**Database Design and Implementation for a Fitness Center**

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DBAS27198 Database Design and Implementation

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1. Conceptual Model

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1. Relational Database
   1. Data Structure Diagram

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* 1. Create tables

---- create table

CREATE TABLE GymLocation(

    locationid NUMERIC(3) PRIMARY KEY,

    locationname VARCHAR(30),

    address VARCHAR(30),

    tel VARCHAR(30),

    email VARCHAR(30),

    visitedTime NUMERIC(3)

)

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CREATE TABLE Amenity (

    amenityid NUMERIC(3) PRIMARY KEY,

    amenity VARCHAR(30),

    locationid numeric(3) CONSTRAINT gymlocation\_locationid\_pk FOREIGN KEY REFERENCES GymLocation(locationid)

)

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CREATE TABLE Certificate (

    certificateid NUMERIC(3) PRIMARY KEY,

    coachid NUMERIC(3) CONSTRAINT coach\_coachid\_pk FOREIGN KEY REFERENCES Coach(coachid),

    certificatename VARCHAR(30)

)

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CREATE TABLE Coach (

    coachid NUMERIC(3) PRIMARY KEY,

    coachname VARCHAR(30),

    level NUMERIC(2),

    rating NUMERIC(2)

)

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CREATE TABLE CoachLocation (

    coachlocationid NUMERIC(3) PRIMARY KEY,

    coachid NUMERIC(3) CONSTRAINT coach\_coachid\_pk1 FOREIGN KEY REFERENCES Coach(coachid),

    locationid NUMERIC(3) CONSTRAINT gymlocation\_locationid\_pk1 FOREIGN KEY REFERENCES GymLocation(locationid)

)

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CREATE TABLE Review (

    reviewid numeric(3) PRIMARY KEY,

    reviewdate DATE NOT NULL,

    communication int CONSTRAINT chk\_in\_rating CHECK (communication in (1, 2, 3, 4, 5)),

    enthusiasm int CONSTRAINT chk\_in\_rating2 CHECK (enthusiasm in (1, 2, 3, 4, 5)),

    punctuality int  CONSTRAINT chk\_in\_rating3 CHECK (punctuality in (1, 2, 3, 4, 5)),

    description VARCHAR(30),

    coachid numeric(3)  CONSTRAINT coach\_coachid\_pk2 FOREIGN KEY REFERENCES Coach(coachid)

)

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CREATE TABLE Reference (

    referenceid NUMERIC(3) PRIMARY KEY,

    coachid NUMERIC(3) CONSTRAINT coach\_coachid\_pk3 FOREIGN KEY REFERENCES Coach(coachid),

    clientid NUMERIC(3) CONSTRAINT client\_clientid\_pk FOREIGN KEY REFERENCES Client(clientid),

)

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CREATE TABLE Client (

    clientid numeric(3) PRIMARY KEY,

    clientname VARCHAR(30),

    phone VARCHAR(30),

    email VARCHAR(30)

)

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CREATE TABLE Class (

    classid NUMERIC(3) PRIMARY KEY,

    date DATE,

    time TIME,

    classname VARCHAR(30),

    price DECIMAL(5, 2) CONSTRAINT chk\_in\_price1 CHECK (price >= 0.0),

    room VARCHAR(30),

    locationid NUMERIC(3) CONSTRAINT locationid\_pl FOREIGN KEY REFERENCES GymLocation(locationid)

)

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* 1. Insert rows

-------insert

INSERT INTO GymLocation

VALUES (100, 'Midtown', 'Brampton', '123-456-789', 'nguvuong@sheridancollege.ca'  ,15),

        (101, 'Çabbagetown', 'Brampton1', '123-456-789', 'nguvuong1@sheridancollege.ca' , 8),

        (102, 'Midtown',  'Brampton2', '123-456-789', 'nguvuon2g@sheridancollege.ca' , 3)

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INSERT INTO Reference

VALUES (1,100, 100), (2, 100,101), (3, 100,102)

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INSERT INTO client

VALUES (100, 'vuong1', '111-222-333', 'aa@aaa.com'), (101, 'vuong2', '111-222-333', 'bb@bbb'), (102, 'vuong3', '111-222-333', 'cc@ccc')

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INSERT INTO class

VALUES (100, '2023-06-15', '6:00', 'Yoga', 10, 'Big Studio', 100),

(101, '2023-06-16','7:00', 'Swimming', 13.5, 'Big Studio', 100),

(102, '2023-06-17','8:00', 'Yoga', 15, 'Small Studio', 100)

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INSERT INTO Review

VALUES (100, '12-1-2023', 4,5,4, 'good', 100),

(101, '12-1-2023', 4,5,4, 'good', 100),

(102, '12-2-2023', 5,5,5, 'very good', 100),

(103, '12-3-2023', 3,5,3, 'great', 100),

(104, '12-4-2023', 4,5,4, 'perfect', 100)

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insert into Certificate

values (100, 100, 'message'), (101, 100, 'yoga'), (102, 100, 'swimming')

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INSERT INTO Amenity

VALUES(10, 'Sauna', 100 ),(11, 'Green Zone', 100),(12, 'Hot Yoga', 100)

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insert into CoachLocation

values (1, 100, 100), (2, 101, 100), (3, 102, 100)

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insert into Coach

VALUES (100, 'Sally', 3, 5), (101, 'Adam', 2, 3), (102, 'Sander', 3, 5)

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1. Convert entities to MongoDB collection

//one to many approach

// reference approach

db.amenity.insertMany**([**

**{**amenityid**:** 10**,** amenity**:** 'Sauna'**},**

**{**amenityid**:** 11**,** amenity**:** 'Green Zone'**},**

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Description automatically generated**{**amenityid**:** 12**,** amenity**:** 'Hot Yoga'**}])**

db.GymLocation.insertMany**([**

**{**locationid**:** 100**,** locationname**:** 'Midtown'**,** address**:** 'Brampton'**,** tel**:** '123-456-789'**,** email**:** 'nguvuong@sheridancollege.ca'**,** visitedTime**:** 15**,** amenityid**:[**10**,**11**,**12**]},**

**{**locationid**:** 101**,** locationname**:** 'Çabbagetown'**,** address**:** 'Brampton1'**,** tel**:** '123-456-789'**,** email**:** 'nguvuong1@sheridancollege.ca'**,** visitedTime**:** 8**,** amenityid**:** 11**,**12**]},**

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Description automatically generated**{**locationid**:** 102**,** locationname**:** 'Midtown'**,** address**:** 'Brampton2'**,** tel**:** '123-456-789'**,** email**:** 'nguvuong2@sheridancollege.ca'**,** visitedTime**:** 3**,** amenityid**:** 10**}])**

1. Select statements

------  select

--) wireframe 1

SELECT locationname as Locations, visitedTime as Timevisitedthismonth from GymLocation

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--) wireframe 2

SELECT

    GymLocation.address,

    GymLocation.tel,

    GymLocation.email,

    Amenity.amenity as Amenities,

    Coach.coachname as Coaches

FROM

    GymLocation

JOIN

    Amenity ON GymLocation.locationid = Amenity.locationid

JOIN

    CoachLocation ON CoachLocation.locationid = GymLocation.locationid

JOIN

    Coach ON Coach.coachid =   CoachLocation.coachid

WHERE

    GymLocation.locationname = 'Midtown';

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--) wireframe 3

select  coach.coachname as Coaches, coach.level,  coach.rating from coach

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--) wireframe 4

SELECT Coach.coachname,

    Coach.[level],

    Coach.rating,

    GymLocation.locationname as Locations\_I\_work\_from,

    Certificate.certificatename as Certificates,

    Client.clientname,

    Client.email,

    Client.phone

FROM GymLocation,

     CoachLocation,

     Coach,

     Certificate,

     Reference,

     Client

WHERE Certificate.coachid = (select Coach.coachid where coachname = 'Sally')

AND Reference.coachid = (select Coach.coachid where coachname = 'Sally')

AND GymLocation.locationid = any (select CoachLocation.locationid where CoachLocation.coachid =  (select Coach.coachid where coachname = 'Sally'))

AND Client.clientid = any (select Reference.clientid  where Reference.coachid = (select Coach.coachid where coachname = 'Sally'))

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