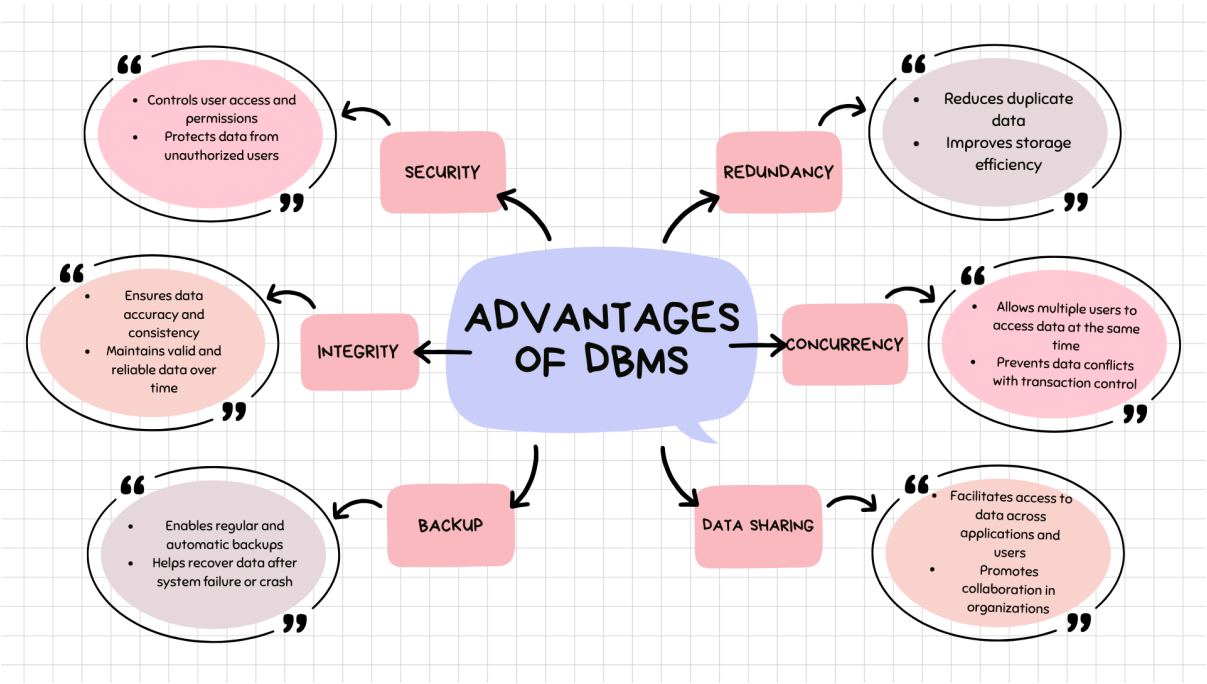
Database Course Documentation

1. Comparison Assignment: Flat File Systems vs. Relational Databases

Feature	Flat File Systems	Relational Databases
Structure	Simple text-based storage (CSV, TXT)	Organized in tables with rows and columns
Redundancy	High redundancy due to data repetition	Minimal redundancy through normalization
Relationships	No inherent support for relationships	Supports relationships via foreign keys
Example Usage	Basic spreadsheets, config files	Inventory systems, banking databases
Drawbacks	Difficult to manage, error-prone, no security	Complex setup, needs maintenance

2. DBMS Advantages – Mind Map



Advantages of DBMS:

- **Security**: Controls user access
- **Integrity**: Ensures data accuracy
- **Backup**: Allows recovery from failures
- **Redundancy**: Reduces duplication
- **Concurrency**: Supports multi-user environment
- **Data Sharing**: Easy sharing across apps

Tools used: Canva

3. Roles in a Database System

System Analyst

- Gathers user requirements
- Analyzes business processes
- Translates needs into technical requirements

Database Designer

- Designs the database schema
- Ensures normalization and efficiency

Database Developer

- Implements database code (SQL, stored procedures)
- Ensures correct logic and data handling

Database Administrator (DBA)

- Manages access control, backups, tunin
- Maintains availability and performance

Application Developer

- Builds front-end or apps that connect to DB
- Uses APIs, SQL queries, and ORM tools

BI Developer

- Creates dashboards and reports
- Extracts insights from raw data

4. Types of Databases

Relational vs. Non-Relational

Type	Description	Examples	Use Cases
Relational	Structured, table-based	MySQL, PostgreSQL	Banking, HR, inventory systems
Non-Relational	Flexible schema (document, key-value)	MongoDB, Cassandra	IoT, logs, social media platforms

Centralized vs. Distributed vs. Cloud

Type	Description	Use Cases
Centralized	Single server for all data	Small business internal tools
Distributed	Data stored across multiple sites/servers	Global apps, telecom databases
Cloud	Data stored on remote cloud infrastructure	SaaS apps, scalable web systems

5. Cloud Storage and Databases

What is Cloud Storage?

Cloud storage refers to storing data on remote servers accessed via the internet. It provides scalability, availability, and cost efficiency.

How It Supports Database Functionality

- Enables global access
- Supports automated backups
- Elastic scalability for demand spikes

Advantages of Cloud Databases

- Managed services (no need for manual setup)
- High availability and durability
- Easy integration with cloud analytics

Examples:

- **Azure SQL**: Scalable relational database
- **Amazon RDS**: Supports multiple DB engines
- **Google Cloud Spanner**: Global distributed DB

Disadvantages

- Dependency on internet connectivity
- Security concerns

- Cost can grow with scale

Submission Checklist

- GitHub Repo created and named `Database Course Documentation`
- Report file added as `README.md`
- Mind Map image uploaded
- Structured sections using headings and visuals
- No copy-paste content without understanding