

DASC 5333 Database Systems for Data Science
CSCI 4333 Design of Database Systems
Fall 2024
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 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 a faculty advisor in the following manner.

```
[
  {
    stuId: 100000,
    fname: 'Tony',
    lname: 'Hawk',
    major: 'CSCI',
    minor: 'CINF',
    advisor: 1011
  },
  {
    stuId: 100001,
    fname: 'Mary',
    lname: 'Hawk',
    major: 'CSCI',
    minor: 'CINF',
    advisor: 1011
  },
  {
    stuId: 100002,
    fname: 'David',
    lname: 'Hawk',
    major: 'CSCI',
    minor: 'ITEC',
    advisor: 1012
  },
]
```

```

{
  stuId: 100004,
  fname: 'Larry',
  lname: 'Johnson',
  major: 'ITEC',
  minor: null,
  advisor: 1017
},
{
  stuId: 100005,
  fname: 'Linda',
  lname: 'Johnson',
  major: 'CINF',
  minor: 'ENGL',
  advisor: 1015
},
{
  stuId: 100006,
  fname: 'Lillian',
  lname: 'Johnson',
  major: 'CINF',
  minor: 'ITEC',
  advisor: 1016
},
{
  stuId: 100009,
  fname: 'Linda',
  lname: 'King',
  major: 'ARTS',
  minor: 'CSCI',
  advisor: 1018
},
{
  stuId: 100111,
  fname: 'Cathy',
  lname: 'Johanson',
  major: null,
  minor: null,
  advisor: 1018
}
]

```

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

```

[1] Tony Hawk (100000) -> major: CSCI; minor: CINF; advisor: 1011.
[2] Mary Hawk (100001) -> major: CSCI; minor: CINF; advisor: 1011.
[3] David Hawk (100002) -> major: CSCI; minor: ITEC; advisor: 1012.
[4] Larry Johnson (100004) -> major: ITEC; minor: null; advisor: 1017.
[5] Linda Johnson (100005) -> major: CINF; minor: ENGL; advisor: 1015.
[6] Lillian Johnson (100006) -> major: CINF; minor: ITEC; advisor: 1016.
[7] Linda King (100009) -> major: ARTS; minor: CSCI; advisor: 1018.
[8] Cathy Johanson (100111) -> major: null; minor: null; advisor: 1018.

```

[3] Show the names of students majoring in CSCI, CINF or ITEC in the following manners.

```

[
  { major: 'CSCI', student: 'Tony Hawk', 'advisor facId': 1011 },
  { major: 'CSCI', student: 'Mary Hawk', 'advisor facId': 1011 },
  { major: 'CSCI', student: 'David Hawk', 'advisor facId': 1012 },
  { major: 'ITEC', student: 'Catherine Lim', 'advisor facId': null },

```

```
{ major: 'ITEC', student: 'Larry Johnson', 'advisor facId': 1017 },
{ major: 'CINF', student: 'Linda Johnson', 'advisor facId': 1015 },
{ major: 'CINF', student: 'Lillian Johnson', 'advisor facId': 1016 }
]
```

[4] List the information of all students as a textual report in the following manner. Note that the result appears in the order of major, with undeclared major (null in the field major) comes first. Note also the use of "none" for advisor.

```
Ben Zico (100007) => major: undeclared; advisor: none.
Cathy Johanson (100111) => major: undeclared; advisor: Art Allister.
Bill Ching (100008) => major: ARTS; advisor: none.
Linda King (100009) => major: ARTS; advisor: Art Allister.
Linda Johnson (100005) => major: CINF; advisor: Daniel Kim.
Lillian Johnson (100006) => major: CINF; advisor: Andrew Byre.
Tony Hawk (100000) => major: CSCI; advisor: Paul Smith.
Mary Hawk (100001) => major: CSCI; advisor: Paul Smith.
David Hawk (100002) => major: CSCI; advisor: Mary Tran.
Catherine Lim (100003) => major: ITEC; advisor: none.
Larry Johnson (100004) => major: ITEC; advisor: Deborah Gump.
```

[5] Show the student id and the number of classes enrolled with a passing grade: A, A-, B+, B, B- or C+ in the following manner.

```
[
  { student_id: 100004, 'number of passed courses': 2 },
  { student_id: 100007, 'number of passed courses': 1 },
  { student_id: 100001, 'number of passed courses': 1 },
  { student_id: 100005, 'number of passed courses': 3 },
  { student_id: 100000, 'number of passed courses': 4 },
  { student_id: 100002, 'number of passed courses': 2 },
  { student_id: 100006, 'number of passed courses': 2 }
]
```