Database Systems
Spring 2026
Homework #8

Simple MongoDB Assignment

Create the 'toyu' database in MongoDB.

[1] Download the file: ../notes/toyu/toyu-db.gz. Do not unzip.
[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 in a terminal that contains toyu-db.gz:

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 problems. Use mongosh to test your solution. Do not develop standalone Node JS program. Put your solution in a JS file (such as h8sol.js) and turn it in through Canvas. It may be necessary for you to add a .txt extension (such as h8sol.js.txt). The TA will execute your .js submission in Mongosh.

[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] (Bonus: 20%) 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
```