HW#1

Information Management; EPPS 6354; Spring 2024

Tamnala Briggs-Megafu

Name/describe 3 applications that employ database management to store and access persistent data

1. **Online Retail System:**
   - *Description:* An e-commerce platform that relies on a database to store and manage product information, customer details, order history, and inventory data.
   - *Functions:* Supports order processing, customer management, and inventory tracking.
2. **Hospital Management System:**
   - *Description:* Software used in healthcare settings that utilizes a database to store and manage patient records, medical histories, treatment plans, and other healthcare-related data.
   - *Functions:* Enables quick access to patient information, aids decision-making, and maintains comprehensive patient care records.
3. **Human Resources Information System (HRIS):**
   - *Description:* Software application used in HR departments that depends on a database to store and manage employee information, payroll data, attendance records, and performance evaluations.
   - *Functions:* Facilitates HR processes such as recruitment, employee development, and payroll processing by ensuring the integrity and security of employee data.

Q2. Propose 3 applications in domain projects to include – i). purpose, ii). functions, and iii). Simple interface design

Crime Analytics and Mapping System: This application serves criminologists, law enforcement, and policymakers by providing a user-friendly platform to analyze and visualize crime data, helping them make informed decisions to enhance public safety.

- ***Purpose****:* To analyze and visualize crime data for better understanding and decision-making in criminology and law enforcement.

- ***Functions:***
  - Crime Data Input: Allows input of crime incidents with details like location, type, and time.
  - Analytics and Trend Analysis: Generates statistical reports and visualizations to identify crime trends and patterns.
  - Geospatial Mapping: Displays crime incidents on a map for spatial analysis.
  - Predictive Analytics: Utilizes historical data to predict potential high-crime areas and times.

- ***Simple Interface Design:***
  - Crime Dashboard: Overview of recent crime incidents and statistical summaries.
  - Crime Input Form: Intuitive for entering new crime data with dropdowns and location selection.
  - Analytics Section: Visual representations like charts and graphs depicting crime trends.
  - Map Interface: Interactive map displaying crime incidents with filtering options for specific criteria.

Q2.

Clinic Appointment Scheduler: This application aims to enhance the patient experience by providing a convenient and user-friendly platform for appointment scheduling, minimizing wait times, and improving overall clinic efficiency.

- ***Purpose****:* To efficiently manage and streamline the process of scheduling patient appointments in a medical clinic.

- ***Functions:***
  - Appointment Booking: Patients can schedule appointments online or through the clinic's reception.
  - Availability Calendar: Displays the availability of doctors and time slots for easy appointment selection.
  - Patient Registration: Collects and stores patient information, including medical history and contact details.
  - Automated Reminders: Sends appointment reminders via SMS or email to reduce no-shows.

- ***Simple Interface Design:***
  - Appointment Calendar: An easy-to-navigate calendar showing available slots and booked appointments.
  - Booking Form: Intuitive form for patients to enter their details, choose a preferred time, and specify the reason for the visit.
  - Patient Profile: Secure portal for patients to view and update their information.
  - Notifications: Confirmation messages and automated reminders for upcoming appointments.

Q2

Library Management System: Provide librarians with a user-friendly platform to manage library resources efficiently, simplify the borrowing process for patrons, and maintain an organized catalog of books.

- ***Purpose****:* To efficiently manage library resources, streamline operations, and provide an organized system for library staff and patrons.

- ***Functions****:*
  - Catalog Management: Add, update, and organize books with details such as title, author, genre, and ISBN.
  - Borrower Management: Maintain records of library members, track borrowing history, and issue/renew library cards.
  - Check-In/Check-Out: Streamline the process of borrowing and returning books, complete with due date notifications.
  - Inventory Tracking: Monitor and manage the library's inventory, including stock levels and location of books.

- ***Simple Interface Design****:*
  - Dashboard: Overview of library statistics, recent activities, and quick access to essential functions.
  - Catalog View: Searchable and filterable list of books with cover images, title, and availability status.
  - Borrower Management: User-friendly interface to add or update borrower information with a clear borrowing history.
  - Transactions Log: Display of recent check-ins, check-outs, and any outstanding fines.

Q 6. Describe 3 tables that might be used to store information in a social network/social media system such as Twitter or Reddit

These tables work together to create a relational database that captures user information, user-generated content (tweets), and the relationships between users (followers/followees) in a social media system like Twitter.

1. **User Table:**
    - ***Fields****:*
        - UserID (Primary Key)
        - Username
        - Email
        - Password (hashed)
        - Full Name
        - Bio/Description
        - Profile Picture URL
        - Registration Date
        - Last Login Timestamp
    - ***Purpose:***
        - Stores information about each user on the platform.
        - Facilitates user authentication and authorization.
        - Supports the display of user profiles.

Q6.

2. Tweet Table:

- ***Fields****:*
  - TweetID (Primary Key)
  - UserID (Foreign Key referencing User Table)
  - Tweet Content
  - Timestamp of the Tweet
  - Number of Likes
  - Number of Retweets
  - Media Attachments (if any)
  - Hashtags or Tags
- ***Purpose:***
  - Stores individual tweets made by users.
  - Facilitates the display of tweets on the user's timeline.
  - Supports engagement metrics such as likes and retweets.

Q6.

3. Followers Table:

- *Fields:*
  - FollowerID (Foreign Key referencing User Table)
  - FolloweeID (Foreign Key referencing User Table)
  - Timestamp of the Follow Action
- *Purpose:*
  - Manages the relationships between users (followers/followees).
  - Enables the "following" system.
  - Supports the generation of personalized timelines based on followed users' tweets.

Q3. Why is data mining needed if data can be retrieved efficiently and effectively?

1. While efficient data retrieval is crucial for accessing known information, data mining is needed to discover new insights, predict future trends, and optimize decision-making processes based on patterns and associations within large datasets. It adds a layer of intelligence and discovery to data analysis, enabling organizations to make more informed and strategic decisions.