**PART ONE**

Web Applications and SQL

1. Summary

They provide clear visualization of a database's structure, helping in the design and translation of complex data relationships. They facilitate normalization, ensuring efficient data organization and minimizing redundancy which are done by Entity relationship Diagrams. Also they serve as a valuable documentation for database maintenance and future modifications.

1. Role of managing data behind the scenes in Web Applications

Structured Query Language is essential for managing data behind the scenes. It is used to store, retrieve, update, and delete data within a relational database in web applications. For example SQL is used in an online to manage product information, user accounts, and order details, allowing for efficient data handling and seamless user interactions.

1. Benefits of Using SQL for Web Applications
2. Efficiency - It allows for quick and efficient querying and updating of data, ensuring that web applications can handle large volumes of transactions and user interactions smoothly.
3. Data Organization - It helps in structuring data in a systematic manner using tables, relationships, and constraints, which maintains data integrity and reduces redundancy.
4. Data Retrieval Capabilities - It provides powerful tools for retrieving specific data through complex queries, enabling web applications to dynamically display relevant information to users based on their requests.
5. Database Management Systems
6. Oracle Database
7. MySQL
8. PostreSQL

**PART TWO**

A database table is a structured set of data held in a computer or server organized into rows and columns. Each row in a table represents a unique record, while each column represents a specific attribute of the record. Similar to a spreadsheet, a database table allows for the systematic organization of information, making data retrieval and manipulation efficient and intuitive.

Columns are vertical divisions in a table that categorize data into specific types or attributes. Each column contains data of a single type and describes a particular property of the records in the table. For example, in a table storing information about employees, columns might include "Employee ID" (numbers), "Name" (text), and "Hire Date" (dates). These columns help to structure the data in a way that makes it easy to locate and understand specific pieces of information.

Data Types Importance of Data Types

Data types are crucial in a database because they define the kind of data that can be stored in each column, ensuring data integrity and efficient storage. By specifying data types, databases can enforce rules that help maintain the accuracy and consistency of the data, optimize storage, and improve query performance.

Common Data Types

Text - This data type is used to store alphanumeric characters, including letters, numbers, and symbols. Text data types are essential for storing names, addresses, descriptions, and other similar information. For example, a "Name" column in an employee database would use a text data type to store employee names.

Number - This data type is used to store numeric values, which can be integers or floating-point numbers. Number data types are important for performing calculations and storing quantitative information such as salaries, ages, or inventory counts. For instance, an "Employee ID" column would use a number data type to uniquely identify each employee.

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| --- | --- | --- | --- |
| Expense\_ID | Amount | Date | Category |
|  |  |  |  |

Date - This data type is used to store dates and times. Date data types allow for efficient storage and manipulation of temporal data, enabling operations like sorting by date, calculating the duration between dates, or filtering records based on specific time periods. For example, a "Hire Date" column w

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ould use a date data type to record the date each employee was hired.