

**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](http://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 problems. 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 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 departments with six or more staffs in JSON format in the following manner.

```
[
  {
    deptCode: 'ACCT',
    'department name': 'Accounting',
    'number of staff': 10
  },
  {
    deptCode: 'CSCI',
    'department name': 'Computer Science',
    'number of staff': 12
  },
  {
    deptCode: 'ENGL',
    'department name': 'English',
    'number of staff': 12
  },
  {
    deptCode: 'MATH',
    'department name': 'Mathematics',
    'number of staff': 7
  }
]
```

- [2] Redo [1] and output in regular string in the following manner in the final result.

- [1] Accounting (Accounting): in the college BUS with 10 staff.
- [2] Computer Science (Computer Science): in the college CSE with 12 staff.
- [3] English (English): in the college HSH with 12 staff.
- [4] Mathematics (Mathematics): in the college CSE with 7 staff.

**[3] Show the schoolcode of all schools with their number and names of departments in JSON in the following manner.**

```
[
  {
    departments: [
      'Computer Information Systems',
      'Computer Science',
      'Information Technology',
      'Mathematics'
    ],
    'school code': 'CSE',
    'number of departments': 4
  },
  {
    departments: [ 'Accounting' ],
    'school code': 'BUS',
    'number of departments': 1
  },
  {
    departments: [ 'Arts', 'English' ],
    'school code': 'HSH',
    'number of departments': 2
  }
]
```

**[4] Show department information in the JSON string format in the following manner. List only those departments in the school "HSH" or "CSE" and with a number of staff of 5 or more.**

```
[
  { schoolCode: 'HSH', numStaff: 5, department: 'Arts (ARTS)' },
  {
    schoolCode: 'CSE',
    numStaff: 5,
    department: 'Computer Information Systems (CINF)'
  },
  {
    schoolCode: 'CSE',
    numStaff: 12,
    department: 'Computer Science (CSCI)'
  },
  { schoolCode: 'HSH', numStaff: 12, department: 'English (ENGL)' },
  { schoolCode: 'CSE', numStaff: 7, department: 'Mathematics (MATH)' }
]
```

**[5] (Bonus 20%) Repeat [3], but show the final result in regular string the following manner.**

School HSH (Human Sciences and Humanities) has 2 departments: Arts, English  
 School CSE (Science and Engineering) has 4 departments: Computer Information Systems, Computer Science, Information Technology, Mathematics