayed" : 11059  
}  
{
```

osboxes@mv-bigdata: ~

Archivo Editar Ver Buscar Terminal Ayuda

```
}  
{  
  "Year" : 2010,  
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MaxOnTime" : 29789,  
  "MaxDelayed" : 8448  
}  
{  
  "Year" : 2011,  
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MaxOnTime" : 29120,  
  "MaxDelayed" : 8192  
}  
{  
  "Year" : 2012,  
  "MostOnTimeAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MostDelayedAirport" : "Atlanta, GA: Hartsfield-Jackson Atlanta International",  
  "MaxOnTime" : 29412,  
  "MaxDelayed" : 7465  
}  
> 
```

EJERCICIO 6

```
osboxes@mv-bigdata: ~  
Archivo Editar Ver Buscar Terminal Ayuda  
> db.aerolineas.aggregate([ { $match: { "Time.Year": 2003 }}, { $unwind: "$Time.Month" }, { $group: { _id: "$Time.Month", totalCancelledFlights: { $sum: "$Statistics.Flights.Cancelled" } }}, { $sort: { totalCancelledFlights: -1 }}, { $project: { _id: 0, Month: "$_id", TotalCancelledFlights: "$totalCancelledFlights" } } ])  
{ "Month" : 12, "TotalCancelledFlights" : 8005 }  
{ "Month" : 8, "TotalCancelledFlights" : 5981 }  
{ "Month" : 9, "TotalCancelledFlights" : 5190 }  
{ "Month" : 7, "TotalCancelledFlights" : 4891 }  
{ "Month" : 11, "TotalCancelledFlights" : 4779 }  
{ "Month" : 10, "TotalCancelledFlights" : 3264 }  
{ "Month" : 6, "TotalCancelledFlights" : 2488 }  
> db.aerolineas.aggregate([ { $match: { "Time.Year": 2003 }}, { $unwind: "$Time.Month" }, { $group: { _id: "$Time.Month", totalCancelledFlights: { $sum: "$Statistics.Flights.Cancelled" } }}, { $sort: { totalCancelledFlights: -1 }}, { $limit: 1 }, { $project: { _id: 0, Month: "$_id", TotalCancelledFlights: "$totalCancelledFlights" } } ])  
{ "Month" : 12, "TotalCancelledFlights" : 8005 }  
>
```


EJERCICIO 7

```
osboxes@mv-bigdata: ~  
Archivo Editar Ver Buscar Terminal Ayuda  
>  
> var totalcause = db.aerolineas.aggregate([ { $group: { _id: null, totalCarrierDelay: { $sum: "$Statistics.Minutes Delayed.Carrier" }, totalLateAir  
craftDelay: { $sum: "$Statistics.Minutes Delayed.Late Aircraft" }, totalNASDelay: { $sum: "$Statistics.Minutes Delayed.National Aviation System" },  
totalSecurityDelay: { $sum: "$Statistics.Minutes Delayed.Security" }, totalWeatherDelay: { $sum: "$Statistics.Minutes Delayed.Weather" }} ]]);  
>  
> var totalcause = totalcause.toArray();  
>  
> let maxPropertyValue = null;  
> let maxPropertyKey = null;  
>  
> // Iterate over the properties of the object  
> for (var key in totalcause[0]) {  
...   const propertyValue = totalcause[0][key];  
...  
...   // Check if the property value is a number  
...   if (maxPropertyValue === null || propertyValue > maxPropertyValue) {  
...     maxPropertyValue = propertyValue;  
...     maxPropertyKey = key;  
...   }  
... }  
totalLateAircraftDelay  
> []
```

EJERCICIO 8

osboxes@mv-bigdata: ~

Archivo Editar Ver Buscar Terminal Ayuda

```
> var resultsForAllMonths = [];
>
> for (var month = 1; month<=12;month++){
...     var totalcause = db.aerolineas.aggregate([
...         {
...             $match: {
...                 "Time.Month": month
...             }
...         },
...         {
...             $group: {
...                 _id: null,
...                 totalCarrierDelay: { $sum: "$Statistics.# of Delays.Carrier" },
...                 totalLateAircraftDelay: { $sum: "$Statistics.# of Delays.Late Aircraft" },
...                 totalNASDelay: { $sum: "$Statistics.# of Delays.National Aviation System" },
...                 totalSecurityDelay: { $sum: "$Statistics.# of Delays.Security" },
...                 totalWeatherDelay: { $sum: "$Statistics.# of Delays.Weather" }
...             }
...         }
...     ]);
...
...     var totalcause = totalcause.toArray();
...
...     let maxPropertyValue = null;
...     let maxPropertyKey = null;
...
...     // Iterate over the properties of the object
...     for (var key in totalcause[0]) {
...         const propertyValue = totalcause[0][key];
...
...         // Check if the property value is a number
...         if (maxPropertyValue === null || propertyValue > maxPropertyValue) {
...             maxPropertyValue = propertyValue;
...             maxPropertyKey = key;
...         }
...     }
...     resultsForAllMonths.push({Month:month, MaxCause:maxPropertyKey, MaxNumber:maxPropertyValue});
... }
12
> printjson(resultsForAllMonths);
[
  {
    "Month" : 1,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 361300
```

```
[
  {
    "Month" : 1,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 361300
  },
  {
    "Month" : 2,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 327089
  },
  {
    "Month" : 3,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 346213
  },
  {
    "Month" : 4,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 312505
  },
  {
    "Month" : 5,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 336636
  },
  {
    "Month" : 6,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 413259
  },
  {
    "Month" : 7,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 395798
  },
  {
    "Month" : 8,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 358986
  },
  {
    "Month" : 9,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 282856
  }
]
```

```
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 312505
  },
  {
    "Month" : 5,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 336636
  },
  {
    "Month" : 6,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 413259
  },
  {
    "Month" : 7,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 395798
  },
  {
    "Month" : 8,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 358986
  },
  {
    "Month" : 9,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 282856
  },
  {
    "Month" : 10,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 338616
  },
  {
    "Month" : 11,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 315735
  },
  {
    "Month" : 12,
    "MaxCause" : "totalNASDelay",
    "MaxNumber" : 418797
  }
}
```

]

>