DASC 5333 Database Systems for Data Science
CSCI 4333 Design of Database Systems
Fall 2023
Homework #8

Simple MongoDB Assignment

Create the 'toyu' database in MongoDB.

[1] Download the file: toyu-db.gz.
[2] Ensure that you have download MongoDB tools: command line utilities including import and export, https://www.mongodb.com/try/download/database-tools.
[3] Run the command: mongorestore --archive="toyu-db.gz" --gzip --nsFrom='toyu.*' --nsTo='toyu.*'

Note that the design of toyu is not the typical way one would design a MongoDB. Instead, it is intended to look like the toyu MySQL database for ease of comparison.

Construct JS code *that works inside Mongosh* for the following data problem. Use mongosh to test your solution. Do you develop standalone Node JS program Put your solution in a JS file (such as h8sol.js) and turn it in through Blackboard. It may be necessary for you to add a .txt extension (such as h8sol.js.txt). The TA will execute your .js submission.

[1] Show the information of all students with the last name 'Hawk' and majoring in 'CSCI' in JSON in the following manner.

```
[
  { stuId: 100000, fname: 'Tony', lname: 'Hawk', major: 'CSCI' },
  { stuId: 100001, fname: 'Mary', lname: 'Hawk', major: 'CSCI' },
  { stuId: 100002, fname: 'David', lname: 'Hawk', major: 'CSCI' }
]
```

[2] Show all information of all students with the last name ('Hawk' or 'Johnson) and majoring in ('CSCI' or 'CINF') in JSON in the following manner.

```
[
  { stuId: 100000, fname: 'Tony', lname: 'Hawk', major: 'CSCI' },
  { stuId: 100001, fname: 'Mary', lname: 'Hawk', major: 'CSCI' },
  { stuId: 100002, fname: 'David', lname: 'Hawk', major: 'CSCI' },
  { stuId: 100005, fname: 'Linda', lname: 'Johnson', major: 'CINF' },
  { stuId: 100006, fname: 'Lillian', lname: 'Johnson', major: 'CINF' }
]
```

[3] Show the deptcode of all departments and the number of faculty members in the departments in JSON in the following manner.

```
[
  { 'department code': 'CSCI', 'number of faculty': 4 },
  { 'department code': 'ENGL', 'number of faculty': 1 },
```

```
  { 'department code': 'ARTS', 'number of faculty': 1 },
  { 'department code': 'CINF', 'number of faculty': 2 },
  { 'department code': 'ITEC', 'number of faculty': 2 },
  { 'department code': 'ACCT', 'number of faculty': 1 }
]
```

[4] Repeat [3] but show only those departments with 2 or more faculty. Show the result in descending order of number of faculty in JSON in the following manner.

```
[
  { 'department code': 'CSCI', 'number of faculty': 4 },
  { 'department code': 'CINF', 'number of faculty': 2 },
  { 'department code': 'ITEC', 'number of faculty': 2 }
]
```

[5] Repeat [4] except that the result is shown in textual format with the department names, code, number of faculty, and number of staff in the following manner. Be mindful of details and order.

```
  [1]  Computer Information Systems (CINF): number of faculty 2; number of staff 5
  [2]  Information Technology (ITEC): number of faculty 2; number of staff 4
  [3]  Computer Science (CSCI): number of faculty 4; number of staff 12
```