Assignment 1

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Abstract

Assignment 1

1. Name and describe three applications you have used that employed a database system to store and access persistent data. (e.g. airlines, online trade, banking, university system)

UTD university systems, such as Orion or Blackboard – My Insurance company application and my medical records – IRS and tax return process

2. Propose three applications in domain projects (e.g. criminology, economics, brain science, etc.)

1. Healthcare: Disease Prediction and Diagnosis Assistant

Purpose:

To assist doctors and healthcare providers in predicting diseases based on patient medical history and records.

Functions:

Analyzes patient data, lab results, and lifestyle factors to predict potential diseases.

Simple Interface Design:

Patient Dashboard, to showcase patient's data such as medical records

Symptom Checker, where suggests solutions based on conditions

Doctor's Portal, where doctors can leave notes for the patients

2. Environmental Science: Air Quality Monitoring and Prediction System

Purpose:

To monitor real-time air quality levels and predict future air quality trends, helping governments, researchers, and individuals take necessary actions.

Functions:

Collects data from weather stations

Uses machine learning to predict air quality trends

Provides alerts for hazardous air quality

Simple Interface Design:

Live Air Quality Map

Forecasting Dashboard

Personalized Alerts

3. Education: AI-Powered Personalized Learning Assistant

Purpose:

To create a customized learning experience for students by analyzing their learning styles

Functions:

Tracks student progress and adapts lesson plans based on learning patterns.

Simple Interface Design:

Student Dashboard

Adaptive Learning Module (difficulty tracking system)

Virtual Ai Tutor: Answers questions and suggests study strategies based on student needs.

3. If data can be retrieved efficiently and effectively, why data mining is needed?

Because Data is likely raw information in most cases. Data mining can turn that raw information into actionable data. Also, data mining helps with prediction, by analyzing the trends and patterns.

4. What are the things current database system cannot do?

I believe nowadays databases are powerful but still struggling in handling unstructured data, real time processing at a massive scale, and combining data from different sources smoothly. Future advancements will likely focus on hybrid AI-driven databases.

5. Describe at least three tables that might be used to store information in a social network/social

media system such as Twitter or Reddit.

Users Table: Stores user information, including login credentials, profile details, and account settings.

Followers Table: Stores relationships between users, such as followers (Twitter) or subreddit subscriptions

Posts Table: Stores user-generated posts, including tweets, comments, or Reddit posts.