

# Bazy Danych - Laboratorium 4

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Zad.2

Tworzenie bazy danych

```
use library
```

Tworzenie kolekcji

```
db.createColleciton("authors")
db.createCollection("books")
```

Dodanie autorów

```
db.authors.insertMany([
  {
    "_id": ObjectId("65711ccdcb2d05e2c973fe85"),
    "name": { "first": "J.R.R", "last": "Tolkien" },
    "country": "UK",
    "birth": new Date("1892-01-03"),
    "death": new Date("1973-09-02")
  },
  {
    "_id": ObjectId("65711ccdcb2d05e2c973fe86"),
    "name": { "first": "Andrzej", "last": "Sapkowski" },
    "country": "Poland",
    "birth": new Date("1948-06-21"),
    "death": null
  },
  {
    "_id": ObjectId("65711ccdcb2d05e2c973fe87"),
    "name": { "first": "Henryk", "last": "Sienkiewicz" },
    "country": "Poland",
    "birth": new Date("1798-12-24"),
    "death": new Date("1855-1-26")
  },
  {
    "_id": ObjectId("65711ccdcb2d05e2c973fe88"),
    "name": { "first": "William", "last": "Shakespear" },
    "country": "UK",
    "birth": new Date("1564-04-26"),
    "death": new Date("1616-04-24")
  }
])
```

```
}  
])
```

## Dodanie książek

```
db.books.insertMany([  
  {  
    "_id": ObjectId("65712008cb2d05e2c973fe86"),  
    "title": "The Hobbit",  
    "isbn": "978-0-261-10295-6",  
    "publication_year": 1937,  
    "language": "English",  
    "author": ObjectId("65711ccdc2d05e2c973fe85"),  
    "publisher":  
      {  
        "name": "George Allen & Unwin",  
        "country": "UK"  
      }  
  },  
  {  
    "_id": ObjectId("65712008cb2d05e2c973fe87"),  
    "title": "The Fellowship of the Ring",  
    "isbn": "978-0-345-33970-6",  
    "publication_year": 1954,  
    "language": "English",  
    "author": ObjectId("65711ccdc2d05e2c973fe85"),  
    "publisher":  
      {  
        "name": "George Allen & Unwin",  
        "country": "UK"  
      }  
  },  
  {  
    "_id": ObjectId("65712008cb2d05e2c973fe88"),  
    "title": "Quo Vadis",  
    "isbn": "978-0-261-10295-6",  
    "publication_year": 1896,  
    "language": "Polish",  
    "author": ObjectId("65711ccdc2d05e2c973fe87"),  
    "publisher":  
      {  
        "name": "Zakład Narodowy im. Ossolińskich",  
        "country": "Poland"  
      }  
  },  
  {  
    "_id": ObjectId("65712008cb2d05e2c973fe89"),  
    "title": "Krzyżacy",  
    "isbn": "978-0-261-10295-6",  
    "publication_year": 1900,  
    "language": "Polish",  
    "author": ObjectId("65711ccdc2d05e2c973fe87"),
```

```
"publisher":
  {
    "name": "Zakład Narodowy im. Ossolińskich",
    "country": "Poland"
  },
{
  "_id": ObjectId("65712008cb2d05e2c973fe90"),
  "title": "Potop",
  "isbn": "978-0-261-10295-6",
  "publication_year": 1886,
  "language": "Polish",
  "author": ObjectId("65711ccdc2d05e2c973fe87"),
  "publisher":
    {
      "name": "Zakład Narodowy im. Ossolińskich",
      "country": "Poland"
    },
{
  "_id": ObjectId("65712008cb2d05e2c973fe91"),
  "title": "Ostatnie Życzenie",
  "isbn": "978-0-575-08244-1",
  "publication_year": 1993,
  "language": "Polish",
  "author": ObjectId("65711ccdc2d05e2c973fe86"),
  "publisher":
    {
      "name": "superNOWA",
      "country": "Poland"
    },
{
  "_id": ObjectId("65712008cb2d05e2c973fe92"),
  "title": "Miecz Przeznaczenia",
  "isbn": "978-1-4732-1153-7",
  "publication_year": 1993,
  "language": "Polish",
  "author": ObjectId("65711ccdc2d05e2c973fe86"),
  "publisher":
    {
      "name": "superNOWA",
      "country": "Poland"
    },
{
  "_id": ObjectId("65712008cb2d05e2c973fe93"),
  "title": "Romeo and Juliet",
  "isbn": "978-0-743-47711-6",
  "publication_year": 1597,
  "language": "English",
  "author": ObjectId("65711ccdc2d05e2c973fe88"),
  "publisher":
    {
```

```

        "name": "Simon & Schuster",
        "country": "UK"
    }
}
])

```

Jak widać na przykładzie wyżej data śmierci może być nullem (Andrzej Sapkowski), poniżej dane z pomyloną nazwą pola i typem oraz pominiętym polem i dodanym nowym.

```

db.authors.insertOne({
  "_id": ObjectId("65711ccdc2d05e2c973fe92"),
  "name": { "first": "William", "last": "Shakespeare" },
  "country": 1,
  "death": new Date("1616-04-24"),
  "british": "true"
})

```

Mongo pozwala nam dodać taki dokument do bazy.

Żeby wymusić poprawność danych możemy użyć JSON schema validation.

```

# usunięcie kolekcji
db.authors.drop()

db.createCollection('authors', {
  validator: {
    $jsonSchema: {
      bsonType: "object",
      required: [ "name", "country", "birth", "death" ],
      properties: {
        name: {
          bsonType: "object",
          required: [ "first", "last" ],
          properties: {
            first: {
              bsonType: "string",
              description: "Must be a string - Required"
            },
            last: {
              bsonType: "string",
              description: "Must be a string - Required"
            }
          }
        },
        country: {
          bsonType: "string",
          description: "Must be a string - Required"
        },
        birth: {
          bsonType: "date",

```

```

        description: "Must be a date - Required"
      },
      death: {
        bsonType: ["null", "date"],
        description: "Must be a date or null - Required"
      }
    }
  }
}
}))

```

Stworzenie kolekcji **reviews**

```

db.createCollection('reviews', {
  validator: {
    $jsonSchema: {
      bsonType: "object",
      required: [ "book", "reviewer", "rating", "text" ],
      properties: {
        book: {
          bsonType: "objectId",
          description: "Must be an id - Required"
        },
        reviewer: {
          bsonType: "string",
          description: "Must be a string - Required"
        },
        rating: {
          bsonType: "int",
          minimum: 1,
          maximum: 5,
          description: "Must be an integer in range 1-5 -
Required"
        },
        text: {
          bsonType: "string",
          description: "Must be a string - Required"
        }
      }
    }
  }
})

```

Dodanie recenzji

```

db.reviews.insertMany([
  {
    "book": ObjectId("65712008cb2d05e2c973fe91"),
    "reviewer": "Jan Kowalski",

```

```

        "rating": 5,
        "text": "Great book!"
    },
    {
        "book": ObjectId("65712008cb2d05e2c973fe91"),
        "reviewer": "Anna Kowalska",
        "rating": 3,
        "text": "Good book."
    },
    {
        "book": ObjectId("65712008cb2d05e2c973fe91"),
        "reviewer": "Adam Nowak",
        "rating": 1,
        "text": "I can't read"
    },
    {
        "book": ObjectId("65712008cb2d05e2c973fe92"),
        "reviewer": "Jan Kowalski",
        "rating": 5,
        "text": "Another great book!"
    },
    {
        "book": ObjectId("65712008cb2d05e2c973fe90"),
        "reviewer": "Jan Kowalski",
        "rating": 2,
        "text": "Not my cup of tea"
    },
    ],
    ])

```

Wybrana przeze mnie metoda pozwala prosto wstawiać i wyszukiwać dane, ale uniemożliwia rozróżnienie recenzentów o tym samym imieniu i nazwisku.

Dodanie tablicy nagród

```
db.authors.updateMany({}, { $set: { awards: [] } })
```

Dodanie tablicy gatunków literackich

```

db.books.updateMany({}, { $set: { genres: [] } })
// Sapkowski
db.books.updateMany(
    { "author": ObjectId("65711ccdc2d05e2c973fe86") },
    { $addToSet: { genres: "Fantasy" } }
)
db.books.updateOne(
    { "_id": ObjectId("65712008cb2d05e2c973fe92") },
    { $addToSet: { genres: "Folklore" } }
)
// Tolkien
db.books.updateMany(

```

```
{ "author": ObjectId("65711ccdc2d05e2c973fe85") },  
  { $addToSet: { genres: "Fantasy" } }  
)
```

### Zad.3

Książki napisane przez Andrzeja Sapkowskiego

```
db.books.find({ "author": db.authors.findOne({ "name.first": "Andrzej",  
"name.last": "Sapkowski" })._id })
```

Polskie książki fantasy

```
db.books.find({ "language": "Polish", "genres": "Fantasy" })
```

Wszystkie książki ze średnią ocen co najmniej 4

```
db.reviews.aggregate([  
  {  
    $group: {  
      _id: "$book",  
      avgRating: { $avg: "$rating" }  
    }  
  },  
  {  
    $match: {  
      avgRating: { $gte: 4 }  
    }  
  },  
  {  
    $project: {  
      _id: 1  
    }  
  }  
])
```

Książki napisane przez polskich autorów

```
db.books.aggregate([  
  {  
    $lookup: {  
      from: "authors",  
      localField: "author",  
      foreignField: "_id",
```

```
        as: "author"
      }
    },
    {
      $unwind: "$author"
    },
    {
      $match: {
        "author.country": "Poland"
      }
    },
    {
      $lookup: {
        from: "reviews",
        localField: "_id",
        foreignField: "book",
        as: "reviews"
      }
    },
    {
      $unwind: "$reviews"
    },
    {
      $group: {
        _id: "$_id",
        title: { $first: "$title" },
        author: { $first: "$author.name" },
        language: { $first: "$language" },
        avgRating: { $avg: "$reviews.rating" },
        publication_year: { $first: "$publication_year" },
        isbn: { $first: "$isbn" },
        publisher: { $first: "$publisher" }
      }
    }
  ]
}
```