# Information Storage and Management II – CS2209

## Lecturer: Dr. Alejandro Arbelaez

# Project

This project is due on April/6/2020. You should submit your project as a single .txt file with your solution ([your-name-assignment.txt] electronically via Canvas.

Please note that this assignment will account for 10% of your module grade.

### Declaration:

By submitting this assignment. I agree to the following:

***"I have read and understand the UCC academic policy on plagiarism and I agree to the requirements set out thereby in relation to plagiarism and referencing. I confirm that I have referenced and acknowledged properly all sources used in preparation of this assignment.***

***I declare that this assignment is entirely my own work based on my personal study. I further declare that I have not engaged the services of another to either assist me in, or complete this assignment"***

### Part 1 [35 Marks]:

**Using our hockey database**

1. **[15 Marks]** Write a MongoDB query to retrieve the average age of each line of the teams.
   **Hint**: use *aggregate*, *$group _id: "$position",* and *total : {$avg : "$age"}*
2. **[10 Marks]** Write a MongoDB query to retrieve the player with the minimum age.
   **Hint**: first you will need to sort the records, and then take the first one
3. **[10 Marks]** Write a MongoDB query to retrieve the oldest player in the database.

## Part 2 [65 Marks]:

In this part of the project, we are going to take information from a relational database and migrate it to a document-oriented database (MongoDB).

The following tables describe the core data of the relational database.

**EMPLOYEE**

| FNAME | MINIT | LNAME | SSN | BDATE | ADDRESS | SEX | SALARY | SUPERSSN | DNO |
|---|---|---|---|---|---|---|---|---|---|
| John | B | Smith | 123456789 | 09-Jan-55 | 731 Fondren, Houston, TX | M | 30000 | 987654321 | 5 |
| Franklin | T | Wong | 333445555 | 08-Dec-45 | 638 Voss, Houston, TX | M | 40000 | 888665555 | 5 |
| Joyce | A | English | 453453453 | 31-Jul-62 | 5631 Rice, Houston, TX | F | 25000 | 333445555 | 5 |
| Ramesh | K | Narayan | 666884444 | 15-Sep-52 | 975 Fire Oak, Humble, TX | M | 38000 | 333445555 | 5 |
| James | E | Borg | 888665555 | 10-Nov-27 | 450 Stone, Houston, TX | M | 55000 | | 1 |
| Jennifer | S | Wallace | 987654321 | 20-Jun-31 | 291 Berry, Bellaire, TX | F | 43000 | 888665555 | 4 |
| Ahmad | V | Jabbar | 987987987 | 29-Mar-59 | 980 Dallas, Houston, TX | M | 25000 | 987654321 | 4 |
| Alicia | J | Zelaya | 999887777 | 19-Jul-58 | 3321 Castle, SPring, TX | F | 25000 | 987654321 | 4 |

**DEPENDENT**

| ESSN | DEPENDENT_NAME | SEX | BDATE | RELATIONSHIP |
|---|---|---|---|---|
| 123456789 | Alice | F | 31-Dec-78 | Daughter |
| 123456789 | Elizabeth | F | 05-May-57 | Spouse |
| 123456789 | Michael | M | 01-Jan-78 | Son |
| 333445555 | Alice | F | 05-Apr-76 | Daughter |
| 333445555 | Joy | F | 03-May-48 | Spouse |
| 333445555 | Theodore | M | 25-Oct-73 | Son |
| 987654321 | Abner | M | 29-Feb-32 | Spouse |

**DEPT_LOCATIONS**

| DNUMBER | DLOCATION |
|---|---|
| 1 | Houston |
| 4 | Stafford |
| 5 | Bellaire |
| 5 | Sugarland |
| 5 | Houston |

**WORKS_ON**

| ESSN | PNO | Hours |
|---|---|---|
| 123456789 | 1 | 32.5 |
| 123456789 | 2 | 7.5 |
| 333445555 | 2 | 10 |
| 333445555 | 3 | 10 |
| 333445555 | 10 | 10 |
| 333445555 | 20 | 10 |
| 453453453 | 1 | 20 |
| 453453453 | 2 | 20 |
| 666884444 | 3 | 40 |
| 888665555 | 20 | |
| 987654321 | 20 | 15 |
| 987654321 | 30 | 20 |
| 987987987 | 10 | 35 |
| 987987987 | 30 | 5 |
| 999887777 | 10 | 10 |
| 999887777 | 30 | 30 |

**PROJECT**

| PNAME | PNUMBER | PLOCATION | DNUM |
|---|---|---|---|
| ProductX | 1 | Bellaire | 5 |
| ProductY | 2 | Sugarland | 5 |
| ProductZ | 3 | Houston | 5 |
| Computerization | 10 | Stafford | 4 |
| Reorganization | 20 | Houston | 1 |
| Newbenefits | 30 | Stafford | 4 |

1. **[25 Marks]** Create a MongoDB with the previous information.
2. **[10 Marks]** Make a list of all project numbers for projects that involve an employee whose last name is “Smith”, either as a worker or a manager of the departments that controls the project.
3. **[15 Marks]** Write a MongoDB query to retrieve the name and address of his/her department name of the highest ranked employee (the one that does not report to anybody in the company).
4. **[15 Marks]** Write a MongoDB query to retrieve the average number of employees per department.