Exemple universities
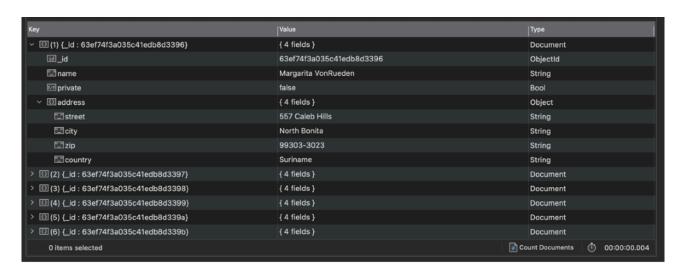
```
1  {
2      _id: ObjectId('63ef74f3a035c41edb8d3396'),
3      name: 'Margarita VonRueden',
4      'private': false,
5      address: {
6          street: '557 Caleb Hills',
7          city: 'North Bonita',
8          zip: '99303-3023',
9          country: 'Suriname'
10     }
11 }
```

Exemple students

```
1  {
2      _id: ObjectId('63ef74f3a035c41edb8d33c8'),
3      firstname: 'Shawn',
4      lastname: 'Goyette',
5      gender: 'male',
6      country: 'Iceland',
7      birthdate: ISODate('2005-01-19T01:09:05.232Z'),
8      scores: [
9          12,
10         10,
11         15,
12         0,
13         4,
14         11,
15         4,
16         16,
17         14,
18         6
19     ],
20     university: {
21         name: 'Candice Hackett',
22         'private': true,
23         address: {
24             street: '427 Flatley Cove',
25             city: 'Machaven',
26             zip: '79663-7540',
27             country: 'United Arab Emirates'
28         },
29         _id: ObjectId('63ef74f3a035c41edb8d33b0')
30     }
31 }
```

1. Affichez la liste des universités.

db.universities.find({})

Key	Value	Type
∨ (1) {_id : 63ef74f3a035c41edb8d3396}	{ 4 fields }	Document
_id	63ef74f3a035c41edb8d3396	ObjectId
name	Margarita VonRueden	String
private	false	Bool
∨ address	{ 4 fields }	Object
street	557 Caleb Hills	String
city	North Bonita	String
zip	99303-3023	String
country	Suriname	String
> (2) {_id : 63ef74f3a035c41edb8d3397}	{ 4 fields }	Document
> (3) {_id : 63ef74f3a035c41edb8d3398}	{ 4 fields }	Document
> (4) {_id : 63ef74f3a035c41edb8d3399}	{ 4 fields }	Document
> (5) {_id : 63ef74f3a035c41edb8d339a}	{ 4 fields }	Document
> (6) {_id : 63ef74f3a035c41edb8d339b}	{ 4 fields }	Document
0 items selected	Count Documents	00:00:00.004

2. Recherchez l'université la plus représentée dans la base de données (selon le nombre d'étudiants associés).
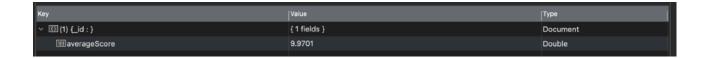db.universities.aggregate([

```
{
  $lookup: {
    from: "students",
    localField: "_id",
    foreignField: "university._id",
    as: "students"
  }
},
{
  $addFields: {
    studentCount: { $size: "$students" }
  }
},
{
  $sort: { studentCount: -1 }
},
{
  $limit: 1
}
])
```

Key	Value	Type
∨ (1) {_id : 63ef74f3a035c41edb8d339f}	{ 6 fields }	Document
_id	63ef74f3a035c41edb8d339f	ObjectId
name	Edwin Blick	String
private	true	Bool
> address	{ 4 fields }	Object
> students	[31 elements]	Array
studentCount	31	Int32

3. Calculez la moyenne générale.
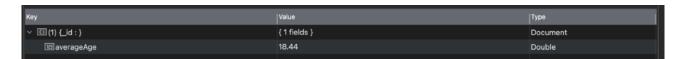db.students.aggregate([

```
{
  $unwind: "$scores"
},
{
  $group: {
    _id: null,
    totalScore: { $sum: "$scores" },
    scoreCount: { $sum: 1 }
  }
},
{
```

```
    $project: {
      _id: 0,
      averageScore: { $divide: ["$totalScore", "$scoreCount"] }
    }
  }
])
```

Key	Value	Type
˅ (1) {_id : }	{ 1 fields }	Document
averageScore	9.9701	Double

4. Calculez l'âge moyen des étudiants.
   db.students.aggregate([

```
  {
    $group: {
      _id: null,
      averageAge: {
        $avg: {
          $divide: [
            { $subtract: [new Date(), "$birthdate"] },
            1000 * 60 * 60 * 24 * 365
          ]
        }
      }
    }
  },
  {
    $project: {
      _id: 0,
      averageAge: { $round: ["$averageAge", 2] }
    }
  }
])
```

Key	Value	Type
˅ (1) {_id : }	{ 1 fields }	Document
averageAge	18.44	Double

5. Calculez le nombre d'étudiants par pays et classez les pays par
   nombre descendant d'étudiants.
   db.students.aggregate([

```
  {
    $group: {
      _id: "$country",
```

```
      studentCount: { $sum: 1 }
    }
  },
  {
    $sort: { studentCount: -1 }
  }
])
```

Key	Value	Type
⌄ (1) {_id : Dominican Republic}	{ 2 fields }	Document
_id	Dominican Republic	String
studentCount	9.0	Double
⌄ (2) {_id : Hong Kong}	{ 2 fields }	Document
_id	Hong Kong	String
studentCount	9.0	Double
> (3) {_id : Colombia}	{ 2 fields }	Document
> (4) {_id : Holy See (Vatican City State)}	{ 2 fields }	Document
> (5) {_id : Slovakia (Slovak Republic)}	{ 2 fields }	Document
> (6) {_id : Bahrain}	{ 2 fields }	Document
> (7) {_id : Virgin Islands, U.S.}	{ 2 fields }	Document
> (8) {_id : Bahamas}	{ 2 fields }	Document
> (9) {_id : Afghanistan}	{ 2 fields }	Document
> (10) {_id : Netherlands Antilles}	{ 2 fields }	Document