MSDS 7330

File Organization and Database Management

Mini Project 6

MongoDB

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**Option 2:**

Use MongoDB as a DB to store University DB that we used in the class. Use Python to connect

to the MongoDB and insert, update and query data from MongoDB.XML Schema:

Used a smart text editor (Atom) with some scripts to turn previously given sql files to mongo acceptable format. Subsequently leveraged pyMongo to create Mongo DB.

University DB creation code:

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| from pymongo import MongoClient  client = MongoClient('localhost', 27017)  db = client.University  try:  db.advisor.insert( [  { 's\_ID': '12345', 'i\_ID': '10101'},  { 's\_ID': '00128', 'i\_ID': '45565'},  { 's\_ID': '23121', 'i\_ID': '76543'},  { 's\_ID': '44553', 'i\_ID': '22222'},  { 's\_ID': '76543', 'i\_ID': '45565'},  { 's\_ID': '98765', 'i\_ID': '98345'},  { 's\_ID': '98988', 'i\_ID': '76766'}  ] )  db.classroom.insert( [  { 'building': 'Packard', 'room\_number': '101', 'capacity': '500' },  { 'building': 'Painter', 'room\_number': '514', 'capacity': '10' },  { 'building': 'Taylor', 'room\_number': '3128', 'capacity': '70' },  { 'building': 'Watson', 'room\_number': '120', 'capacity': '50' }  ] )  db.course.insert( [  { 'course\_id': 'BIO-101', 'title': 'Intro to Biology', 'dept\_name': 'Biology', 'credits': '4' },  { 'course\_id': 'BIO-301', 'title': 'Genetics', 'dept\_name': 'Biology', 'credits': '4' },  { 'course\_id': 'BIO-399', 'title': 'Computational Biology', 'dept\_name': 'Biology', 'credits': '3' },  { 'course\_id': 'CS-101', 'title': 'Intro to Computer Science', 'dept\_name': 'Comp. Sci.', 'credits': '4' },  { 'course\_id': 'CS-190', 'title': 'Game Design', 'dept\_name': 'Comp. Sci.', 'credits': '4' },  { 'course\_id': 'CS-315', 'title': 'Robotics', 'dept\_name': 'Comp. Sci.', 'credits': '3' },  { 'course\_id': 'CS-319', 'title': 'Image Processing', 'dept\_name': 'Comp. Sci.', 'credits': '3' },  { 'course\_id': 'CS-347', 'title': 'Database System Concepts', 'dept\_name': 'Comp. Sci.', 'credits': '3' },  { 'course\_id': 'EE-101', 'title': 'Intro to Digital Systems', 'dept\_name': 'Elec. Eng.', 'credits': '3' },  { 'course\_id': 'FIN-201', 'title': 'Investment Banking', 'dept\_name': 'Finance', 'credits': '3' },  { 'course\_id': 'HIS-351', 'title': 'World History', 'dept\_name': 'History', 'credits': '3' },  { 'course\_id': 'PHY-101', 'title': 'Physical Principles', 'dept\_name': 'Physics', 'credits': '4' }  ] )  db.department.insert( [  { 'dept\_name': 'Biology', 'building': 'Watson', 'budget': '90000' },  { 'dept\_name': 'Comp. Sci.', 'building': 'Taylor', 'budget': '100000' },  { 'dept\_name': 'Elec. Eng.', 'building': 'Taylor', 'budget': '85000' },  { 'dept\_name': 'Finance', 'building': 'Painter', 'budget': '120000' },  { 'dept\_name': 'History', 'building': 'Painter', 'budget': '50000' },  { 'dept\_name': 'Music', 'building': 'Packard', 'budget': '80000' },  { 'dept\_name': 'Physics', 'building': 'Watson', 'budget': '70000' }  ] )  db.instructor.insert( [  { 'id': '10101', 'name': 'Srinivasan', 'dept\_name': 'Comp. Sci.', 'salary': '65000' },  { 'id': '12121', 'name': 'Wu', 'dept\_name': 'Finance', 'salary': '90000' },  { 'id': '15151', 'name': 'Mozart', 'dept\_name': 'Music', 'salary': '40000' },  { 'id': '22222', 'name': 'Einstein', 'dept\_name': 'Physics', 'salary': '95000' },  { 'id': '32343', 'name': 'El Said', 'dept\_name': 'History', 'salary': '60000' },  { 'id': '33456', 'name': 'Gold', 'dept\_name': 'Physics', 'salary': '87000' },  { 'id': '45565', 'name': 'Katz', 'dept\_name': 'Comp. Sci.', 'salary': '75000' },  { 'id': '58583', 'name': 'Califeri', 'dept\_name': 'History', 'salary': '62000' },  { 'id': '76543', 'name': 'Singh', 'dept\_name': 'Finance', 'salary': '80000' },  { 'id': '76766', 'name': 'Crick', 'dept\_name': 'Biology', 'salary': '72000' },  { 'id': '83821', 'name': 'Brandt', 'dept\_name': 'Comp. Sci.', 'salary': '92000' },  { 'id': '98345', 'name': 'Kim', 'dept\_name': 'Elec. Eng.', 'salary': '80000' }  ] )  db.prereq.insert( [  { 'course\_id': 'BIO-301', 'prereq\_id': 'BIO-101' },  { 'course\_id': 'BIO-399', 'prereq\_id': 'BIO-101' },  { 'course\_id': 'CS-190', 'prereq\_id': 'CS-101' },  { 'course\_id': 'CS-315', 'prereq\_id': 'CS-101' },  { 'course\_id': 'CS-319', 'prereq\_id': 'CS-101' },  { 'course\_id': 'CS-347', 'prereq\_id': 'CS-101' },  { 'course\_id': 'EE-181', 'prereq\_id': 'PHY-101' }  ] )  db.section.insert( [  { 'course\_id': 'BIO-101', 'sec\_id': '1', 'semester': 'Summer', 'year': '2009', 'building': 'Painter', 'room\_number': '514', 'time\_slot\_id': 'B' },  { 'course\_id': 'BIO-301', 'sec\_id': '1', 'semester': 'Summer', 'year': '2010', 'building': 'Painter', 'room\_number': '514', 'time\_slot\_id': 'A' },  { 'course\_id': 'CS-101', 'sec\_id': '1', 'semester': 'Fall', 'year': '2009', 'building': 'Packard', 'room\_number': '101', 'time\_slot\_id': 'H' },  { 'course\_id': 'CS-101', 'sec\_id': '1', 'semester': 'Spring', 'year': '2010', 'building': 'Packard', 'room\_number': '101', 'time\_slot\_id': 'F' },  { 'course\_id': 'CS-190', 'sec\_id': '2', 'semester': 'Spring', 'year': '2009', 'building': 'Taylor', 'room\_number': '3128', 'time\_slot\_id': 'E' },  { 'course\_id': 'CS-190', 'sec\_id': '2', 'semester': 'Spring', 'year': '2009', 'building': 'Taylor', 'room\_number': '3128', 'time\_slot\_id': 'A' },  { 'course\_id': 'CS-315', 'sec\_id': '1', 'semester': 'Spring', 'year': '2010', 'building': 'Watson', 'room\_number': '120', 'time\_slot\_id': 'D' },  { 'course\_id': 'CS-319', 'sec\_id': '1', 'semester': 'Spring', 'year': '2010', 'building': 'Watson', 'room\_number': '100', 'time\_slot\_id': 'B' },  { 'course\_id': 'CS-347', 'sec\_id': '1', 'semester': 'Fall', 'year': '2009', 'building': 'Taylor', 'room\_number': '3128', 'time\_slot\_id': 'A' },  { 'course\_id': 'EE-181', 'sec\_id': '1', 'semester': 'Spring', 'year': '2009', 'building': 'Taylor', 'room\_number': '3128', 'time\_slot\_id': 'C' },  { 'course\_id': 'FIN-201', 'sec\_id': '1', 'semester': 'Spring', 'year': '2010', 'building': 'Packard', 'room\_number': '101', 'time\_slot\_id': 'B' },  { 'course\_id': 'HIS-351', 'sec\_id': '1', 'semester': 'Spring', 'year': '2010', 'building': 'Painter', 'room\_number': '514', 'time\_slot\_id': 'C' },  { 'course\_id': 'MU-199', 'sec\_id': '1', 'semester': 'Spring', 'year': '2010', 'building': 'Packard', 'room\_number': '101', 'time\_slot\_id': 'D' },  { 'course\_id': 'PHY-101', 'sec\_id': '1', 'semester': 'Fall', 'year': '2009', 'building': 'Watson', 'room\_number': '100', 'time\_slot\_id': 'A' }  ] )  db.student.insert( [  { 'id': '00128', 'name': 'Zhang', 'dept\_name': 'Comp. Sci.', 'tot\_cred': '102' },  { 'id': '12345', 'name': 'Shankar', 'dept\_name': 'Comp. Sci.', 'tot\_cred': '32' },  { 'id': '19991', 'name': 'Brandt', 'dept\_name': 'History', 'tot\_cred': '80' },  { 'id': '23121', 'name': 'Chavez', 'dept\_name': 'Finance', 'tot\_cred': '110' },  { 'id': '44553', 'name': 'Peltier', 'dept\_name': 'Physics', 'tot\_cred': '56' },  { 'id': '45678', 'name': 'Levy', 'dept\_name': 'Physics', 'tot\_cred': '46' },  { 'id': '54321', 'name': 'Williams', 'dept\_name': 'Comp. Sci.', 'tot\_cred': '54' },  { 'id': '55739', 'name': 'Sanchez', 'dept\_name': 'Music', 'tot\_cred': '38' },  { 'id': '70557', 'name': 'Snow', 'dept\_name': 'Physics', 'tot\_cred': '0' },  { 'id': '76543', 'name': 'Brown', 'dept\_name': 'Comp. Sci.', 'tot\_cred': '58' },  { 'id': '76653', 'name': 'Aoi', 'dept\_name': 'Elec. Eng.', 'tot\_cred': '60' },  { 'id': '98765', 'name': 'Bourikas', 'dept\_name': 'Elec. Eng.', 'tot\_cred': '98' },  { 'id': '98988', 'name': 'Tanaka', 'dept\_name': 'Biology', 'tot\_cred': '120' }  ] )  db.teaches.insert( [  { 'id': '75766', 'course\_id': 'BIO-101', 'sec\_id': '1', 'semester': 'Summer', 'year': '2009' },  { 'id': '75766', 'course\_id': 'BIO-301', 'sec\_id': '1', 'semester': 'Summer', 'year': '2010' },  { 'id': '10101', 'course\_id': 'CS-101', 'sec\_id': '1', 'semester': 'Fall', 'year': '2009' },  { 'id': '45565', 'course\_id': 'CS-101', 'sec\_id': '1', 'semester': 'Spring', 'year': '2010' },  { 'id': '83821', 'course\_id': 'CS-190', 'sec\_id': '1', 'semester': 'Spring', 'year': '2009' },  { 'id': '83821', 'course\_id': 'CS-190', 'sec\_id': '2', 'semester': 'Spring', 'year': '2009' },  { 'id': '10101', 'course\_id': 'CS-315', 'sec\_id': '1', 'semester': 'Spring', 'year': '2010' },  { 'id': '45565', 'course\_id': 'CS-319', 'sec\_id': '1', 'semester': 'Spring', 'year': '2010' },  { 'id': '83821', 'course\_id': 'CS-319', 'sec\_id': '2', 'semester': 'Spring', 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'1','semester': 'Spring','year': '2010', 'grade': 'A' },  {'id': '12345','course\_id': 'CS-347','sec\_id': '1','semester': 'Fall','year': '2009', 'grade': 'A' },  {'id': '19991','course\_id': 'HIS-351','sec\_id': '1','semester': 'Spring','year': '2010', 'grade': 'B' },  {'id': '23121','course\_id': 'FIN-201','sec\_id': '1','semester': 'Spring','year': '2010', 'grade': 'C+' },  {'id': '44553','course\_id': 'PHY-101','sec\_id': '1','semester': 'Fall','year': '2009', 'grade': 'B-' },  {'id': '45678','course\_id': 'CS-101','sec\_id': '1','semester': 'Fall','year': '2009', 'grade': 'F' },  {'id': '45678','course\_id': 'CS-101','sec\_id': '1','semester': 'Spring','year': '2010', 'grade': 'B+' },  {'id': '45678','course\_id': 'CS-319','sec\_id': '1','semester': 'Spring','year': '2010', 'grade': 'B' },  {'id': '54321','course\_id': 'CS-101','sec\_id': '1','semester': 'Fall','year': '2009', 'grade': 'A-' },  {'id': '54321','course\_id': 'CS-190','sec\_id': '2','semester': 'Spring','year': 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'start\_min': '0', 'end\_hr': '16', 'end\_min': '50' },  { 'time\_slot\_id': 'H', 'day': 'W', 'start\_hr': '10', 'start\_min': '0', 'end\_hr': '12', 'end\_min': '30' }  ] )  print('Database creation success!')  except:  print('Database creation failure!') |

Screenshot:

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insert, update, delete and query code:

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| from pymongo import MongoClient  client = MongoClient('localhost', 27017)  db = client.University  # query 1: fetch advisor with id 12345  print("# query 1: fetch advisor with id 12345 \n")  my\_post = db.advisor.find\_one({'s\_ID': '12345'})  print(my\_post)  print('\n')  # query 2: fetch student with id 99999 if exists  print("# query 2: fetch student with id 99999 if exists")  my\_post2 = db.student.find\_one({'id': '99999'})  if not my\_post2:  print(my\_post2)  print('\n')  else:  print("No record found!")  print('\n')  # query 3: insert student and then fetch  print("# query 3: insert student with id 99999 and then fetch")  post = { 'id': '99999', 'name': 'Evan', 'dept\_name': 'Comp. Sci.', 'tot\_cred': '999' }  post\_id = db.student.insert\_one(post).inserted\_id  my\_post3 = db.student.find\_one({'id': '99999'})  print(my\_post3)  print('\n')  # query 4: update student with id 99999 and then fetch  print("# query 4: update student with id 99999 and then fetch")  uppost = { 'id': '99999', 'name': 'Zack', 'dept\_name': 'Comp. Sci.', 'tot\_cred': '600' }  db.student.update({'id':'99999'}, {"$set": uppost}, upsert=False)  my\_post4 = db.student.find\_one({'id': '99999'})  print(my\_post4)  print('\n')  # query 5 remove student with id 99999 and then fetch  print("# query 5 remove student with id 99999 and then fetch")  db.student.remove({'id':'99999'})  my\_post5 = db.student.find\_one({'id': '99999'})  if not my\_post5:  print(my\_post5)  print('\n')  else:  print("No record found!")  print('\n') |

Screenshot:

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