





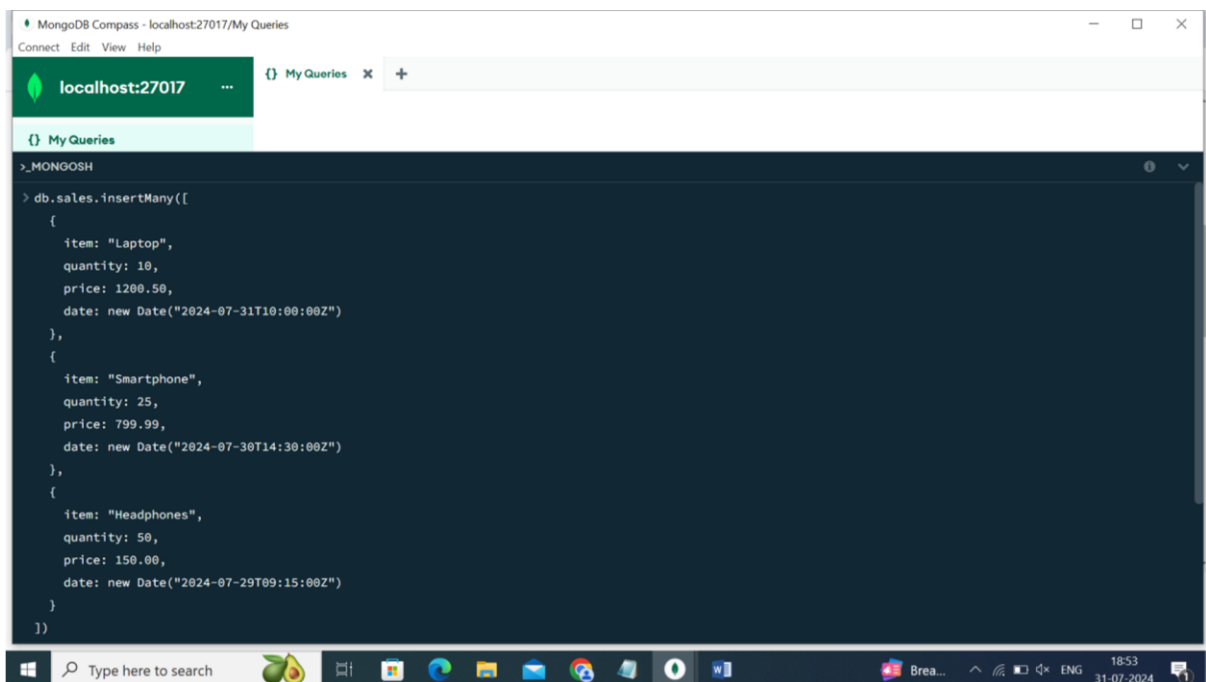
## Assignment 2: Aggregation Framework

Objective: Understand and use the aggregation framework to perform complex data analysis.

DATE:31/07/2024

### Tasks:

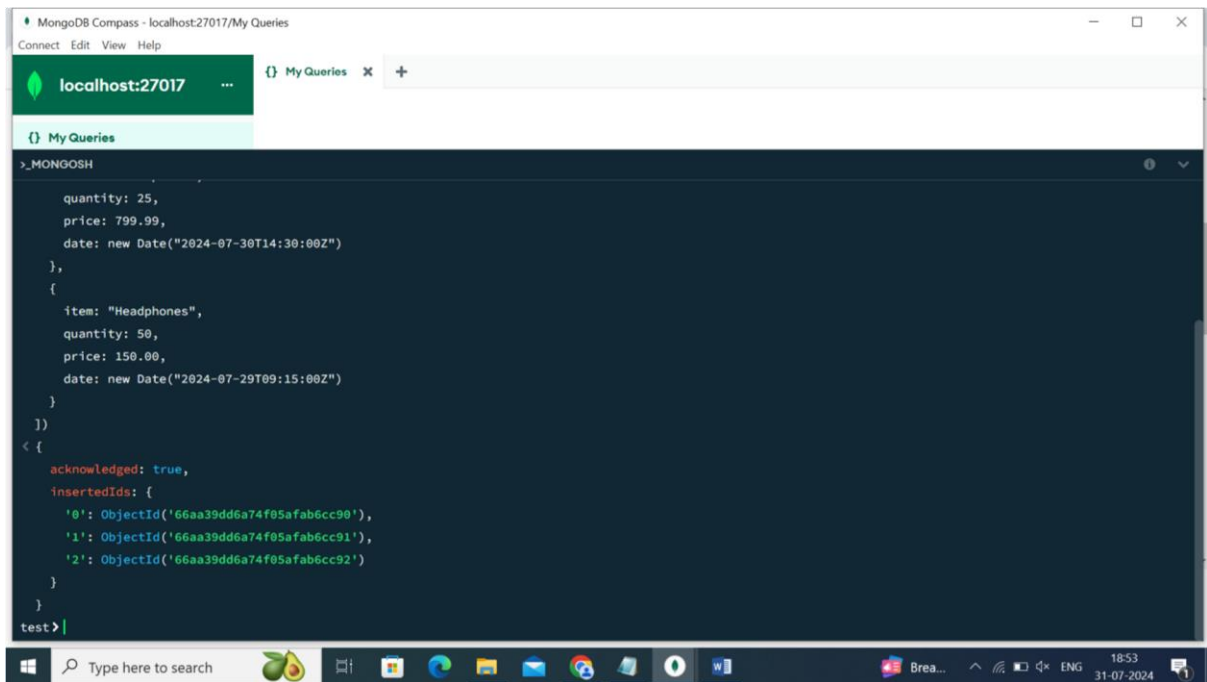
1.Insert documents into a sales collection with fields such as item, quantity, price, and date.



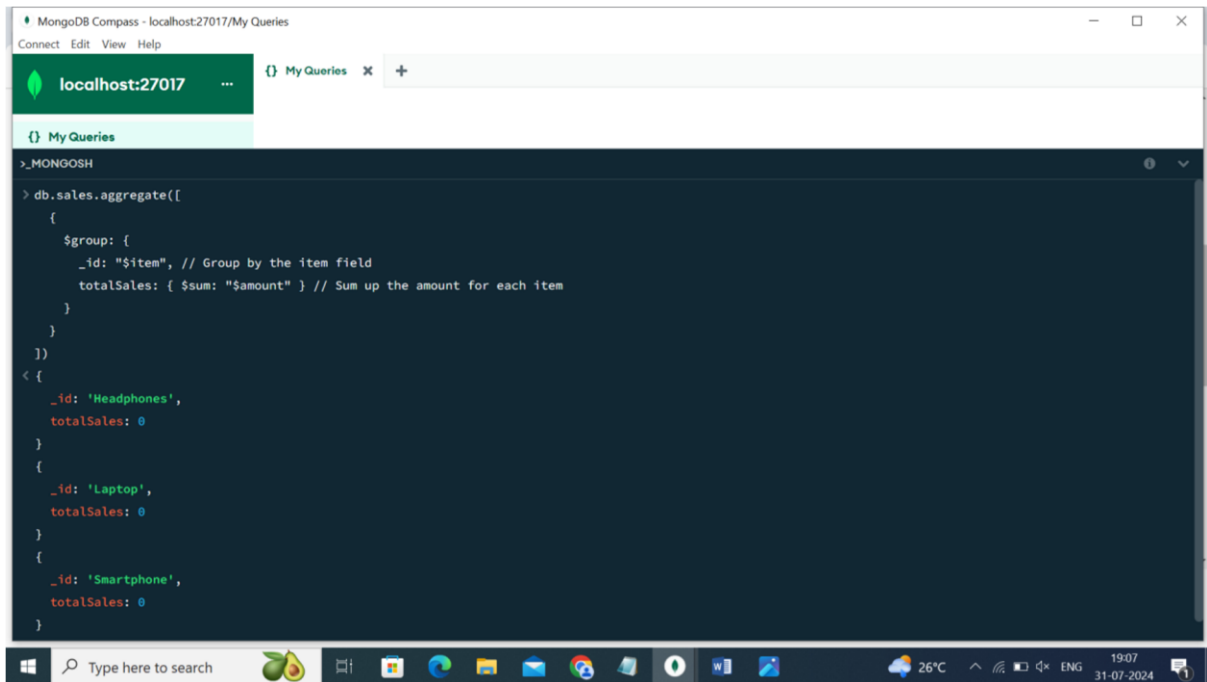
The screenshot shows the MongoDB Compass application window titled "MongoDB Compass - localhost:27017/My Queries". The interface includes a top bar with "Connect", "Edit", "View", and "Help" menus. Below the top bar, there's a green tab labeled "localhost:27017" and a tab labeled "My Queries". The main area is a dark-themed console with the following JavaScript code:

```
>_MONGOSH
> db.sales.insertMany([
  {
    item: "Laptop",
    quantity: 10,
    price: 1200.50,
    date: new Date("2024-07-31T10:00:00Z")
  },
  {
    item: "Smartphone",
    quantity: 25,
    price: 799.99,
    date: new Date("2024-07-30T14:30:00Z")
  },
  {
    item: "Headphones",
    quantity: 50,
    price: 150.00,
    date: new Date("2024-07-29T09:15:00Z")
  }
])
```

The Windows taskbar at the bottom shows the search bar, task view button, and several application icons. The system tray on the right indicates the time as 18:53 on 31-07-2024.

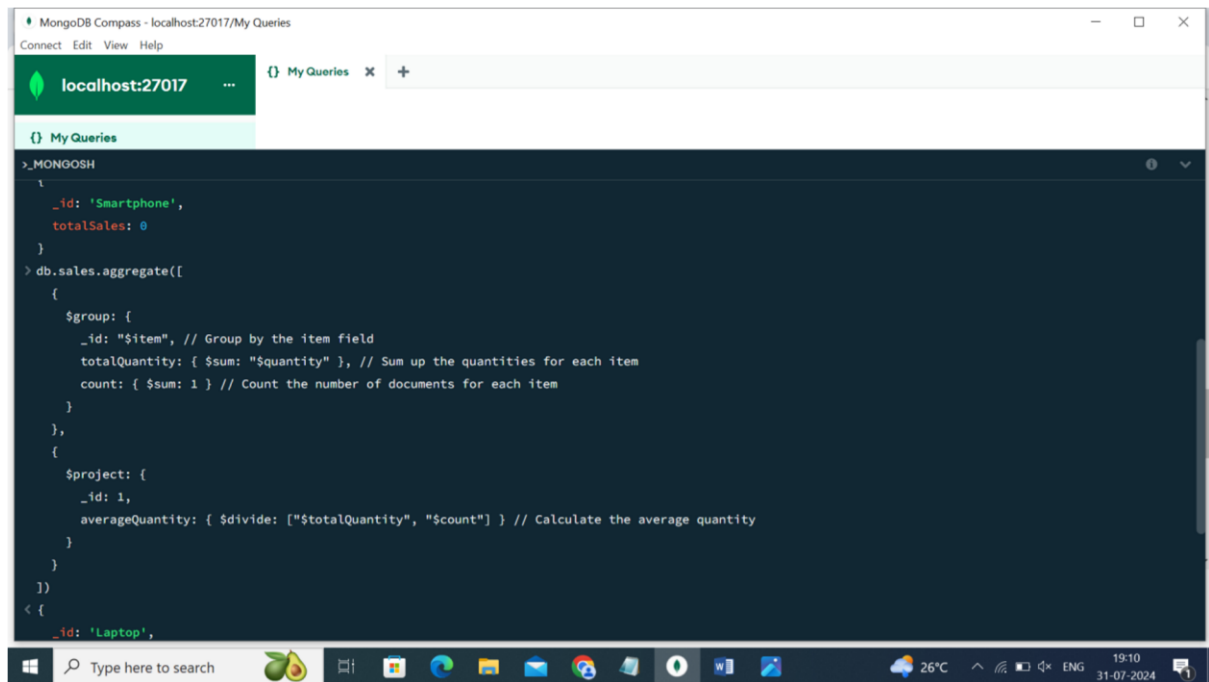


## 2. Calculate the total sales amount for each item.



The screenshot shows the MongoDB Compass interface. The top bar indicates the connection to 'localhost:27017'. The 'My Queries' tab is active, showing a query in the editor. The query is an aggregate pipeline that groups sales data by item and calculates the total sales amount for each item. The results are displayed in a JSON format, showing three items: Headphones, Laptop, and Smartphone, each with a total sales amount of 0.

```
>_MONGOSH
> db.sales.aggregate([
  {
    $group: {
      _id: "$item", // Group by the item field
      totalSales: { $sum: "$amount" } // Sum up the amount for each item
    }
  }
])
< {
  _id: 'Headphones',
  totalSales: 0
}
{
  _id: 'Laptop',
  totalSales: 0
}
{
  _id: 'Smartphone',
  totalSales: 0
}
```



3. Find the average quantity sold per item

MongoDB Compass - localhost:27017/My Queries

Connect Edit View Help

localhost:27017 ... {} My Queries x +

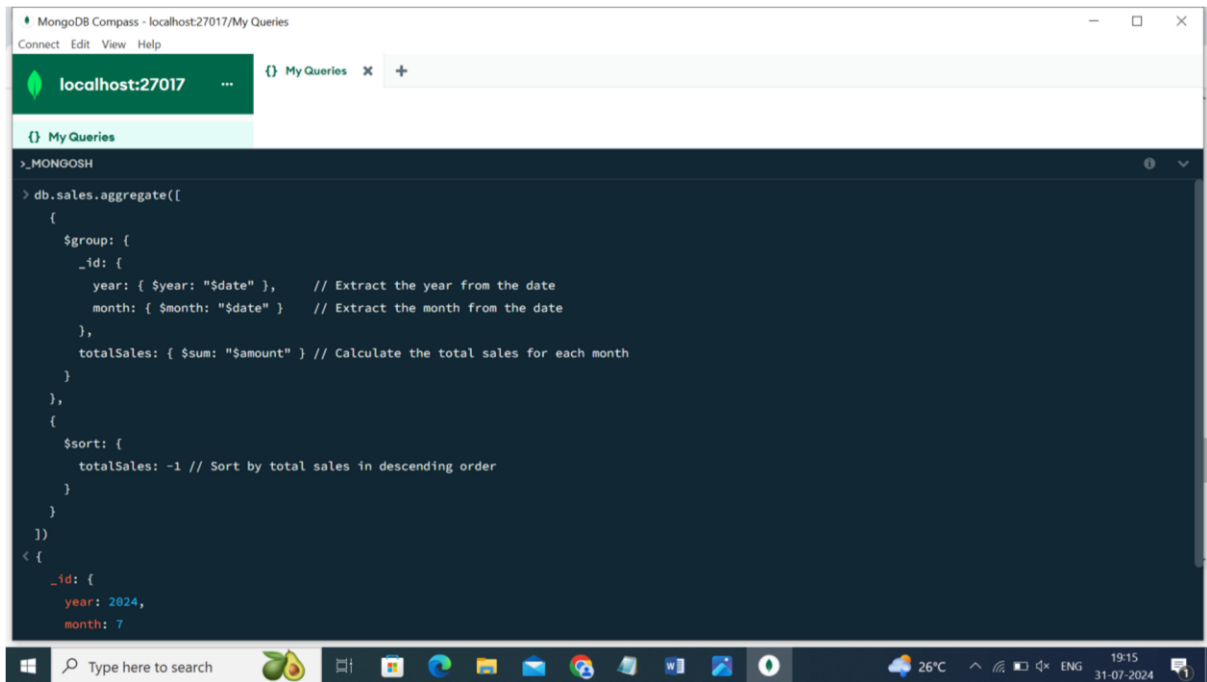
{ } My Queries

```
>_MONGOSH
{
  $project: {
    _id: 1,
    averageQuantity: { $divide: ["$totalQuantity", "$count"] } // Calculate the average quantity
  }
}
))
< {
  _id: 'Laptop',
  averageQuantity: 10
}
{
  _id: 'Smartphone',
  averageQuantity: 25
}
{
  _id: 'Headphones',
  averageQuantity: 50
}
}
test>
```

Type here to search

26°C 19:10 31-07-2024

4.Group sales by month and calculate the total sales foreach month and sort from the largest value

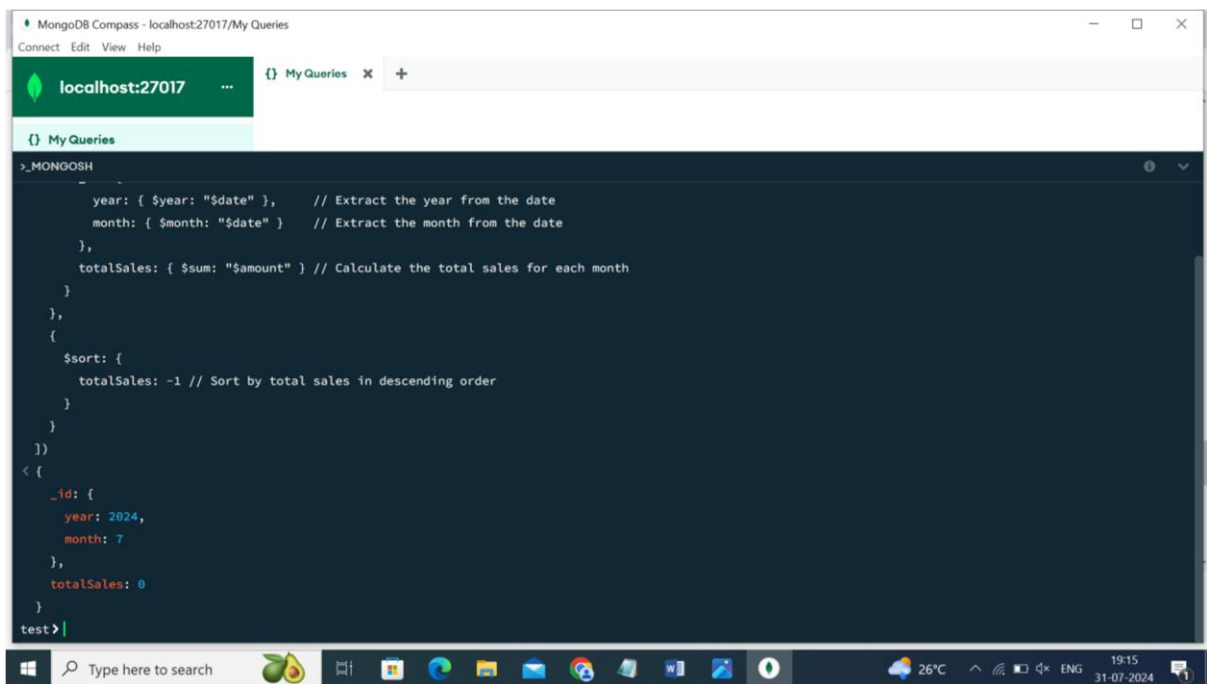


The screenshot shows the MongoDB Compass interface. The top bar indicates the connection to 'localhost:27017'. The 'My Queries' tab is active. The query editor contains the following JavaScript code:

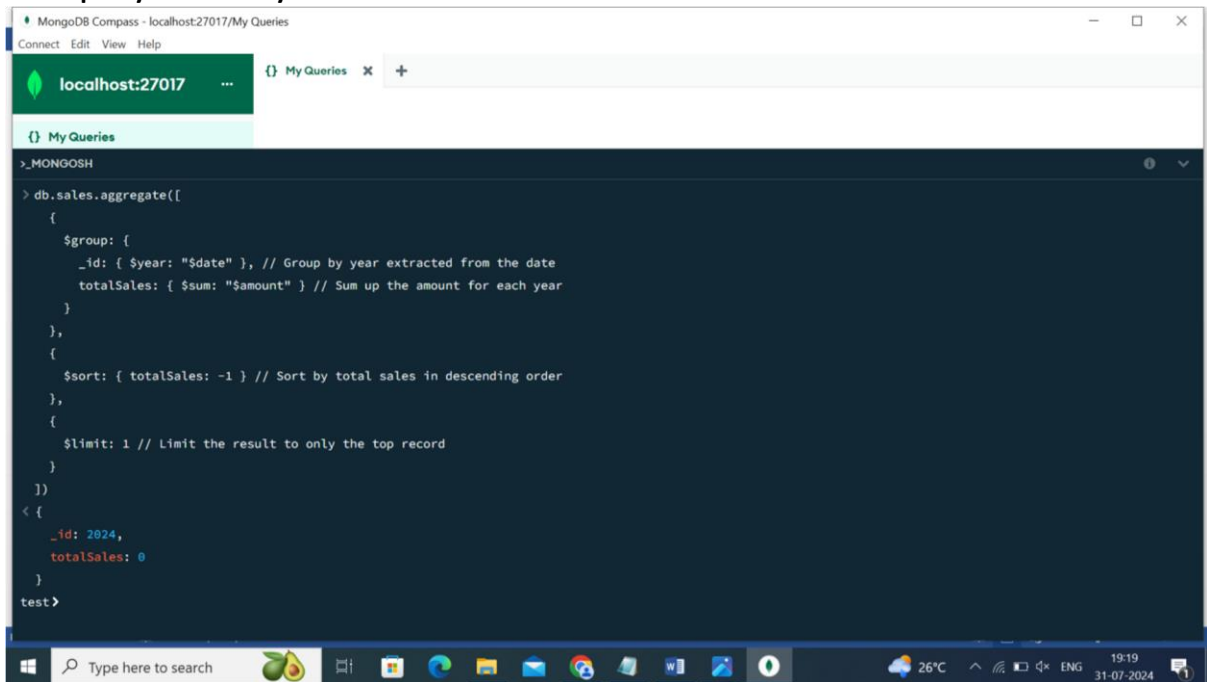
```
>_MONGOSH
> db.sales.aggregate([
  {
    $group: {
      _id: {
        year: { $year: "$date" }, // Extract the year from the date
        month: { $month: "$date" } // Extract the month from the date
      },
      totalSales: { $sum: "$amount" } // Calculate the total sales for each month
    }
  },
  {
    $sort: {
      totalSales: -1 // Sort by total sales in descending order
    }
  }
])
< {
  _id: {
    year: 2024,
    month: 7
```

The Windows taskbar at the bottom shows the system clock as 19:15 on 31-07-2024, with a temperature of 26°C.





5.Display which year has the maximum sales.



The screenshot shows the MongoDB Compass interface. The top bar indicates the connection to 'localhost:27017/My Queries'. The main editor displays the following aggregate query:

```
>_MONGOSH
> db.sales.aggregate([
  {
    $group: {
      _id: { $year: "$date" }, // Group by year extracted from the date
      totalSales: { $sum: "$amount" } // Sum up the amount for each year
    }
  },
  {
    $sort: { totalSales: -1 } // Sort by total sales in descending order
  },
  {
    $limit: 1 // Limit the result to only the top record
  }
])
< {
  _id: 2024,
  totalSales: 0
}
test>
```

The Windows taskbar at the bottom shows the system clock as 19:19 on 31-07-2024, with a temperature of 26°C.

## 6. Write aggregation pipelines to:

