Creating a Database Guide

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Definition of key concepts

- **Database**: A structured set of data held in a computer, especially one that is accessible in various ways
- **Table**: A set of data elements (values) that is organized using a model of vertical columns and horizontal rows.
- **Schema**: The organization of data as a blueprint of how the database is constructed
- **Primary Key**: A unique identifier for a record in a table.
- **Foreign Key**: A field in a table that is the primary key in another table, used to link two tables.
- **Index**: A database object that speeds up the retrieval of rows by using a pointer.
- **Entity-Relationship Diagram (ERD):** A visual representation of the entities within a database and their relationships.
- **Normalisation**: The process of organizing data to reduce redundancy and inconsistency

Step-by-step	Required action
Requirement Analysis	Identifying what data needs to be stored and how it will be used
Schema Design	Planning the tables and relationship
Normalization	Ensuring the schema is efficient and reduces redundance
Defining Keys	Assigning primary and foreign keys appropriately
Creating Table	Using SQL or a database management tool to create tables as per the schema
Indexing	Adding indexes to improve query performance
Testing and Optimization	Ensuring the database performs well and making necessary adjustments.
Security Considerations	Implementing user roles and permissions to protect data

Two key principles of the database design process:

- Redundant data is bad as it affects the quality of data
- Correctness and completeness of data is crucial

Normalisation rules:

- Each cell must contain a single value
- All data must depend on primary (or foreigner) keys
- The primary key must fully define non-key column