MAKERERE UNIVERSITY BUSINESS SCHOOL
COURSE WORK TWO TAKE HOME ASSIGNMENT FOR DIPLOMA IN COMPUTER SCIENCE
ACADEMIC YEAR 2024/2025, SEMESTER I

COURSE NAME: DATABASE SYSTEMS COURSE CODE: DCS2109
YEAR OF STUDY: TWO DATE 16th October, 2024 DEADLINE: 21st October, 2024

INSTRUCTIONS:

1. This is an individual assignment to be submitted with in a period of one week from now and to be considered as part of coursework one assessment.
2. You will be required to upload a copy of your work on MUBSEP before the deadline ends.
3. You will be required to present in class ***October 23, 2024*** from 10am.
4. You can use Microsoft Visio, ERD Plus, Lucid charts and any other available online tool to help you in designing your entity relationship diagrams. The choice of the tool is at your own discretion. Use of tools is not compulsory. You may choose to only draw the ERDs on a piece on paper and scan it into your work.!

GUIDING QUESTIONS – 20 MARKS

Using the case scenarios provided to your group, address the following tasks:

a. Identify all the entities in your given scenario (2 marks)
b. Identify the attributes of each entity and any relationship (s) among the entities. (3marks)
c. Come up with a conceptual and logical models (5marks)
d. Come up with an Entity relationship diagram to capture the data elements, requirements and business rules for the assigned scenario. (this should be at the level of physical design) – (8marks)
e. Distinguish between a logical and physical model. (2 marks)
f. Using SQL,
    i Create all tables you identified in the Entity relationship Diagram. (10marks)
    ii Insert at least 20 records in each of the tables you have created. (5marks)
    iii Execute 10 data retrieval operations of your choice on the inserted data. Ensure your retrieval statements include row limiting, data sorting, column aliasing, and joins. (10marks)
    iv Delete the third record you entered in each of the tables you created above. (2marks)
    v Update the last four records in all the tables you created above. (2marks)
    vi Drop one of the tables you created above (1mark)

CASE STUDIES:

E-commerce Platform: (Akol Tino Bridget)

Imagine you're designing a database schema for an e-commerce platform. This platform allows users to browse products, add them to their cart, and make purchases. Each user has a unique user ID, username, and email address. Products are identified by a product ID and have attributes such as name, price, and description. Carts contain items added by users and are associated with their respective user IDs.

Library Management System: (Kiiza Gertrude)

Suppose you're developing a database schema for a library management system. This system allows users to borrow books, return books, and search for available titles. Each user has a unique user ID, username,

and email address. Books are identified by a book ID and have attributes like title, author, and genre. Transactions record the borrowing and returning of books, associating them with user IDs and book IDs.

Online Learning Platform: (Adero Pilister Dorothy)

Consider designing a database schema for an online learning platform. This platform allows users to enroll in courses, view course materials, and take assessments. Each user has a unique user ID, username, and email address. Courses are identified by a course ID and have attributes such as title, description, and instructor. Enrolments track the association between users and courses, while assessments record user scores and are linked to course IDs.

Fitness Tracking App: (Nambale Kelly)

Suppose you're developing a database schema for a fitness tracking app. This app allows users to log workouts, track their progress, and set fitness goals. Each user has a unique user ID, username, and email address. Workouts are identified by a workout ID and contain details like exercise type, duration, and date. Progress is recorded through metrics such as weight, body measurements, and performance stats.

Hotel Reservation System: (Mutonyi Doreen)

Imagine designing a database schema for a hotel reservation system. This system allows users to search for available rooms, book accommodations, and manage reservations. Each user has a unique user ID, username, and email address. Rooms are identified by a room ID and have attributes like room type, price, and availability status. Reservations are linked to users and rooms, recording booking details such as check-in/out dates and payment information.

Online Forum Platform: (Nakacwa Brenda)

You're tasked with designing a database schema for an online forum platform. This platform allows users to create threads, reply to threads, and upvote/downvote posts. Each user has a unique user ID, username, and email address. Threads are identified by a thread ID and contain a title and content. Replies are associated with threads and have their own reply ID, content, and date.

Event Management System: (Tuname Thomas)

Consider designing a database schema for an event management system. This system allows users to create events, RSVP to events, and manage guest lists. Each user has a unique user ID, username, and email address. Events are identified by an event ID and have attributes such as title, date, and location. RSVPs record user attendance and are linked to event IDs.

Recipe Sharing Platform: (Atukunda Shanitah)

Suppose you're developing a database schema for a recipe sharing platform. This platform allows users to share recipes, rate recipes, and leave comments. Each user has a unique user ID, username, and email address. Recipes are identified by a recipe ID and contain details like title, ingredients, and instructions. Ratings record user evaluations of recipes, while comments provide feedback and are associated with recipe IDs.

Employee Management System: (Ssekitto Abdul)

Imagine designing a database schema for an employee management system. This system allows users to manage employee records, assign tasks, and track performance. Each user has a unique user ID, username, and email address. Employees are identified by an employee ID and have attributes such as name, position, and department. Tasks are assigned to employees and have their own task ID, description, and deadline.

Financial Budgeting App: (Ochieng Isaac Omondi)

You're tasked with designing a database schema for a financial budgeting app. This app allows users to track expenses, set budgets, and analyze spending habits. Each user has a unique user ID, username, and email address. Expenses are identified by an expense ID and contain details like amount, category, and date. Budgets set limits for spending in different categories and are associated with user IDs.

Music Streaming Service: (Kimbowa Elvis)

Suppose you're tasked with designing a database schema for a music streaming service. This service allows users to listen to songs, create playlists, and follow artists. Each user has a unique user ID, username, and email address. Songs are identified by a song ID and contain details such as title, artist, and genre. Playlists are curated by users and are associated with user IDs.

Project Management Tool: (Mutesasira Mesha Aine)

Imagine designing a database schema for a project management tool. This tool allows users to create projects and assign tasks. Each user has a unique user ID, username, and email address. Projects are identified by a project ID and contain attributes like title, description, and deadline. Tasks are associated with projects and have their own task ID, description, and status.

Travel Booking Platform: (Namwemezi Paraside)

Consider designing a database schema for a travel booking platform. This platform allows users to search for flights, book accommodations, and plan itineraries. Each user has a unique user ID, username, and email address. Flights are identified by a flight ID and contain details like airline, departure/arrival times, and price. Bookings record user reservations and are associated with user IDs and flight IDs.

Video Sharing Platform: (Nuwe Ian)

Suppose you're developing a database schema for a video sharing platform. This platform allows users to upload videos, comment on videos, and subscribe to channels. Each user has a unique user ID, username, and email address. Videos are identified by a video ID and contain attributes such as title, duration, and upload date. Comments provide feedback on videos and are associated with video IDs.

Healthcare Appointment Booking System: (Atukwatse Manzi Anthlem)

You're tasked with designing a database schema for a healthcare appointment booking system. This system allows users to schedule appointments with healthcare providers, view medical records, and receive reminders. Each user has a unique user ID, username, and email address. Appointments are identified by an appointment ID and contain details like date, time, and reason for visit. Medical records store patient information and are linked to user IDs.

Recipe Recommendation Platform: (Mwanje Ronnie)

Suppose you're tasked with designing a database schema for a recipe recommendation platform. This platform allows users to discover new recipes based on their preferences, save favorite recipes, and rate recipes they've tried. Each user has a unique user ID, username, and email address. Recipes are identified by a recipe ID and contain details like title, ingredients, and instructions. Saved recipes are associated with user IDs, and ratings are linked to both user IDs and recipe IDs. Design the Entity-Relationship Diagram (ERD) for this recipe recommendation platform, encompassing all necessary entities, attributes, and relationships.

Customer Relationship Management (CRM) System: (Isabirye Groch)

Imagine designing a database schema for a Customer Relationship Management (CRM) system. This system allows businesses to manage customer interactions, track sales leads, and analyze customer data. Each customer has a unique customer ID, name, and contact information. Leads are identified by a lead ID and

contain details like source, status, and contact person. Interactions, such as calls or emails, are associated with both customers and leads.

Online Auction Platform: (Umuhoza Rhinah)

Consider designing a database schema for an online auction platform. This platform allows users to list items for auction, place bids on items, and monitor auction activity. Each user has a unique user ID, username, and email address. Items are identified by an item ID and contain attributes like title, description, and starting bid. Bids are associated with both users and items, recording bid amounts and timestamps.

Real Estate Listing Website: (Kaasa Astame)

Suppose you're developing a database schema for a real estate listing website. This website allows users to search for properties, view property details, and contact agents. Each user has a unique user ID, username, and email address. Properties are identified by a property ID and contain attributes like address, price, and number of bedrooms/bathrooms. Agents are associated with properties, and users can inquire about properties through contact forms.

Gaming Community Platform: (Mungu Jakisa Maurice)

You're tasked with designing a database schema for a gaming community platform. This platform allows users to create profiles, join gaming groups, and participate in discussions. Each user has a unique user ID, username, and email address. Gaming groups are identified by a group ID and contain attributes like name, description, and number of members. Discussions are associated with groups and contain details like topic, content, and date.

Fitness Social Network: (Odong John Jonathan)

Imagine designing a database schema for a fitness social network. This platform allows users to track workouts, share fitness achievements, and connect with other fitness enthusiasts. Each user has a unique user ID, username, and email address. Workouts are identified by a workout ID and contain details like exercise type, duration, and date. Achievements are recorded by users and are associated with user IDs.

Employee Training Management System: (Kalungi Velma Mercy)

Suppose you're developing a database schema for an employee training management system. This system allows businesses to manage employee training programs, track employee progress, and analyze training data. Each employee has a unique employee ID, name, and department. Training programs are identified by a program ID and contain attributes like title, description, and duration. Employee progress is recorded through training completion records, linked to employee and program IDs.

Freelancer Marketplace: (Malinga Job)

Consider designing a database schema for a freelancer marketplace platform. This platform allows users to post job listings, submit proposals, and hire freelancers. Each user has a unique user ID, username, and email address. Job listings are identified by a job ID and contain details like title, description, and budget. Proposals are associated with both users and job listings, containing proposal details and bid amounts.

Health Tracking App: (Agaba Richard)

Suppose you're tasked with designing a database schema for a health tracking app. This app allows users to monitor their health metrics, set goals, and track progress over time. Each user has a unique user ID, username, and email address. Health metrics are recorded by users and include attributes like weight, blood pressure, and activity levels. Goals are associated with user IDs and contain details such as target values and deadlines.

Inventory Management System: (Haumba Joseph)

Imagine designing a database schema for an inventory management system. This system allows businesses to track inventory levels, manage product listings, and process orders. Each product has a unique product ID, name, and description. Orders are identified by an order ID and contain details like customer information, order date, and order status. Inventory levels are associated with product IDs, tracking quantities available for sale.

Subscription Management System: (Olema Swaib)

Suppose you're tasked with designing a database schema for a subscription management system used by subscription-based businesses. This system allows companies to manage subscriber accounts, track subscription plans, and process subscription payments. Each subscriber has a unique subscriber ID, name, and contact information. Subscription plans are identified by a plan ID and contain details like plan name, price, and features. Subscription payments record payment transactions and are associated with subscriber IDs and plan IDs.

Online Auction Marketplace: (Musuto Isaac Powell)

Consider designing a database schema for an online auction marketplace platform. This platform allows users to list items for auction, bid on items, and manage their auction activities. Each user has a unique user ID, username, and email address. Items are identified by an item ID and contain details like title, description, and starting bid price. Bids are associated with both users and items, recording bid amounts and timestamps.

Online Survey Platform: (Mulayi Conrad)

You're tasked with designing a database schema for an online survey platform. This platform allows users to create surveys, collect responses, and analyze results. Each user has a unique user ID, username, and email address. Surveys are identified by a survey ID and contain attributes like title, description, and question items. Responses are associated with survey IDs and contain respondent information, answer choices, and timestamps.

Social Networking Platform for Professionals: (Mukeera Huzaifah)

Suppose you're developing a database schema for a social networking platform tailored for professionals. This platform allows users to create profiles, connect with colleagues, and share industry insights. Each user has a unique user ID, username, and email address. Connections between users are identified by connection IDs and contain attributes like connection status and date established.

Inventory Tracking System for Retail Stores: (Mugisha Billy)

Consider designing a database schema for an inventory tracking system used by retail stores. This system allows stores to monitor stock levels, track sales, and manage product listings. Each store has a unique store ID and contains details like store name and location. Products are identified by a product ID and contain attributes such as name, description, and price. Sales transactions record purchases and are associated with store IDs and product IDs. Design the Entity-Relationship .

Student Information System for Educational Institutions: (Kaweesa Jonathan)

Imagine designing a database schema for a student information system used by educational institutions. This system allows institutions to manage student records, enrollments, and academic performance. Each student has a unique student ID, name, and contact information. Courses are identified by a course ID and contain details like course title and instructor. Enrollments record student enrollments in courses and are associated with student IDs and course IDs. Design the Entity-Relationship Diagram (ERD) for this student information system, incorporating all relevant entities, attributes, and relationships.

Pet Adoption Platform: (Mutabirura Marvin)

You're tasked with designing a database schema for a pet adoption platform. This platform allows users to search for adoptable pets, submit adoption applications, and manage pet listings. Each user has a unique user ID, username, and email address. Pets are identified by a pet ID and contain attributes like species, breed, and age. Adoption applications record user requests to adopt pets and are associated with both user IDs and pet IDs.

Task Management System: (Bwambale Humphrey)

Imagine you're designing a database schema for a task management system. This system allows users to create tasks, assign tasks to team members, and track task completion. Each user has a unique user ID, username, and email address. Tasks are identified by a task ID and contain details like title, description, and deadline. Assignments record the association between users and tasks, tracking who is responsible for completing each task.

Property Rental Management System: (Otafiire Herbert)

Suppose you're developing a database schema for a property rental management system. This system allows landlords to list properties for rent, manage tenant information, and track rental payments. Each landlord has a unique landlord ID, name, and contact information. Properties are identified by a property ID and contain attributes like address, rent amount, and availability status. Tenants are associated with properties and have attributes such as name, contact information, and lease start/end dates.

Ticketing System for Events: (Tusiime Prince)

Consider designing a database schema for a ticketing system used for events. This system allows event organizers to create events, sell tickets, and manage attendee information. Each event has a unique event ID, title, and date. Tickets are identified by a ticket ID and contain details like ticket type, price, and availability status. Attendees are associated with events and tickets, recording information such as name, email address, and ticket quantity.

Food Delivery Platform: (Asaba Nelson)

Imagine you're tasked with designing a database schema for a food delivery platform. This platform allows users to order food from restaurants, track orders in real-time, and provide feedback on their dining experience. Each user has a unique user ID, username, and email address. Restaurants are identified by a restaurant ID and contain details like name, cuisine type, and location. Orders are associated with users and restaurants, containing information such as order items, delivery address, and order status.

Customer Support Ticketing System: (Wamyoya Joachim)

You're tasked with designing a database schema for a customer support ticketing system. This system allows businesses to manage customer inquiries, assign tickets to support agents, and track resolution times. Each customer has a unique customer ID, name, and contact information. Tickets are identified by a ticket ID and contain details like ticket status, priority, and description of the issue. Support agents are associated with tickets and have attributes such as name, email address, and assigned ticket count.

Online Banking System: (Muwonge Johnson)

Imagine designing a database schema for an online banking system. This system allows users to manage their accounts, transfer funds, and view transaction history. Each user has a unique user ID, username, and email address. Accounts are identified by an account ID and contain details like account type, balance, and account status. Transactions record transfers between accounts and include information such as transaction ID, amount, and timestamp.

Car Rental Management System: (Nambooze Shamim)
Suppose you're developing a database schema for a car rental management system. This system allows users to rent cars, make reservations, and manage rental bookings. Each user has a unique user ID, username, and email address. Cars are identified by a car ID and contain details like make, model, and rental price. Reservations are associated with users and cars, recording information such as pickup/drop-off dates and rental duration.

Online Course Platform: (Ariganyira Cyrus)
Consider designing a database schema for an online course platform. This platform allows users to enroll in courses, access course materials, and participate in discussions. Each user has a unique user ID, username, and email address. Courses are identified by a course ID and contain details like title, description, and instructor. Enrollments record user participation in courses and are associated with both user IDs and course IDs.

Inventory Management System for Manufacturing: (Kuteesa Jonathan)
Imagine designing a database schema for an inventory management system used in manufacturing. This system allows businesses to track raw materials, monitor inventory levels, and manage production orders. Each material has a unique material ID, name, and supplier information. Inventory records track quantities of materials on hand and are associated with material IDs. Production orders contain details like order ID, quantity required, and production date.

Employee Time Tracking System: (Nicole Mbabazi)
You're tasked with designing a database schema for an employee time tracking system. This system allows businesses to record employee work hours, track overtime, and generate payroll reports. Each employee has a unique employee ID, name, and department. Time entries record clockin/clock-out times for employees and are associated with employee IDs and dates. Payroll records contain information such as wages, deductions, and payment dates.

Social Event Planning Platform: (Ndyaga Isaac)
Suppose you're developing a database schema for a social event planning platform. This platform allows users to create events, send invitations, and manage guest lists. Each user has a unique user ID, username, and email address. Events are identified by an event ID and contain details like title, date, and location. Invitations record guest responses and are associated with event IDs and user IDs.

Healthcare Management System: (Asingwire Owen)
Imagine designing a database schema for a healthcare management system used in hospitals. This system allows healthcare providers to manage patient records, schedule appointments, and track medical treatments. Each patient has a unique patient ID, name, and medical history. Appointments are identified by an appointment ID and contain details like date, time, and reason for visit. Treatments record medical procedures and are associated with patient IDs and appointment IDs.

Online Retail Platform: (Muzahura Joshua)
Consider designing a database schema for an online retail platform. This platform allows users to browse products, add items to their shopping carts, and make purchases. Each user has a unique user ID, username, and email address. Products are identified by a product ID and contain details like name, price, and description. Shopping carts record items added by users and are associated with user IDs.

Travel Expense Management System: (Namwemezi Paraside)
Suppose you're tasked with designing a database schema for a travel expense management system used by businesses. This system allows employees to submit expense reports, track reimbursements, and analyze

spending. Each employee has a unique employee ID, name, and department. Expense reports are identified by a report ID and contain details like date, purpose, and expense categories. Reimbursements record payments made to employees and are associated with employee IDs and report IDs.

Best of Luck!