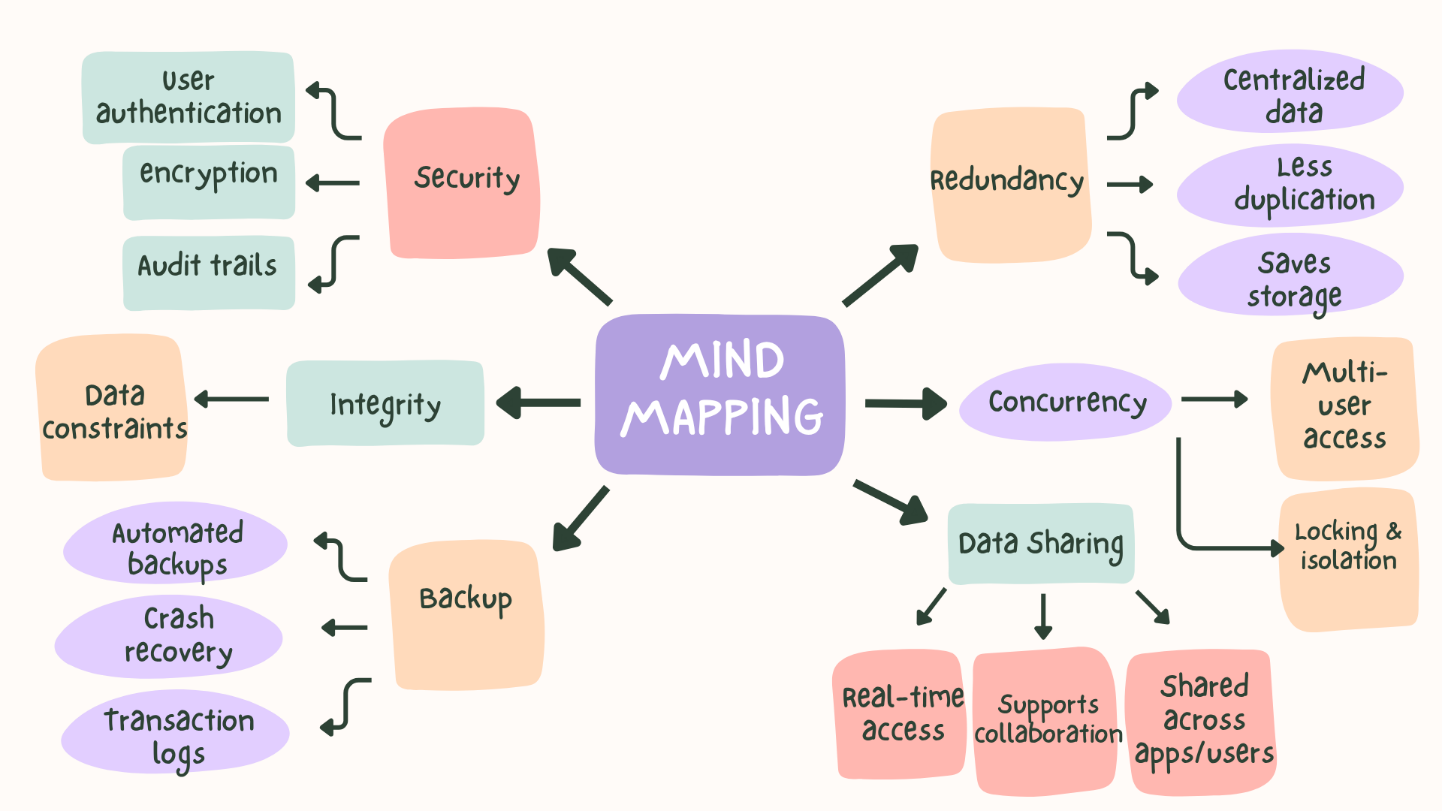
1. **Comparison: Flat File Systems vs. Relational Databases:**

|  |  |  |
| --- | --- | --- |
| Feature | Flat File Systems | Relational Databases |
| Structure | Data stored in a signal table or text file | Data stored in multiple related tables |
| Data Redundancy | duplicate data appears in multiple files | normalization minimizes redundancy |
| Relationships | all data kept separately | Supports relationships using primary and foreign keys |
| Example Usage | Small applications (configuration files) | Business applications (banking systems) |
| Drawbacks | Hard to update, lacks security and poor scalability | More complex setup, requires database software and management |

1. **DBMS Advantages – Mind Map:**
2. **Roles in a Database System:**

|  |  |  |
| --- | --- | --- |
|  | Role | Key Responsibilities: |
| System Analyst | Bridge between business needs and technical solutions | * Gathers and analyses business requirements from stakeholders * Identifies data needs and system workflows * Creates functional specifications and use cases |
| Database Designer | Architect of the database structure | * Designs the logical and physical data model * Applies normalization to reduce redundancy * Defines constraints, data types, and referential integrity rules |
| Database Developer | Builder of database logic and objects | * Writes and optimizes SQL scripts * Implements the database schema designed |
| Database Administrator (DBA) | Guardian of the database environment | * Installs, configures, and maintains DBMS software * Manages user accounts, roles, and security permissions * Performs backups, recovery, and disaster planning |
| Application Developer | Creator of software that uses the database | * Develops front-end or back-end applications * Writes code to query, insert, update, or delete data * Collaborates with Database Developers |
| BI (Business Intelligence) Developer | Data storyteller and analytics enabler | * Creates dashboards, reports, and visualizations * Transforms raw operational data into actionable business insights * Works with aggregated, historical, and dimensional data models |