**ASSIGNMENT 11 – W3D3 – LESSON12 –MongoDB Data Modeling:**

**In this assignment, you will practice NoSQL data modeling and designing a database for MongoDB, based on the following requirement:**

**Create a NoSQL (MongoDB) database design for an application to manage data for a library, taking into consideration the following requirements:**

**Books have an ISBN number and are categorized by author and tagged by keywords to facilitate search.**

**Books can be borrowed by library members (who are of 3 types, students or faculty or staff),**

**The librarian will be able to check all borrowed books and their return (or due) date, so that he/she may contact the Library member who is late in returning the book(s) they borrowed.**

**Each book has an overdue fee (per day) associated with it.**

**Note: You are expected to come up with the database specification (i.e. database name, collection(s) name(s), field names etc.). Then create/implement the database in your MongoDB server and populate it with some data (also you can make these up).**

**Include a brief explanation for every specific design decision/choice you make. E.g.**

**whether you choose to embed some data or not, and why.**

**Next, use either the mongoexport or mongodump tool to write-out your database data to a file, which you will submit.**

**Also, while performing the above tasks, take screenshot(s) of your work and save into a document, which you will also submit to the Assignment 11 item on Sakai.**

Each document has an issue date, due date, member details and Today (As the date of followup or date of books return) as embedded properties. When book is issued to a member, the issue date, due date and member details are updated. When the book is returned or folloup is done, the property “Today” is updated and the overdue is calculated. By using $match, $project and $multiply the overdue fee of that particular book is displayed.

use library-db

switched to db library-db

show collections

library

db.library.find().pretty()

{

"\_id" : ObjectId("610c93d3a83f2ca49890f3da"),

"code" : "A",

"ISBN" : "ISBN-000-234",

"Title" : "C# foundation",

"OverdueFee" : 2.90,

"Publisher" : "First Head",

"Date Published" : "2020-05-05",

"IssueDate" : "null",

"Due Date" : "null",

"Member" : "null"

"Today" : "null"

}

{

"\_id" : ObjectId("610c93f1a83f2ca49890f3db"),

"code" : "B",

"ISBN" : "978-0135166307",

"Title" : "Core Java Fundamentals",

"OverdueFee" : 1.75,

"Publisher" : "Pearson",

"Date Published" : "2018-08-27",

"IssueDate" : "null",

"Due Date" : "null",

"Member" : "null"

"Today" : "null"

}

{

"\_id" : ObjectId("610c93f8a83f2ca49890f3dc"),

"code" : "C",

"ISBN" : "978-0321714114",

"Title" : "C++ Primer",

"OverdueFee" : 1.99,

"Publisher" : "Stanley B. Lipmann",

"Date Published" : "2019-08-08",

"IssueDate" : "null",

"Due Date" : "null",

"Member" : "null"

"Today" : "null"

}

{

"\_id" : ObjectId("610c93ffa83f2ca49890f3dd"),

"code" : "D",

"ISBN" : "1234534",

"Title" : "Dagmay Fetene",

"OverdueFee" : 1.00,

"Publisher" : "Dr Kibreab Kibrewosen",

"Date Published" : "1999-02-04",

"IssueDate" : "null",

"Due Date" : "null",

"Member" : "null"

"Today" : "null"

}

{

"\_id" : ObjectId("610c9406a83f2ca49890f3de"),

"code" : "E",

"ISBN" : "978-0073523323",

"Title" : "Database System Concept 6th Edition",

"OverdueFee" : 1.47,

"Publisher" : "MC-Graw Hill",

"Date Published" : "2011-05-19",

"IssueDate" : "null",

"Due Date" : "null",

"Member" : "null"

"Today" : "null"

}

{

"\_id" : ObjectId("610c940ca83f2ca49890f3df"),

"code" : "F",

"ISBN" : "12345",

"Title" : "Design Patterns",

"OverdueFee" : 1.80,

"Publisher" : "Publisher1",

"Date Published" : "2020-05-08",

"IssueDate" : "null",

"Due Date" : "null",

"Member" : "null"

"Today" : "null"

}

{

"\_id" : ObjectId("610c9413a83f2ca49890f3e0"),

"code" : "G",

"ISBN" : "123-45677891",

"Title" : "Getch Book Edited",

"OverdueFee" : 1.50,

"Publisher" : "Longman",

"Date Published" : "2019-05-06",

"IssueDate" : "null",

"Due Date" : "null",

"Member" : "null"

"Today" : "null"

}

{

"\_id" : ObjectId("610c941ba83f2ca49890f3e1"),

"code" : "H",

"ISBN" : "21312423535",

"Title" : "GodFather",

"OverdueFee" : 2.00,

"Publisher" : "ARA",

"Date Published" : "1870-06-13",

"IssueDate" : "null",

"Due Date" : "null",

"Member" : "null"

"Today" : "null"

}

{

"\_id" : ObjectId("610c9422a83f2ca49890f3e2"),

"code" : "I",

"ISBN" : "978-0135974488",

"Title" : "Hacker Cookbook",

"OverdueFee" : 1.20,

"Publisher" : "TopSecurity",

"Date Published" : "2020-05-01",

"IssueDate" : "null",

"Due Date" : "null",

"Member" : "null"

"Today" : "null"

}

{

"\_id" : ObjectId("610c9429a83f2ca49890f3e3"),

"code" : "J",

"ISBN" : "1234-121210",

"Title" : "Harry Potter",

"OverdueFee" : 0.50,

"Publisher" : "Habtom W. Michael",

"Date Published" : "null",

"IssueDate" : "null",

"Due Date" : "null",

"Member" : "null"

"Today" : "null"

}

**After the book is issued to a student**

db.library.updateOne({"code":"E"},{$set:{"IssueDate":"2021-07-15","Due Date":"2021-07-31","Member":"Student","Today" : "null"}})

{ "acknowledged" : true, "matchedCount" : 1, "modifiedCount" : 1 }

db.library.find({"code":"E"})

{ "\_id" : ObjectId("610c9406a83f2ca49890f3de"), "code" : "E", "ISBN" : "978-0073523323", "Title" : "Database System Concept 6th Edition", "OverdueFee" : 1.47, "Publisher" : "MC-Graw Hill", "Date Published" : "2011-05-19", "IssueDate" : "2021-07-15", "Due Date" : "2021-07-31", "Member" : "Student", "Today" : "null"}

**When the book is returned or Follwed up on 2021-08-05 (5 days after due date)**

db.library.updateOne({"code":"E"},{$set:{"Today" : "2021-08-05"}})

{ "acknowledged" : true, "matchedCount" : 1, "modifiedCount" : 1 }

db.library.aggregate([{$match:{code:"E"}},{$project:{\_id:0,code:"$code",Title:"$Title",OverdueFees:{$multiply:["$OverdueFee",5]}}}])

{ "code" : "E", "Title" : "Database System Concept 6th Edition", "OverdueFees" : 7.35 }