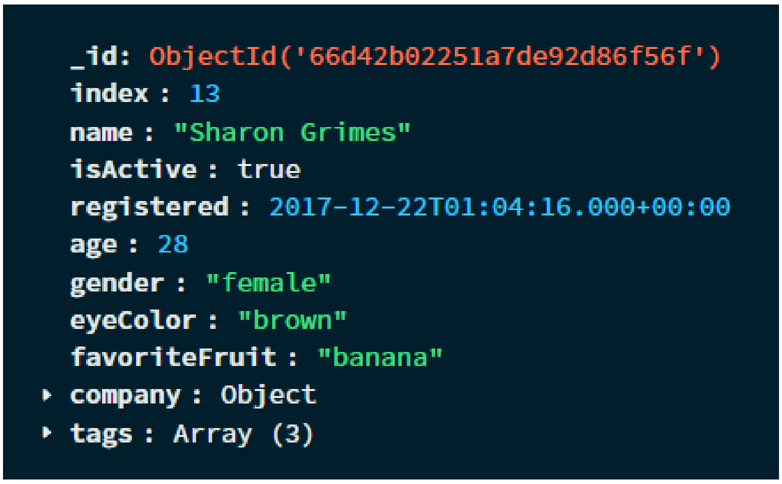
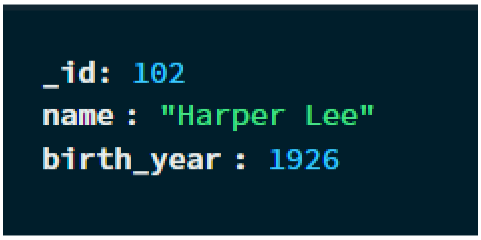
MongoDB Aggregation Pipelining Project

User Schema:



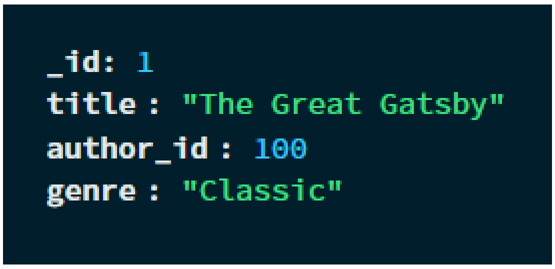
```
  _id: ObjectId('66d42b02251a7de92d86f56f')
  index : 13
  name : "Sharon Grimes"
  isActive : true
  registered : 2017-12-22T01:04:16.000+00:00
  age : 28
  gender : "female"
  eyeColor : "brown"
  favoriteFruit : "banana"
▸ company : Object
▸ tags : Array (3)
```

Author Schema:



```
_id: 102
name : "Harper Lee"
birth_year : 1926
```

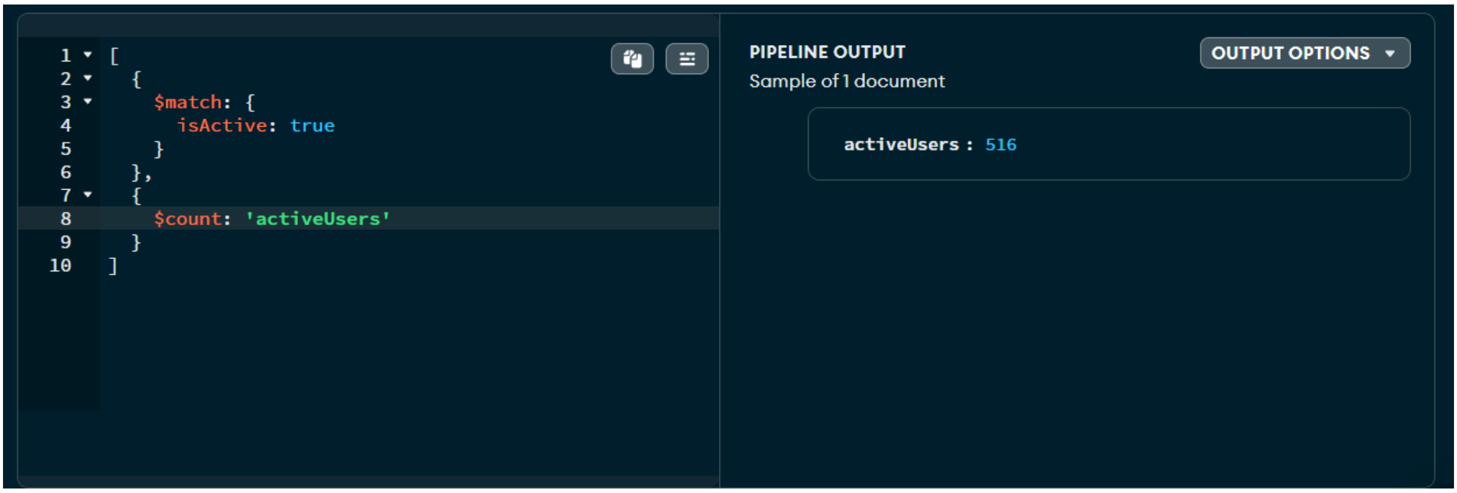
Book Schema:



```
_id: 1
title : "The Great Gatsby"
author_id : 100
genre : "Classic"
```

- Dhruv Rajput
- 2K21/EP/34

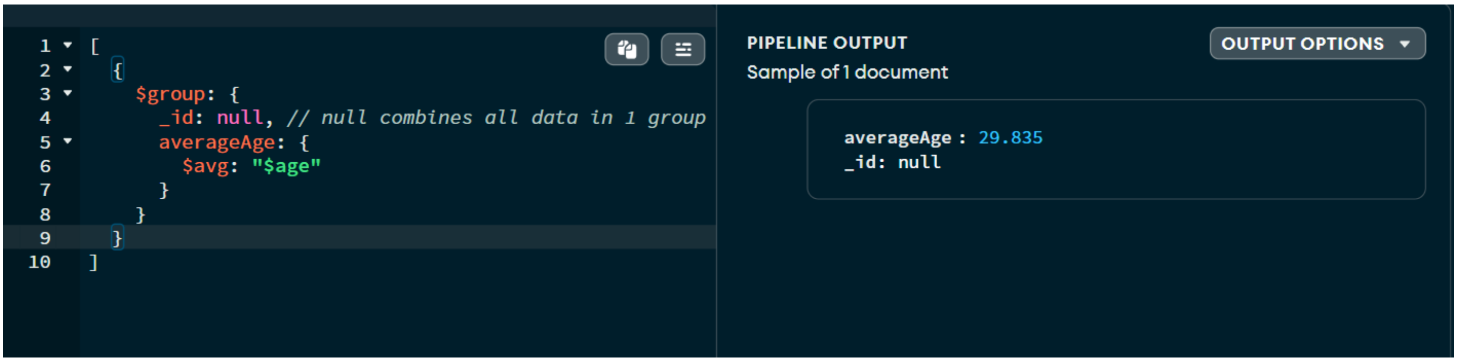
Q1. How many users are active?



```
[
  {
    $match: {
      isActive: true
    }
  },
  {
    $count: 'activeUsers'
  }
]
```

```
activeUsers : 516
```

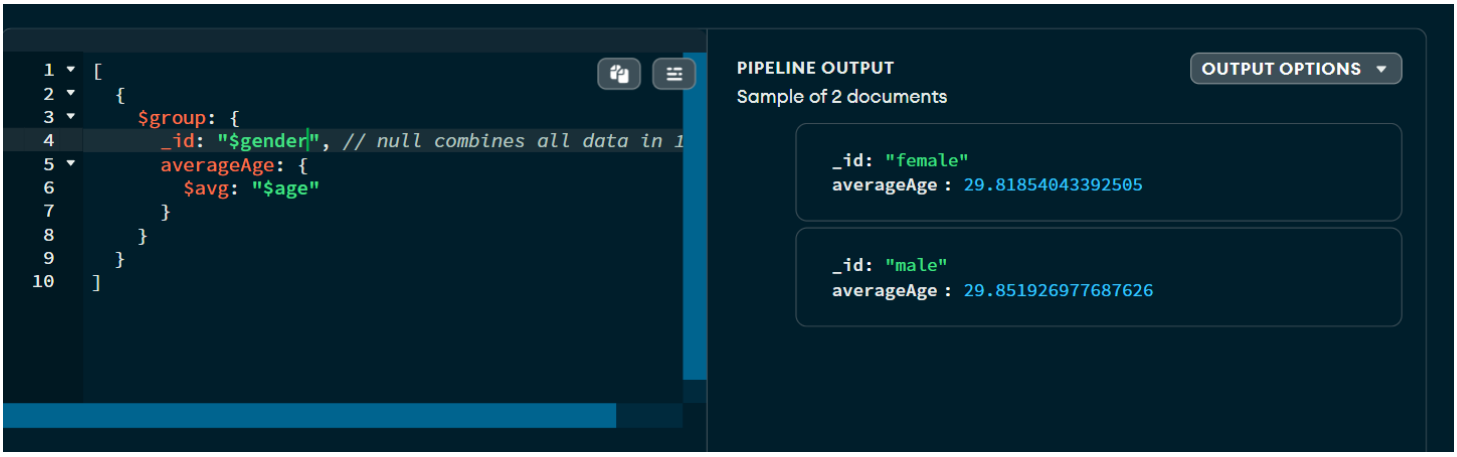
Q2. What is the average age of all users?



```
[
  {
    $group: {
      _id: null, // null combines all data in 1 group
      averageAge: {
        $avg: "$age"
      }
    }
  }
]
```

```
averageAge : 29.835
_id: null
```

Q3. Find average age of Male and Female.

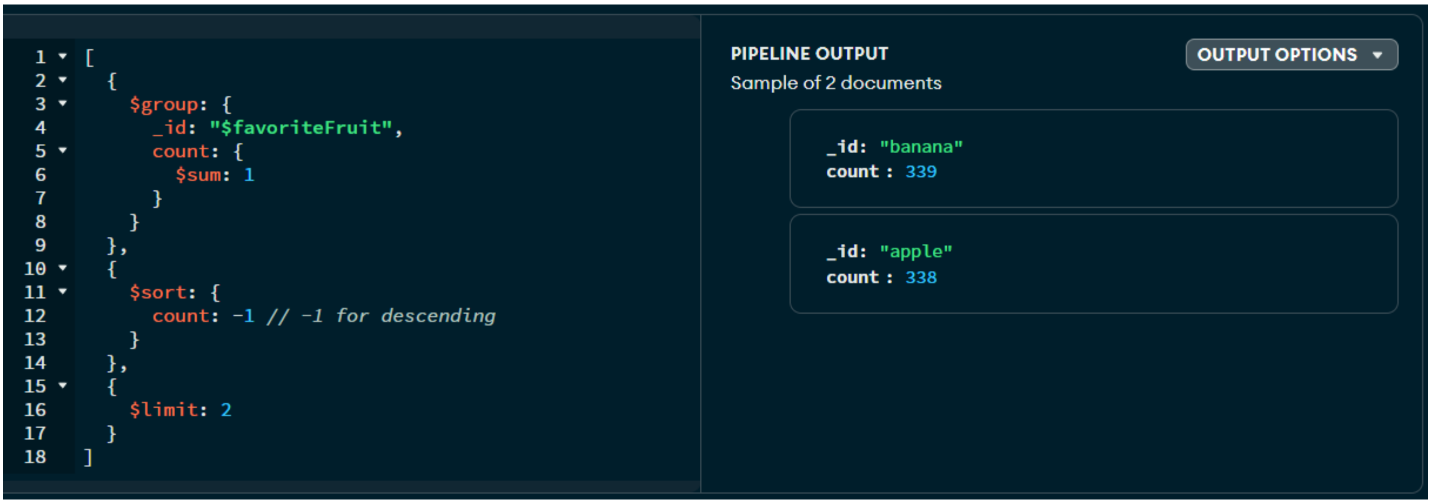


```
[
  {
    $group: {
      _id: "$gender", // null combines all data in 1
      averageAge: {
        $avg: "$age"
      }
    }
  }
]
```

```
_id: "female"
averageAge : 29.81854043392505
```

```
_id: "male"
averageAge : 29.851926977687626
```

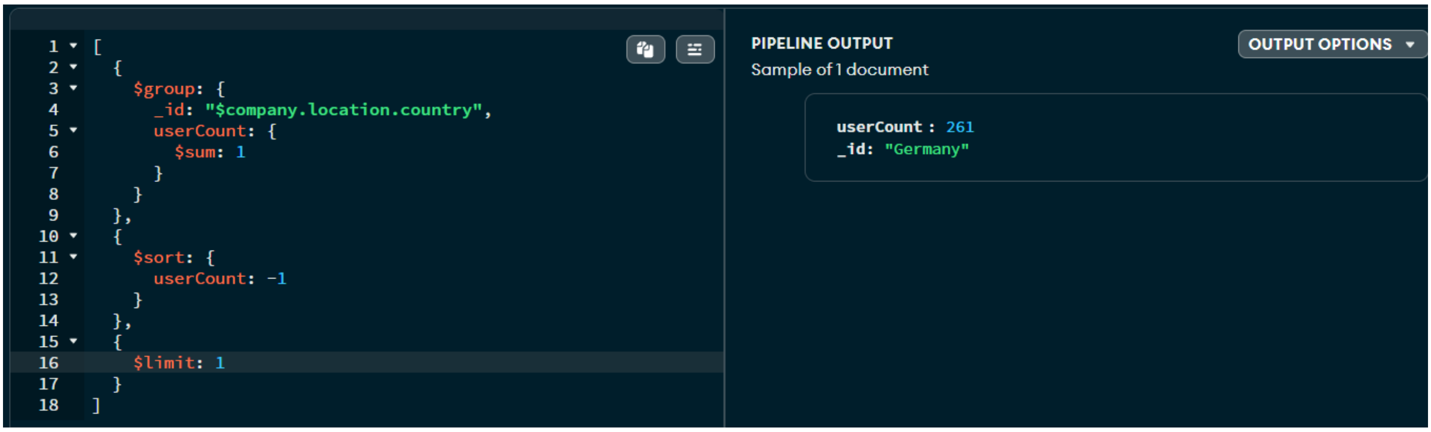
Q4. List the top 2 most common fruits among the users.



```
[
  {
    $group: {
      _id: "$favoriteFruit",
      count: {
        $sum: 1
      }
    }
  },
  {
    $sort: {
      count: -1 // -1 for descending
    }
  },
  {
    $limit: 2
  }
]
```

```
_id: "banana"
count : 339

_id: "apple"
count : 338
```

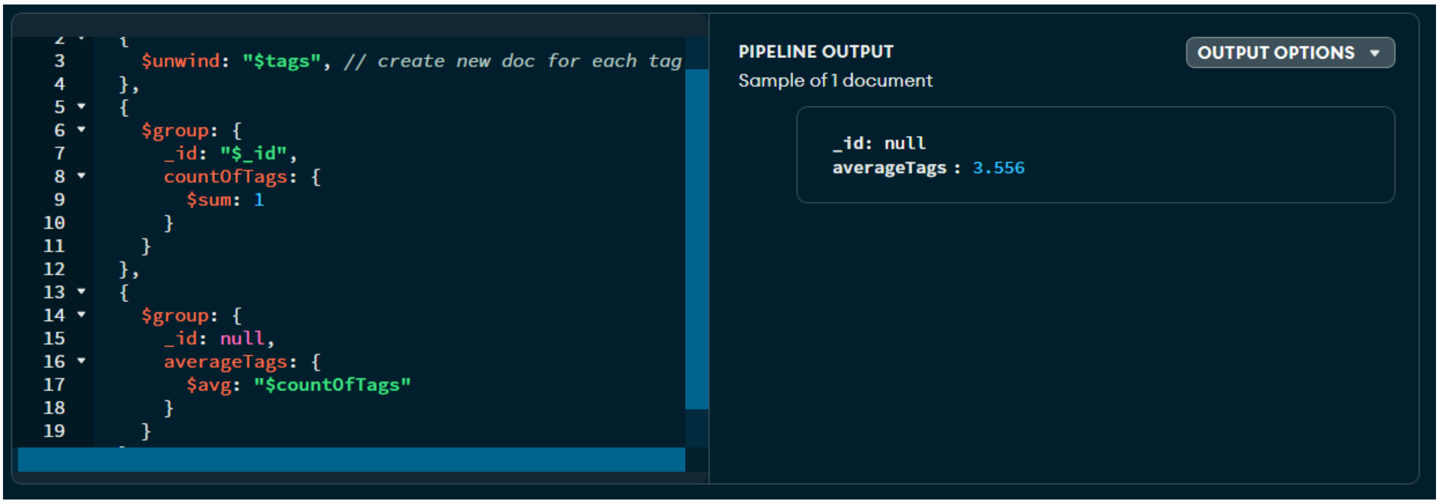
Q5. Which country has the highest number of registered users?



```
[
  {
    $group: {
      _id: "$company.location.country",
      userCount: {
        $sum: 1
      }
    }
  },
  {
    $sort: {
      userCount: -1
    }
  },
  {
    $limit: 1
  }
]
```

```
userCount : 261
_id: "Germany"
```

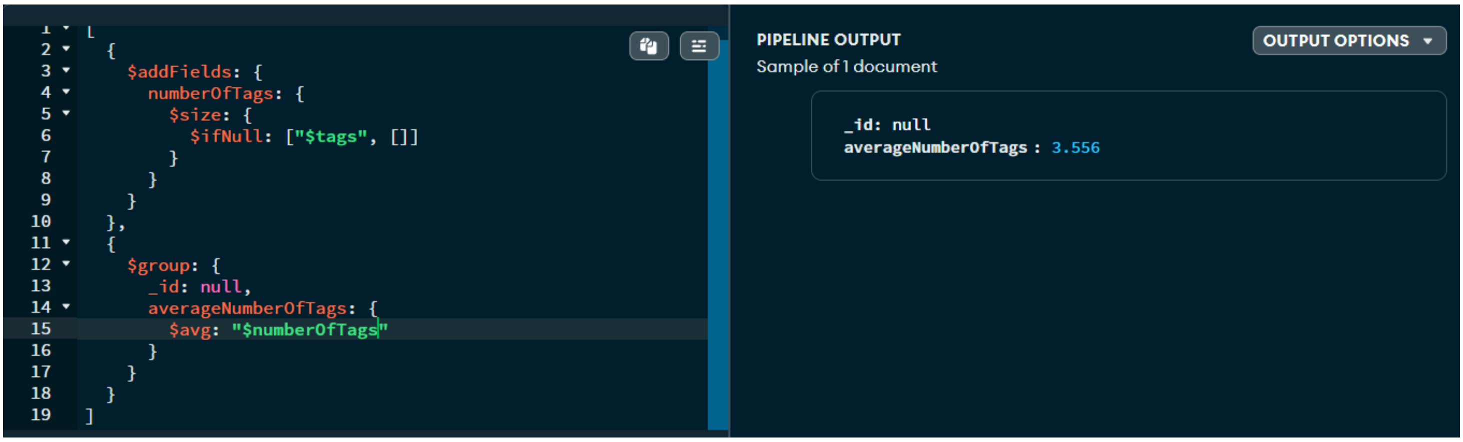
Q6. What is the average number of tags per user?



```
    $unwind: "$tags", // create new doc for each tag
  },
  {
    $group: {
      _id: "$_id",
      countOfTags: {
        $sum: 1
      }
    }
  },
  {
    $group: {
      _id: null,
      averageTags: {
        $avg: "$countOfTags"
      }
    }
```

```
_id: null
averageTags : 3.556
```

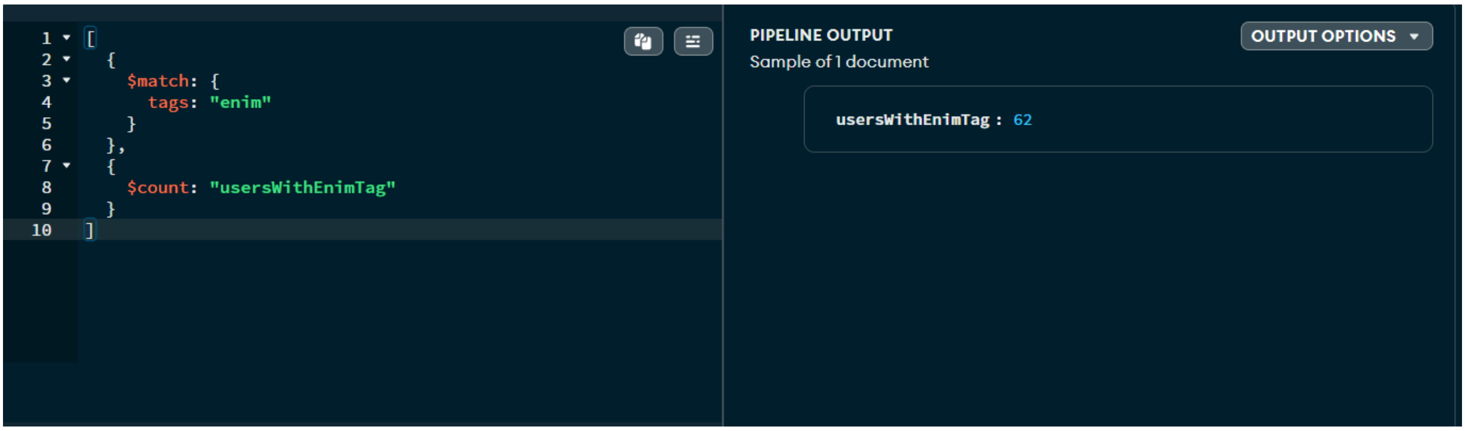
OR



```
[
  {
    $addFields: {
      numberOfTags: {
        $size: {
          $ifNull: ["$tags", []]
        }
      }
    }
  },
  {
    $group: {
      _id: null,
      averageNumberOfTags: {
        $avg: "$numberOfTags"
      }
    }
  }
]
```

```
_id: null
averageNumberOfTags : 3.556
```

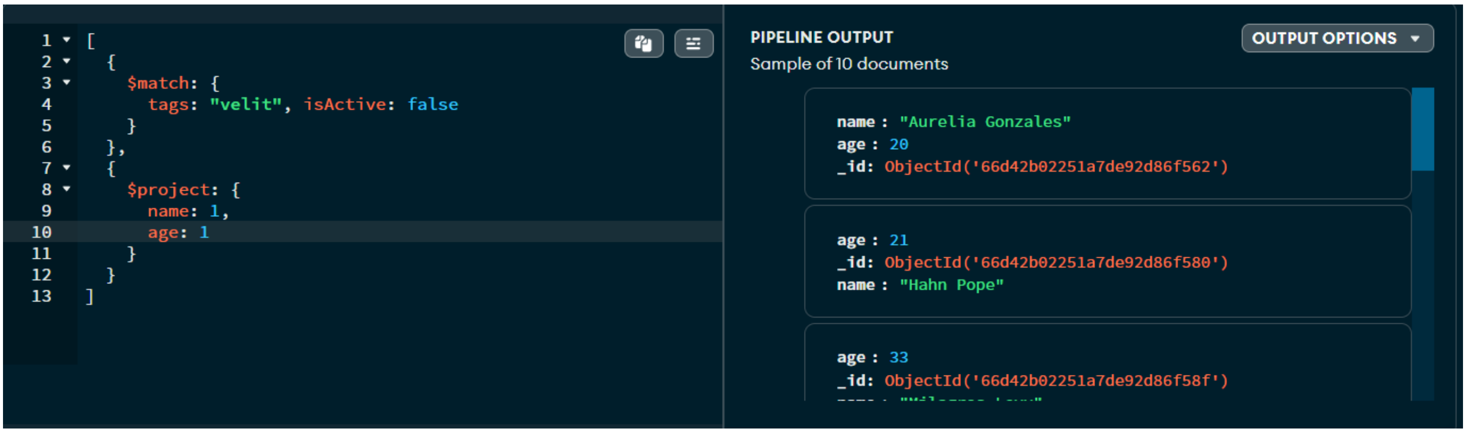
Q7. How many users have ‘enim’ as one of their tags?



```
[
  {
    $match: {
      tags: "enim"
    }
  },
  {
    $count: "usersWithEnimTag"
  }
]
```

```
usersWithEnimTag : 62
```

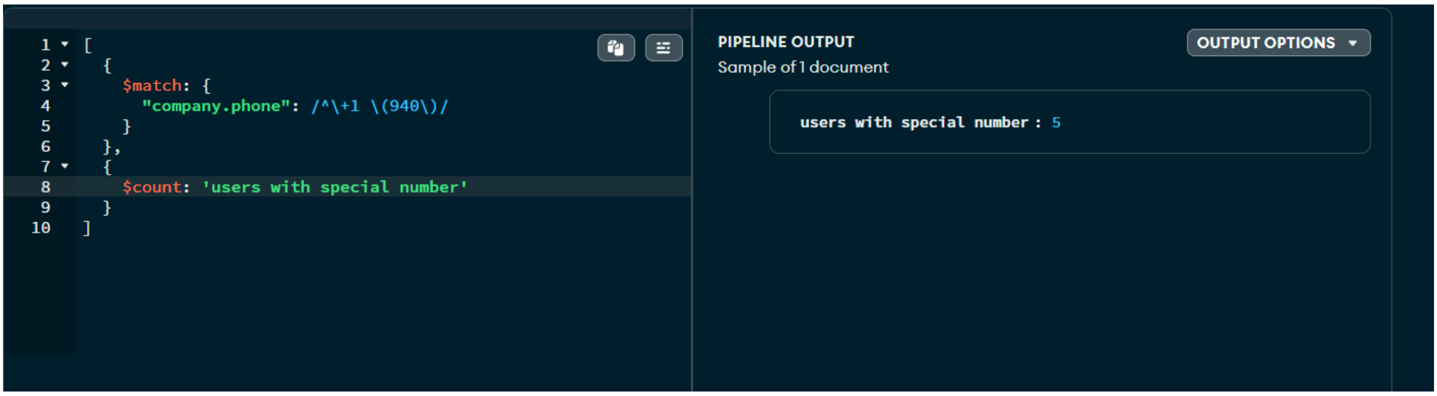
Q8. What are the names and age of the users who are inactive and have ‘velit’ as a tag?



```
[
  {
    $match: {
      tags: "velit", isActive: false
    }
  },
  {
    $project: {
      name: 1,
      age: 1
    }
  }
]
```

```
name : "Aurelia Gonzales"
age : 20
_id: ObjectId('66d42b02251a7de92d86f562')

age : 21
_id: ObjectId('66d42b02251a7de92d86f580')
name : "Hahn Pope"

age : 33
_id: ObjectId('66d42b02251a7de92d86f58f')
```

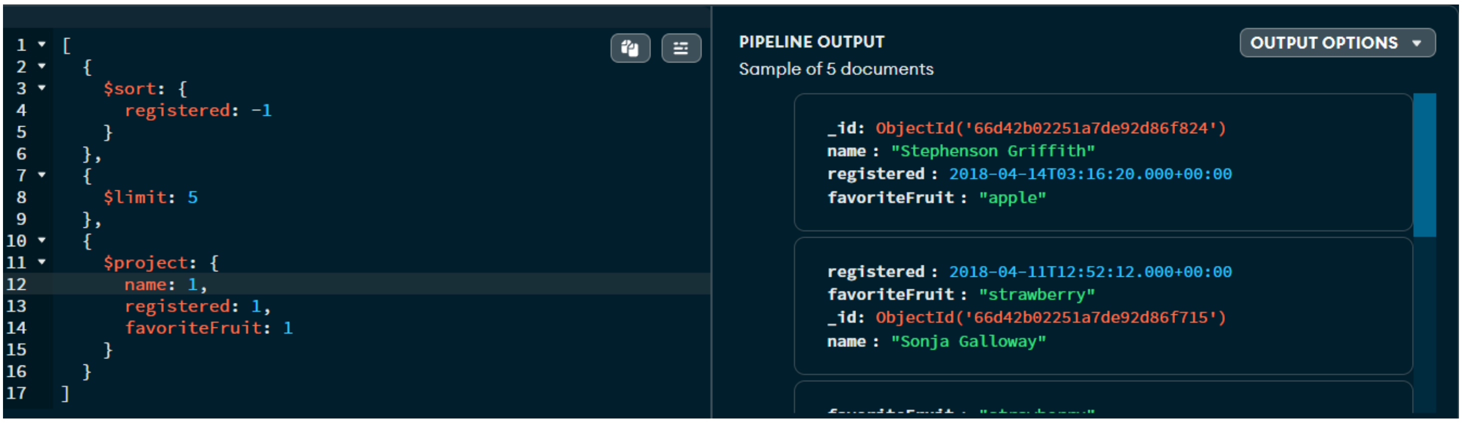
Q9. How many users have a phone number starting with ‘+1 (940)’?



```
[
  {
    $match: {
      "company.phone": /^\+1 \(940\)/
    }
  },
  {
    $count: 'users with special number'
  }
]
```

```
users with special number : 5
```

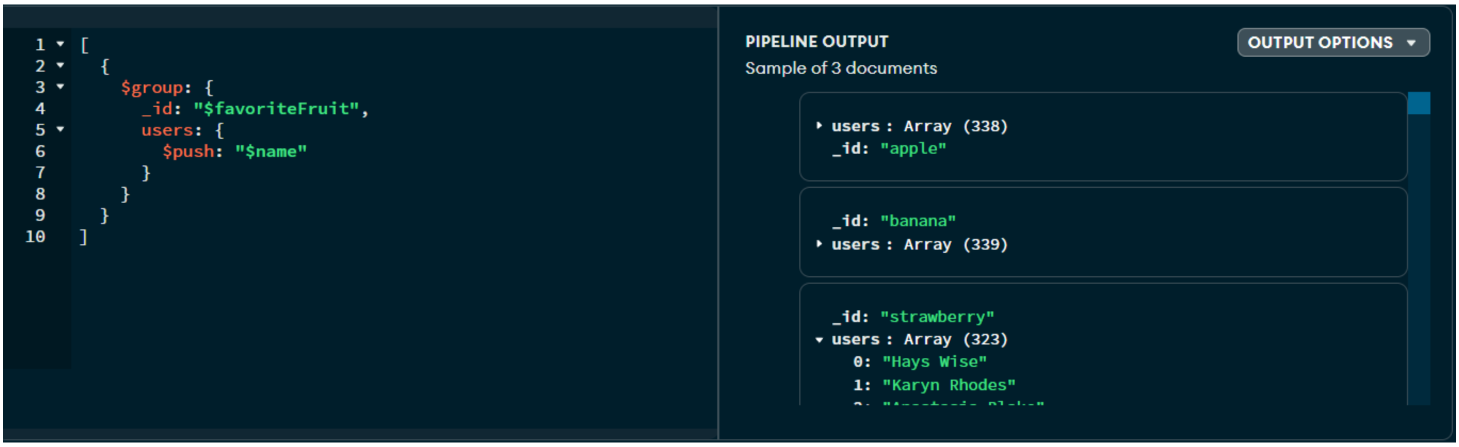
Q10. Find the name, registration date and favorite fruit of 5 most recently registered users.



```
[
  {
    $sort: {
      registered: -1
    }
  },
  {
    $limit: 5
  },
  {
    $project: {
      name: 1,
      registered: 1,
      favoriteFruit: 1
    }
  }
]
```

```
_id: ObjectId('66d42b02251a7de92d86f824')
name : "Stephenson Griffith"
registered : 2018-04-14T03:16:20.000+00:00
favoriteFruit : "apple"

registered : 2018-04-11T12:52:12.000+00:00
favoriteFruit : "strawberry"
_id: ObjectId('66d42b02251a7de92d86f715')
name : "Sonja Galloway"

favoriteFruit : "strawberry"
```

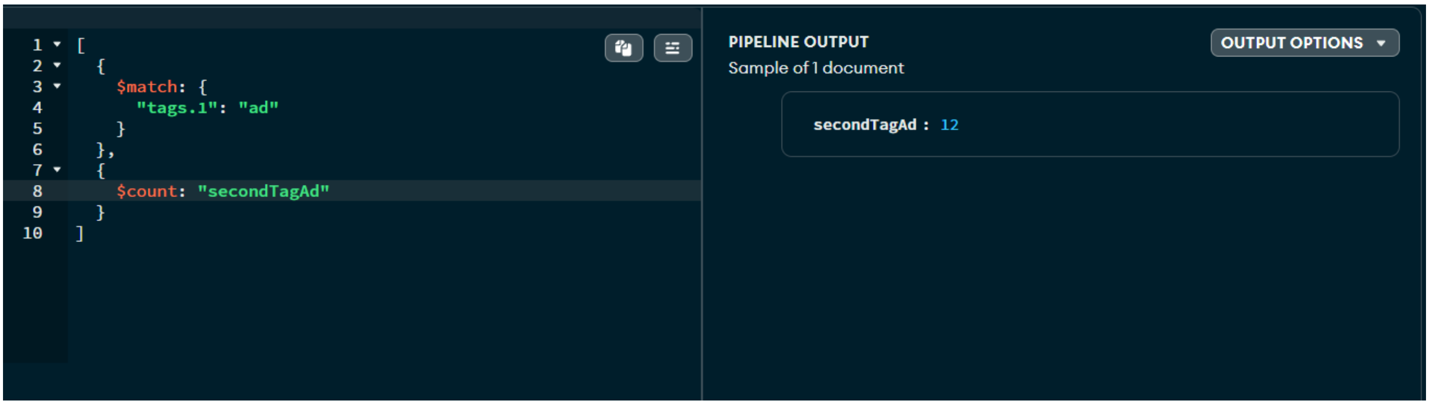
Q11. Categorize users by their favorite fruit.



```
[
  {
    $group: {
      _id: "$favoriteFruit",
      users: {
        $push: "$name"
      }
    }
  }
]
```

```
▸ users : Array (338)
  _id: "apple"

  _id: "banana"
▸ users : Array (339)

  _id: "strawberry"
▾ users : Array (323)
    0: "Hays Wise"
    1: "Karyn Rhodes"
    2: "Anastasia Blake"
```

Q12. How many users have ‘ad’ as their second tag in their list of tags?

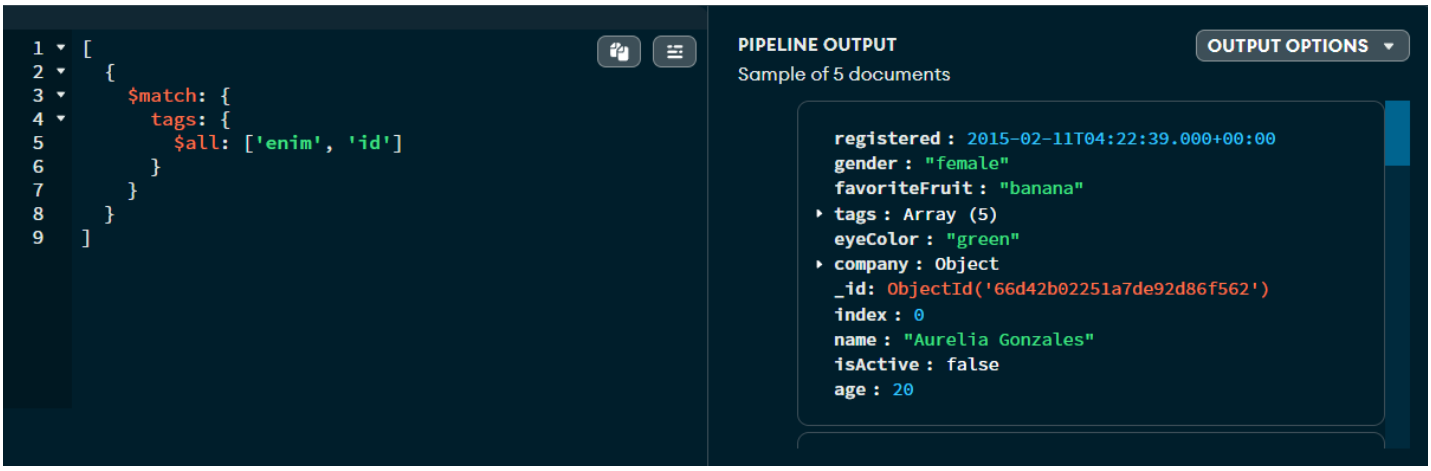


```
[
  {
    $match: {
      "tags.1": "ad"
    }
  },
  {
    $count: "secondTagAd"
  }
]
```

Sample of 1 document

```
secondTagAd : 12
```

Q13. Find users who have both ‘enim’ and ‘id’ in their tags.

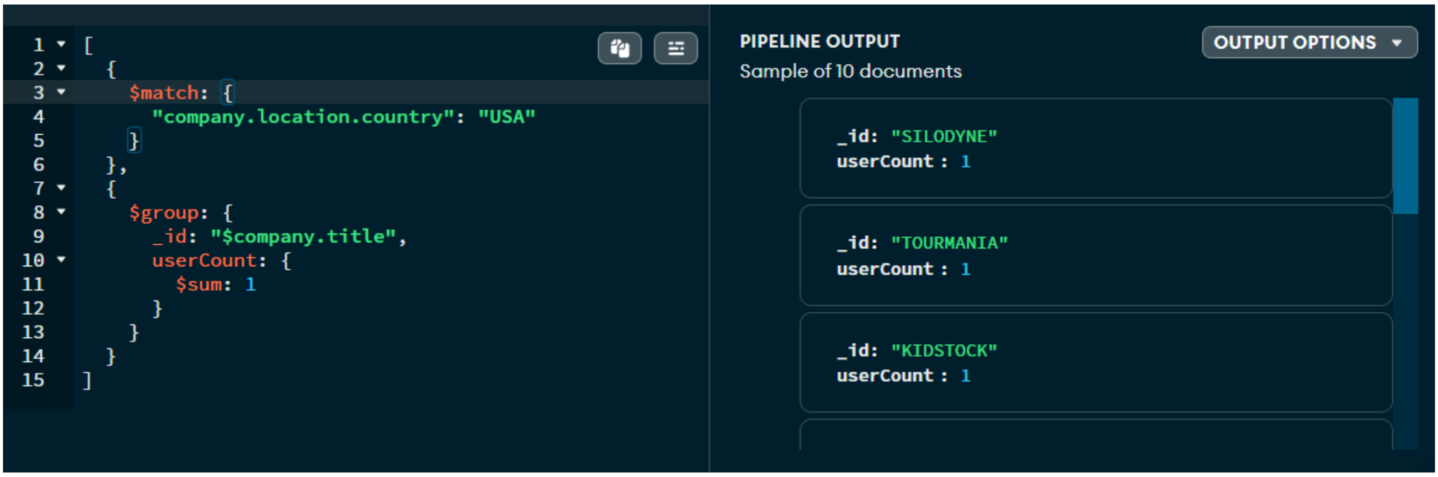


```
[
  {
    $match: {
      tags: {
        $all: ['enim', 'id']
      }
    }
  }
]
```

Sample of 5 documents

```
  registered : 2015-02-11T04:22:39.000+00:00
  gender : "female"
  favoriteFruit : "banana"
▸ tags : Array (5)
  eyeColor : "green"
▸ company : Object
  _id: ObjectId('66d42b02251a7de92d86f562')
  index : 0
  name : "Aurelia Gonzales"
  isActive : false
  age : 20
```

Q14. List all companies located in USA with their corresponding user count.

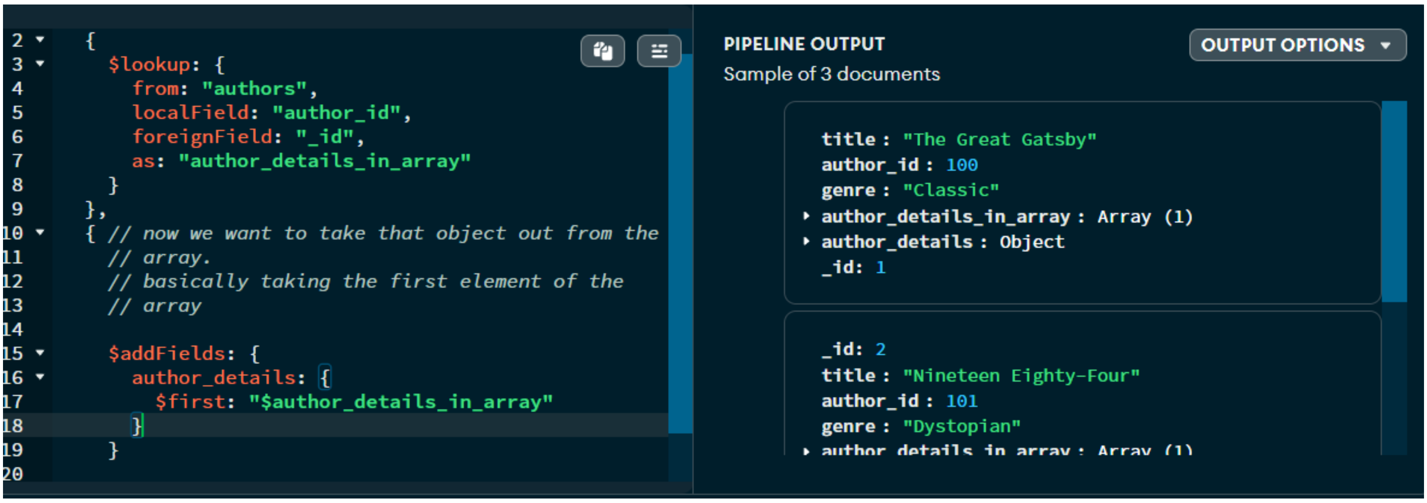


```
[
  {
    $match: {
      "company.location.country": "USA"
    }
  },
  {
    $group: {
      _id: "$company.title",
      userCount: {
        $sum: 1
      }
    }
  }
]
```

Sample of 10 documents

```
_id: "SILODYNE"
userCount : 1

_id: "TOURMANIA"
userCount : 1

_id: "KIDSTOCK"
userCount : 1
```

Q15. Show details of author in books using concept of foreign key.

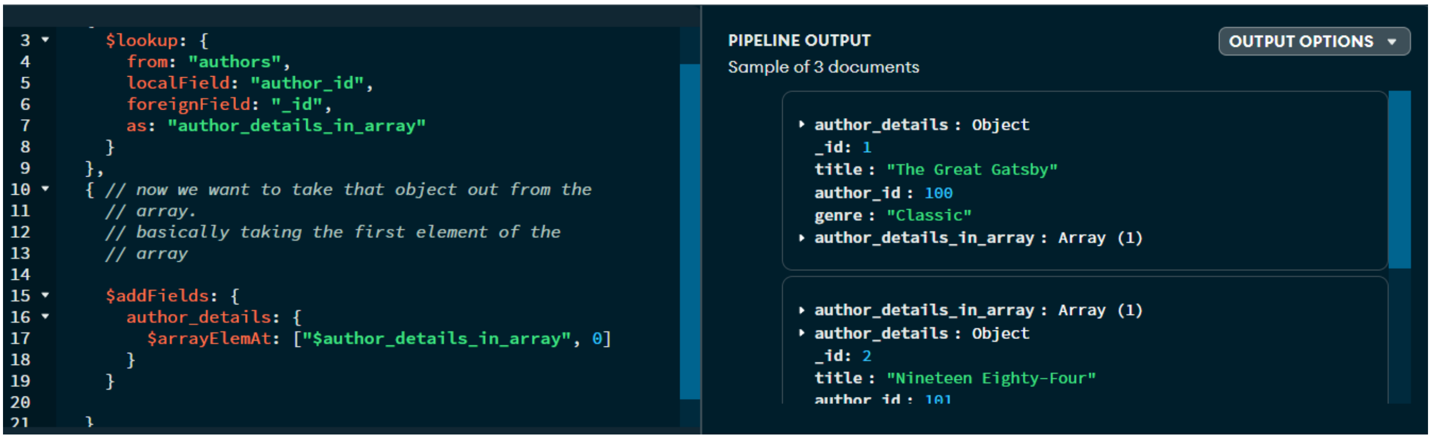


```
  {
    $lookup: {
      from: "authors",
      localField: "author_id",
      foreignField: "_id",
      as: "author_details_in_array"
    }
  },
  { // now we want to take that object out from the
    // array.
    // basically taking the first element of the
    // array

    $addFields: {
      author_details: {
        $first: "$author_details_in_array"
      }
    }

```

Sample of 3 documents

```
title : "The Great Gatsby"
author_id : 100
genre : "Classic"
▸ author_details_in_array : Array (1)
▸ author_details : Object
_id: 1

_id: 2
title : "Nineteen Eighty-Four"
author_id : 101
genre : "Dystopian"
▸ author_details_in_array : Array (1)
```

OR



```
    $lookup: {
      from: "authors",
      localField: "author_id",
      foreignField: "_id",
      as: "author_details_in_array"
    }
  },
  { // now we want to take that object out from the
    // array.
    // basically taking the first element of the
    // array

    $addFields: {
      author_details: {
        $arrayElemAt: ["$author_details_in_array", 0]
      }
    }

  }
```

Sample of 3 documents

```
▸ author_details : Object
_id: 1
title : "The Great Gatsby"
author_id : 100
genre : "Classic"
▸ author_details_in_array : Array (1)

▸ author_details_in_array : Array (1)
▸ author_details : Object
_id: 2
title : "Nineteen Eighty-Four"
author_id : 101
```