Assignment 3

CSIS 3300-001

Due date: April 3, 2019 (8:59 PM)

(15 marks in total, 5% toward your final grade)

Q1. XML and JSON conversion (Do not use an online converter) 4 marks

a. Convert the following JSON format content into XML format and plot the tree structure

```
{
    "menu": {
            "id": "file",
            "value": "File",
            "popup": {
                "menuitem": [
                        {"value": "New", "onclick": "CreateNewDoc()"},
                        {"value": "Open", "onclick": "OpenDoc()"},
                        {"value": "Close", "onclick": "CloseDoc()"}
                ]
            }
    }
}
```

b. Convert the following XML format content into JSON format.

```
<configuration-file>
    <section name="section1">
            <entry name="name1" value="value1"/>
            <entry name="name2" value="value2"/>
    </section>
    <section name="section2">
            <entry name="someothername" value="someothervalue"/>
     </section>
</configuration-file>
```

Q2. Create a hash index on the instructors' name (the second column) for the following instructor table. To obtain the hash value of each key, we use the decimal ASCII code of each character (see https://www.asciitable.com/, pay attention to upper/lowercase and space) (The hash function computes the sum of the ASCII codes of the name and modulo 4. The hash index has 4 buckets, each of size 3. Refer to the Figure 11.25 in the textbook as an example, which creates a hash index on ID. In your answer, please give the sum of the ASCII codes of each instructor's name, compute the hash value, and plot the hash index structure in the same way as Figure 11.25 in the textbook. (6 marks)

76766	Crick	Biology	72000
10101	Srinivasan	Comp. Sci.	65000
45565	Katz	Comp. Sci.	75000
83821	Brandt	Comp. Sci.	92000
98345	Kim	Elec. Eng.	80000
12121	Wu	Finance	90000
76543	Singh	Finance	80000
32343	El Said	History	60000
58583	Califieri	History	62000
15151	Mozart	Music	40000
22222	Einstein	Physics	95000
33465	Gold	Physics	87000

Q3. Consider the following relations and the SQL query. Write the relational algebra expression and give two equivalent execution plans. (5 marks)

Student (sid, name, age, address)

Book (isbn, title, author)

Borrow (sid, isbn, date)

```
SELECT S.name
FROM Student AS S, Book AS B, Borrow AS R
WHERE S.sid = R.sid
AND B.isbn = R.isbn
AND B.author = 'Shakespeare'
AND S.age > 15
AND S.age < 20
```

Submission

You need to submit your assignment through Blackboard community by the due date. NO LATE SUBMISSION will be accepted.

You should do the assignment individually.

Your submission should be a pdf file named assignment3-yourstudentID.pdf that has a cover page with student name and student number.

You may submit your work multiple times, but only the last submission will be graded.