DSA5104 Practice - MongoDB

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Questions

Questions covering basic concepts in mongosh generated by ChatGPT for practice. Please pull the sample data file from Github page as well. The colection for the following questions will be *db/inventory*. Question 14-16 will change the database and the database needs to be restored suppose the query were problematic.

1. List all unique item names.

2. Find all items stored in warehouse A with quantity over 20. Project and return the item name only without object id.

3. Return the `item` and `uom` (unit of measure) for all items whose width is greater than 20.

4. List items whose status is "A" and that have more than one warehouse entry. Project and return the item name only without object id.

5. Find the total stock quantity for each item. Return results as "{item}:{total}" sorted descending.

6. Find items where any warehouse reports quantity less than 10.

7. Return the names of items whose height is between 10 and 15 (inclusive).

8. Using array queries: list items that contain a warehouse "C" entry with quantity > 20.

9. For each warehouse (A, B, C, D), return the total number of units stored there, sorted in ascending order of total.

10. List items where the first `instock` entry has quantity ≥ 30.

11. Count how many items use the "cm" unit of measure.

12. Find items that do not contain a "size" field (if any).

13. Text search: create a text index on `item`.

14. Update query: increase all quantities in warehouse A by 5.

15. Replace an entire document: replace the record of "journal" with a new structure including a "category" field.

16. Delete all items with status = "D" and quantity < 10 across any warehouse.

Answers

1. **Query:**

```
db.inventory.distinct("item");
```

Output:

```
[
  'binder',      'canvas',
  'envelope',    'folder',
  'journal',     'marker',
  'notebook',    'paper',
  'planner',     'postcard',
  'sketchbook'
]
```

2. **Query:**

```
db.inventory.find({
  "instock.warehouse": "A",
  "instock.qty": { $gt: 20 }
}, {_id: 0, item: 1}))
```

Output:

```
{
  item: 'paper'
}
{
  item: 'planner'
}
{
  item: 'binder'
}
```

3. **Query:**

```
db.inventory.find(
  { "size.w": { $gt: 20 } },
  { item:1, "size.uom":1, _id:0 }
)
```

Output:

```
{
  item: 'journal',
  size: {
    uom: 'cm'
  }
}
{
  item: 'planner',
  size: {
    uom: 'cm'
  }
}
{
  item: 'binder',
```

```
    size: {
      uom: 'cm'
    }
}
{
  item: 'canvas',
  size: {
    uom: 'cm'
  }
}
{
  item: 'folder',
  size: {
    uom: 'cm'
  }
}
```

4. **Query:**

```
db.inventory.find({
  status: "A",
  "instock.1": { $exists: true }
}, {_id: 0, item: 1})
```

Output:

```
{
  item: 'paper'
}
{
  item: 'planner'
}
{
  item: 'binder'
}
```

5. **Query:**

```
db.inventory.aggregate([
  { $unwind:"$instock" },
  { $group:{ _id:"$item", total:{ $sum:"$instock.qty" } }},
  { $sort:{ total:-1 }}
])
```

Output:

```
{
  _id: 'marker',
  total: 100
}
{
  _id: 'paper',
  total: 60
}
{
  _id: 'postcard',
  total: 50
}
```

```
{
  _id: 'envelope',
  total: 50
}
{
  _id: 'binder',
  total: 40
}
{
  _id: 'planner',
  total: 40
}
{
  _id: 'folder',
  total: 20
}
{
  _id: 'sketchbook',
  total: 20
}
{
  _id: 'journal',
  total: 5
}
{
  _id: 'notebook',
  total: 5
}
{
  _id: 'canvas',
  total: 3
}
```

6. **Query:**

```
db.inventory.find({
  instock:{ $elemMatch:{ qty:{ $lt:10 } } } }
}, {_id: 0, item: 1})
```

Output:

```
{
  item: 'journal'
}
{
  item: 'notebook'
}
{
  item: 'canvas'
}
{
  item: 'folder'
}
```

7. **Query:**

```
db.inventory.find({
  "size.h":{ $gte:10, $lte:15 }
}, {_id: 0, item: 1})
```

Output:

```
{
  item: 'journal'
}
{
  item: 'postcard'
}
{
  item: 'sketchbook'
}
```

8. **Query:**

```
db.inventory.find({
  instock:{
    $elemMatch:{ warehouse:"C", qty:{ $gt:20 } }
  }
}, {_id: 0, item: 1})
```

Output:

```
{
  item: 'postcard'
}
{
  item: 'envelope'
}
```

9. **Query:**

```
db.inventory.aggregate([
  { $unwind:"$instock" },
  { $group:{ _id:"$instock.warehouse",
             total:{ $sum:"$instock.qty" } }},
  { $sort: { total: 1 }}
])
```

Output:

```
{
  _id: 'D',
  total: 31
}
{
  _id: 'C',
  total: 102
}
{
  _id: 'A',
  total: 125
}
{
  _id: 'B',
  total: 135
}
```

10. **Query:**

```
db.inventory.find({
  "instock.0.qty": { $gte: 30 }
}, {_id: 0, item: 1})
```

Output:

```
{
  item: 'paper'
}
{
  item: 'planner'
}
{
  item: 'envelope'
}
{
  item: 'marker'
}
```

11. **Query:**

```
db.inventory.countDocuments({ "size.uom": "cm" })
```

Output:

```
8
```

12. **Query:**

```
db.inventory.find({ size:{ $exists:false } }, {_id: 0, item: 1})
```

Output:

```
{
  item: 'marker'
}
```

13. **Query:**

```
db.inventory.createIndex({ item:"text" })
```

Output:

```
item_text
```

14. **Query:**

```
db.inventory.updateMany(
  { "instock.warehouse":"A" },
  { $inc:{ "instock.$.qty":5 } }
)
```

Output:

```
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 5,
  modifiedCount: 5,
  upsertedCount: 0
}
```

15. **Query:**

```
db.inventory.replaceOne(
  { item:"journal" },
  {
    item:"journal",
    category:"writing",
    status:"A",
    size:{ h:14, w:21, uom:"cm" },
    instock:[{ warehouse:"A", qty:5 }]
  }
)
```

Output:

```
{
  acknowledged: true,
  insertedId: null,
  matchedCount: 1,
  modifiedCount: 1,
  upsertedCount: 0
}
```

16. **Query:**

```
db.inventory.deleteMany({
  status:"D",
  instock:{ $elemMatch:{ qty:{ $lt:10 } } } }
})
```

Output:

```
{
  acknowledged: true,
  deletedCount: 1
}
```