

Title: DB Assignment 5  
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Date: 11/22/24

**1. Over how many years was the unemployment data collected?**

```
> db.unemployment.distinct("Year").length;  
< 27  
test> |
```

**2. How many states were reported on in this dataset?**

```
> db.unemployment.distinct("State").length;  
< 47  
test>
```

**3. What does this query compute?**

`db.unemployment.find({Rate : {$lt: 1.0}}).count()`

```
> db.unemployment.find({Rate: {$lt: 1.0}}).count();  
< 657  
test> |
```

It counts the number of counties where the unemployment rate is less than 1.0%.

**4. Find all counties with unemployment rate higher than 10%**

```
> db.unemployment.aggregate([  
  { $match: { Rate: { $gt: 10.0 } } },  
  { $group: { _id: { County: "$County", State: "$State" } } },  
  { $count: "count" }  
]);  
< {  
  count: 1887  
}  
test>
```

There are way too many to document so i shared the count.

**5. Calculate the average unemployment rate across all states.**

```

> db.unemployment.aggregate([
  { $group: { _id: null, averageRate: { $avg: "$Rate" } } }
]);
< {
  _id: null,
  averageRate: 6.1750097115006755
}
test>

```

6. Find all counties with an unemployment rate between 5% and 8%.

```

> db.unemployment.aggregate([
  { $match: { Rate: { $gt: 5.0 } } },
  { $group: { _id: { County: "$County", State: "$State" } } },
  { $count: "count" }
]);
< {
  count: 2835
}
test>

```

7. Find the state with the highest unemployment rate. Hint. Use { \$limit: 1 }

```

> db.unemployment.aggregate([
  { $group: { _id: "$State", avgRate: { $avg: "$Rate" } } },
  { $sort: { avgRate: -1 } },
  { $limit: 1 }
]);
< {
  _id: 'Arizona',
  avgRate: 9.274588477366255
}
test>

```

8. Count how many counties have an unemployment rate above 5%.

```
> db.unemployment.aggregate([
  { $match: { Rate: { $gt: 5.0 } } },
  { $group: { _id: { County: "$County", State: "$State" } } },
  { $count: "uniqueCounties" }
]);
< {
  uniqueCounties: 2835
}
test> |
```

9. Calculate the average unemployment rate per state by year.

```
> db.unemployment.aggregate([
  {
    $group: {
      _id: { State: "$State", Year: "$Year" }, // Group by State and Year
      averageRate: { $avg: "$Rate" }          // Calculate the average Rate for each group
    }
  },
  {
    $sort: { "_id.Year": 1, "_id.State": 1 }   // Sort the result by Year and State
  }
]);
< {
  _id: {
    State: 'Alabama',
    Year: 1990
  },
  averageRate: 8.226990049751244
},
{
  _id: {
    State: 'Arizona',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Arkansas',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'California',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Colorado',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Connecticut',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Delaware',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Florida',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Georgia',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Hawaii',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Idaho',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Illinois',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Indiana',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Iowa',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Kansas',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Kentucky',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Louisiana',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Maine',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Maryland',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Massachusetts',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Michigan',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Minnesota',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Mississippi',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Missouri',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Montana',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Nebraska',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Nevada',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'New Hampshire',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'New Jersey',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'New Mexico',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'New York',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'North Carolina',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'North Dakota',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Ohio',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Oklahoma',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Oregon',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Pennsylvania',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Rhode Island',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'South Carolina',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'South Dakota',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Tennessee',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Texas',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Utah',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Vermont',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Virginia',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Washington',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'West Virginia',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Wisconsin',
    Year: 1990
  },
  averageRate: 8.285555555555556
},
{
  _id: {
    State: 'Wyoming',
    Year: 1990
  },
  averageRate: 8.285555555555556
}
]
```

10. (Extra Credit) For each state, calculate the total unemployment rate across all counties (sum of all county rates).

This makes some weird numbers.

```
Type "it" for more
> db.unemployment.aggregate([
  {
    $group: {
      _id: { State: "$State" },
      totalRate: { $sum: "$Rate" }
    }
  },
  {
    $sort: { "_id.State": 1 }
  }
]);
< {
  _id: {
    State: 'Alabama'
  },
  totalRate: 167669.2
}
{
  _id: {
    State: 'Arizona'
  },
  totalRate: 45074.5
}
{
  _id: {
    State: 'Arkansas'
  },
  totalRate: 164807.7
}
```

11. (Extra Credit) The same as Query 10 but for states with data from 2015 onward

```
> db.unemployment.aggregate([
  {
    $match: { Year: { $gte: 2015 } }
  },
  {
    $group: {
      _id: { State: "$State" },
      totalRate: { $sum: "$Rate" }
    }
  },
  {
    $sort: { "_id.State": 1 }
  }
]);
< {
  _id: {
    State: 'Alabama'
  },
  totalRate: 11100.7
}
{
  _id: {
    State: 'Arizona'
  },
  totalRate: 2974.4
}
{
  _id: {
```