

Assignment 1

Ashleigh Frank

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Question 1: Name and describe three applications you have used that employed a database system to store and access persistent data.

1. Airlines: Check flight availability, pricing, flight schedules, passenger data. Looks at popularity of flights (increase or decrease flight cost). Generates boarding passes, process of payment, passenger & crew information (checked luggage, seat availability).
 - a. Changes of flights
2. Amazon: product listing, orders, inventory, and transaction history.
 - a. Personalized recommendations
3. Hospital systems: patient records, medical history, treatment plans, medication information and scheduling
 - a. Messaging on an app
 - b. Look at ordered test and results
 - c. Ask for refill in medication

Question 2:

Propose three applications in domain projects. Include: i. Purpose ii. Functions iii. Simple interface design

1. **Economic and policy analysis platform**
 - a. Provide economist and policy makers with tools for economic forecasting, policy evaluation. Assist in decision making process
 - b. Utilize econometric models and forecasting techniques to predict economic trends (GDP, inflation), conduct scenario analysis, generates visualization, reports to communicate policy recommendations
 - c. Data dashboard, analysis tools, policy evaluation report
2. **National Parks and Ecosystem Monitoring**
 - a. Monitor and manage national parks, ecosystem health and engage public with conservation awareness
 - b. Ecosystem monitoring: collect, integrate and monitor data. Analyze trends and patterns. Visitor engagement: interactive maps, self-guided tours with education content, allows visitors to report wildlife sightings, conservation concerns
 - c. Home screen, visitor engagement section, ecosystem monitoring section, reporting tool, alerts and notifications
3. **Cultural Heritage Preservation Platform**
 - a. Preserve and promote cultural heritage sites, artifacts, traditions. Provide digital platform for documenting, sharing, and preservation
 - b. Digitize cultural heritage sites, accessible to researchers, scholars and public, interactive virtual tours and 3D reconstructions, community participation
 - c. Educational resources, virtual tour and 3D exhibits section, community engagement, collaboration with cultural institutions

Question 3:

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

1. To discover patterns and trends that might not be apparent
2. Data exploration to uncover interesting relationships and anomalies

Question 6: Describe at least three tables that might be used to store information in a social-network/social media system.

1. User Table:
 - a. Username
 - b. Emails
 - c. Passwords
 - d. Name
 - e. Join Date
2. Post Table
 - a. PostID
 - b. Username
 - c. Content
 - d. Timestamp
 - e. Likes
 - f. Comments
3. Comment Table
 - a. Username
 - b. PostID
 - c. Content
 - d. Timestamp