Query 1

```
> db.Books.find(
    { Category: "Data Science" },
      { ISBN: 1, Title: 1, _id: 0 }
    )
< {
    ISBN: '978-0133157456',
    Title: 'Python for Data Analysis'
  }
  {
    ISBN: '978-0134190440',
    Title: 'Data Science for Business'
  }
```

Query 2

```
> db.Books.aggregate([
    { $unwind: "$Book_Copies" },
    { $match: { "Book_Copies.Status": "Damaged" } },
    { $group: { _id: "$ISBN" } },
    { $count: "books_with_damaged_copies" }
  ])
< {
    books_with_damaged_copies: 20
  }
```

Query 3

```
> db.Books.find(
    { Category: { $in: ["Programming", "Algorithms"] } },
    { _id: 0, Title: 1, Edition: 1 }
)
< {
    Title: 'The C Programming Language',
    Edition: '2nd'
  }
  {
    Title: 'Introduction to Algorithms',
    Edition: '3rd'
  }
  {
    Title: 'Clean Code',
    Edition: '1st'
  }
  {
    Title: 'Python Crash Course',
    Edition: '2nd'
  }
  {
    Title: 'The Art of Computer Programming',
    Edition: '4th'
  }
  {
    Title: 'Effective Java',
    Edition: '3rd'
  }
  {
    Title: 'Head First Java',
    Edition: '2nd'
  }
```

Query 4

```
> db.Books.find(
    { Price: { $gte: 30, $lte: 50 } },
    { _id: 0, Title: 1 }
)
< {
    Title: 'The C Programming Language'
  }
  {
    Title: 'The Pragmatic Programmer'
  }
  {
    Title: 'Python for Data Analysis'
  }
  {
    Title: 'Clean Code'
  }
  {
    Title: 'Data Science for Business'
  }
  {
    Title: 'Python Crash Course'
  }
  {
    Title: 'Effective Java'
  }
  {
    Title: 'Head First Java'
  }
  {
    Title: 'HTML and CSS: Design and Build Websites'
  }
  {
    Title: 'Learning SQL'
  }
```

Query 5

```
> db.Books.aggregate([
    { $unwind: "$Book_Copies" },
    { $match: { "Book_Copies.Copy#": 1, "Book_Copies.Status": "Damaged" } },
    { $project: { _id: 0, ISBN: 1 } }
  ])
< {
    ISBN: '978-0131103627'
  }
  {
    ISBN: '978-0134190440'
  }
  {
    ISBN: '978-0199535569'
  }
```

Query 6

```
> db.Books.aggregate([
    { $match: { Title: "Learning SQL" } },
    { $unwind: "$Book_Copies" },
    { $match: { "Book_Copies.Status": "Available" } },
    { $count: "available_copies" }
  ])
< {
    available_copies: 3
  }
test>
```

Query 7

```
> db.Books.find(
    { "Book_Copies.Status": { $ne: "Available" } },
    { _id: 0, ISBN: 1 }
)
< {
    ISBN: '978-0134093413'
}
{
    ISBN: '978-0134190440'
}
```

Query 8

```
ISBN: '978-0131101630',
Title: 'The C Programming Language',
totalCopies: 5
}
{
    ISBN: '978-0131103627',
    Title: 'Introduction to Algorithms',
    totalCopies: 7
}
{
    ISBN: '978-0132350884',
    Title: 'The Pragmatic Programmer',
    totalCopies: 7
}
{
    ISBN: '978-0132875527',
    Title: 'Operating System Concepts',
    totalCopies: 6
}
{
    ISBN: '978-0133157456',
    Title: 'Python for Data Analysis',
    totalCopies: 6
}
{
    ISBN: '978-0134093413',
    Title: 'Clean Code',
    totalCopies: 6
}
{
    ISBN: '978-0134190440',
    Title: 'Data Science for Business',
    totalCopies: 6
}
{
    ISBN: '978-0134285190',
    Title: 'Machine Learning Yearning',
    totalCopies: 6
}
```

```
    ISBN: '978-0199535569',
    Title: 'The Art of Computer Programming',
    totalCopies: 7
  }
  {
    ISBN: '978-0201616224',
    Title: 'Design Patterns',
    totalCopies: 8
  }
  {
    ISBN: '978-0201835953',
    Title: 'Code Complete',
    totalCopies: 7
  }
  {
    ISBN: '978-0262033848',
    Title: 'Artificial Intelligence: A Modern Approach',
    totalCopies: 6
  }
  {
    ISBN: '978-0262033849',
    Title: 'Artificial Intelligence: A Modern Approach',
    totalCopies: 6
  }
  {
    ISBN: '978-0321154955',
    Title: 'Refactoring',
    totalCopies: 6
  }
```

```
{
  ISBN: '978-0321751041',
  Title: 'Effective Java',
  totalCopies: 6
}
{
  ISBN: '978-0596009205',
  Title: 'Head First Java',
  totalCopies: 6
}
{
  ISBN: '978-0596517748',
  Title: 'HTML and CSS: Design and Build Websites',
  totalCopies: 7
}
{
  ISBN: '978-1491948971',
  Title: 'JavaScript: The Good Parts',
  totalCopies: 7
}
{
  ISBN: '978-1491950357',
  Title: 'Learning SQL',
  totalCopies: 7
}
```

SQL cmds to Generate Mongodb syntax

SPOOL output.js

SET pagesize 0;

SELECT

'db.Books.insertOne ({ISBN: "' || b.ISBN || '", Title: "' || b.Title || '", Edition: "' || b.Edition || '", Category: "' || b.Category || '", Price: ' || b.Price || ', Book_Copies: [' ||

LISTAGG(

```sql
        '{ "Copy#": ' || bc.Copy# || ', "Status": "' || bc.Status || '" }', ', '
    ) WITHIN GROUP (ORDER BY bc.Copy#) || ' ]});'
FROM books b
JOIN book_copies bc ON b.ISBN = bc.ISBN
GROUP BY b.ISBN, b.Title, b.Edition, b.Category, b.Price;
SPOOL OFF
```

SQL cmds log

SQL> @BookCopies.sql

Table dropped.

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```
db.Books.insertOne ({ISBN: "978-0131101630", Title: "The C Programming Language"
, Edition: "2nd", Category: "Programming", Price: 45.99, Book_Copies: [{ "Copy#"
: 1, "Status": "Available" }, { "Copy#": 2, "Status": "Checked out" }, { "Copy#"
: 3, "Status": "Damaged" }, { "Copy#": 4, "Status": "Available" }, { "Copy#": 5,
 "Status": "Checked out" } ]});


db.Books.insertOne ({ISBN: "978-0131103627", Title: "Introduction to Algorithms"
, Edition: "3rd", Category: "Algorithms", Price: 89.99, Book_Copies: [{ "Copy#":
 1, "Status": "Damaged" }, { "Copy#": 2, "Status": "Available" }, { "Copy#": 3,
"Status": "Checked out" }, { "Copy#": 4, "Status": "Available" }, { "Copy#": 5,
"Status": "Damaged" }, { "Copy#": 6, "Status": "Checked out" }, { "Copy#": 7, "S
tatus": "Available" } ]});


db.Books.insertOne ({ISBN: "978-0132350884", Title: "The Pragmatic Programmer",
Edition: "20th Anniversary", Category: "Software Engineering", Price: 42.5, Book
_Copies: [{ "Copy#": 1, "Status": "Available" }, { "Copy#": 2, "Status": "Checke
```

d out" }, { "Copy#": 3, "Status": "Damaged" }, { "Copy#": 4, "Status": "Availabl

e" }, { "Copy#": 5, "Status": "Available" }, { "Copy#": 6, "Status": "Checked ou

t" }, { "Copy#": 7, "Status": "Damaged" }]});

db.Books.insertOne ({ISBN: "978-0132875527", Title: "Operating System Concepts",

 Edition: "9th", Category: "Systems", Price: 79, Book_Copies: [{ "Copy#": 1, "St

atus": "Available" }, { "Copy#": 2, "Status": "Damaged" }, { "Copy#": 3, "Status

": "Checked out" }, { "Copy#": 4, "Status": "Available" }, { "Copy#": 5, "Status

": "Checked out" }, { "Copy#": 6, "Status": "Available" }]});

db.Books.insertOne ({ISBN: "978-0133157456", Title: "Python for Data Analysis",

Edition: "1st", Category: "Data Science", Price: 42.99, Book_Copies: [{ "Copy#":

 1, "Status": "Available" }, { "Copy#": 2, "Status": "Checked out" }, { "Copy#":

 3, "Status": "Available" }, { "Copy#": 4, "Status": "Damaged" }, { "Copy#": 5,

"Status": "Available" }, { "Copy#": 6, "Status": "Checked out" }]});

db.Books.insertOne ({ISBN: "978-0134093413", Title: "Clean Code", Edition: "1st"

, Category: "Programming", Price: 39.99, Book_Copies: [{ "Copy#": 1, "Status": "

Checked out" }, { "Copy#": 2, "Status": "Checked out" }, { "Copy#": 3, "Status":

 "Checked out" }, { "Copy#": 4, "Status": "Checked out" }, { "Copy#": 5, "Status

": "Checked out" }, { "Copy#": 6, "Status": "Damaged" }]});

db.Books.insertOne ({ISBN: "978-0134190440", Title: "Data Science for Business",

 Edition: "1st", Category: "Data Science", Price: 44.99, Book_Copies: [{ "Copy#"

: 1, "Status": "Damaged" }, { "Copy#": 2, "Status": "Checked out" }, { "Copy#":

3, "Status": "Checked out" }, { "Copy#": 4, "Status": "Checked out" }, { "Copy#"

: 5, "Status": "Checked out" }, { "Copy#": 6, "Status": "Checked out" }]});

```
db.Books.insertOne ({ISBN: "978-0134285190", Title: "Machine Learning Yearning",
 Edition: "1st", Category: "Machine Learning", Price: 12.99, Book_Copies: [{ "Co
py#": 1, "Status": "Checked out" }, { "Copy#": 2, "Status": "Available" }, { "Co
py#": 3, "Status": "Available" }, { "Copy#": 4, "Status": "Damaged" }, { "Copy#"
: 5, "Status": "Checked out" }, { "Copy#": 6, "Status": "Available" } ]});


db.Books.insertOne ({ISBN: "978-0135957059", Title: "Python Crash Course", Editi
on: "2nd", Category: "Programming", Price: 38.99, Book_Copies: [{ "Copy#": 1, "S
tatus": "Available" }, { "Copy#": 2, "Status": "Checked out" }, { "Copy#": 3, "S
tatus": "Available" }, { "Copy#": 4, "Status": "Damaged" }, { "Copy#": 5, "Statu
s": "Checked out" }, { "Copy#": 6, "Status": "Available" }, { "Copy#": 7, "Statu
s": "Damaged" } ]});


db.Books.insertOne ({ISBN: "978-0199535569", Title: "The Art of Computer Program
ming", Edition: "4th", Category: "Algorithms", Price: 199.99, Book_Copies: [{ "C
opy#": 1, "Status": "Damaged" }, { "Copy#": 2, "Status": "Checked out" }, { "Cop
y#": 3, "Status": "Available" }, { "Copy#": 4, "Status": "Available" }, { "Copy#
": 5, "Status": "Checked out" }, { "Copy#": 6, "Status": "Available" }, { "Copy#
": 7, "Status": "Damaged" } ]});


db.Books.insertOne ({ISBN: "978-0201616224", Title: "Design Patterns", Edition:
"1st", Category: "Software Engineering", Price: 58, Book_Copies: [{ "Copy#": 1,
"Status": "Available" }, { "Copy#": 2, "Status": "Checked out" }, { "Copy#": 3,
"Status": "Damaged" }, { "Copy#": 4, "Status": "Available" }, { "Copy#": 5, "Sta
tus": "Available" }, { "Copy#": 6, "Status": "Checked out" }, { "Copy#": 7, "Sta
tus": "Available" }, { "Copy#": 8, "Status": "Damaged" } ]});
```

```
db.Books.insertOne ({ISBN: "978-0201835953", Title: "Code Complete", Edition: "2
nd", Category: "Software Engineering", Price: 59.99, Book_Copies: [{ "Copy#": 1,
 "Status": "Checked out" }, { "Copy#": 2, "Status": "Available" }, { "Copy#": 3,
 "Status": "Damaged" }, { "Copy#": 4, "Status": "Available" }, { "Copy#": 5, "St
atus": "Checked out" }, { "Copy#": 6, "Status": "Available" }, { "Copy#": 7, "St
atus": "Damaged" } ]});


db.Books.insertOne ({ISBN: "978-0262033848", Title: "Artificial Intelligence: A
Modern Approach", Edition: "3rd", Category: "Artificial Intelligence", Price: 10
9.99, Book_Copies: [{ "Copy#": 1, "Status": "Available" }, { "Copy#": 2, "Status
": "Checked out" }, { "Copy#": 3, "Status": "Damaged" }, { "Copy#": 4, "Status":
 "Available" }, { "Copy#": 5, "Status": "Checked out" }, { "Copy#": 6, "Status":
 "Damaged" } ]});


db.Books.insertOne ({ISBN: "978-0262033849", Title: "Artificial Intelligence: A
Modern Approach", Edition: "3rd", Category: "AI", Price: 109.99, Book_Copies: [{
 "Copy#": 1, "Status": "Available" }, { "Copy#": 2, "Status": "Checked out" }, {
 "Copy#": 3, "Status": "Available" }, { "Copy#": 4, "Status": "Damaged" }, { "Co
py#": 5, "Status": "Damaged" }, { "Copy#": 6, "Status": "Available" } ]});


db.Books.insertOne ({ISBN: "978-0321154955", Title: "Refactoring", Edition: "2nd
", Category: "Software Engineering", Price: 55, Book_Copies: [{ "Copy#": 1, "Sta
tus": "Checked out" }, { "Copy#": 2, "Status": "Available" }, { "Copy#": 3, "Sta
tus": "Available" }, { "Copy#": 4, "Status": "Damaged" }, { "Copy#": 5, "Status"
: "Available" }, { "Copy#": 6, "Status": "Checked out" } ]});
```

```
db.Books.insertOne ({ISBN: "978-0321751041", Title: "Effective Java", Edition: "
3rd", Category: "Programming", Price: 49.99, Book_Copies: [{ "Copy#": 1, "Status
": "Available" }, { "Copy#": 2, "Status": "Damaged" }, { "Copy#": 3, "Status": "
Checked out" }, { "Copy#": 4, "Status": "Available" }, { "Copy#": 5, "Status": "
Damaged" }, { "Copy#": 6, "Status": "Available" } ]});


db.Books.insertOne ({ISBN: "978-0596009205", Title: "Head First Java", Edition:
"2nd", Category: "Programming", Price: 34.99, Book_Copies: [{ "Copy#": 1, "Statu
s": "Checked out" }, { "Copy#": 2, "Status": "Available" }, { "Copy#": 3, "Statu
s": "Checked out" }, { "Copy#": 4, "Status": "Available" }, { "Copy#": 5, "Statu
s": "Damaged" }, { "Copy#": 6, "Status": "Available" } ]});


db.Books.insertOne ({ISBN: "978-0596517748", Title: "HTML and CSS: Design and Bu
ild Websites", Edition: "1st", Category: "Web Development", Price: 32.99, Book_C
opies: [{ "Copy#": 1, "Status": "Checked out" }, { "Copy#": 2, "Status": "Availa
ble" }, { "Copy#": 3, "Status": "Damaged" }, { "Copy#": 4, "Status": "Available"
 }, { "Copy#": 5, "Status": "Checked out" }, { "Copy#": 6, "Status": "Damaged" }
, { "Copy#": 7, "Status": "Available" } ]});


db.Books.insertOne ({ISBN: "978-1491948971", Title: "JavaScript: The Good Parts"
, Edition: "1st", Category: "Web Development", Price: 23.99, Book_Copies: [{ "Co
py#": 1, "Status": "Available" }, { "Copy#": 2, "Status": "Checked out" }, { "Co
py#": 3, "Status": "Available" }, { "Copy#": 4, "Status": "Damaged" }, { "Copy#"
: 5, "Status": "Available" }, { "Copy#": 6, "Status": "Checked out" }, { "Copy#"
: 7, "Status": "Available" } ]});


db.Books.insertOne ({ISBN: "978-1491950357", Title: "Learning SQL", Edition: "2n
```

d", Category: "Database", Price: 40, Book_Copies: [{ "Copy#": 1, "Status": "Available" }, { "Copy#": 2, "Status": "Damaged" }, { "Copy#": 3, "Status": "Checked out" }, { "Copy#": 4, "Status": "Available" }, { "Copy#": 5, "Status": "Checked out" }, { "Copy#": 6, "Status": "Available" }, { "Copy#": 7, "Status": "Damaged" }]});

20 rows selected.

Mongodb count cmds

```
> db.Books.count();
< 20
> db.Books.aggregate([
    { $unwind: "$Book_Copies" },  // Unwind the Book_Copies array
    { $group: { _id: null, tcount: { $sum: 1 } } },  // Count all the Book_Copies
    { $project: { _id: 0, tcount: 1 } }  // Omit the _id field from the result
  ])
< {
    tcount: 129
  }
test>|
```