Part 1

1. Imagine a dynamic website like an online store. How do you think SQL plays a role in managing data behind the scenes? Consider how product information, user accounts, and order details might be stored and accessed.

In an online store SQL can be useful in maintaining product information, its prices and other relevant descriptions of the said product.

SQL allows a user to add a table and other relevant information if the product in the store has maybe an addition to its flavors or deletion if something that was once there was removed.

SQL can also limit data loss and maintains its private data through data constrains using different types of keys such as primary keys and foreign keys.

To access an online store, a user must create an account with a name, password and sometimes an email. These information can be stored in databases within SQL.

When an order is placed, records are kept in the SQL database with the description of the order placed and the product’s information.

1. Write a short explanation (3-5 sentences) in your document about the role of SQL in web applications.

SQL serves as data manager and is used to manipulate data stored in relational databases.

It allows a user access to the information and they can store and retrieve given data easily from usernames, tables and essential information of a user that might be stored in the database.

It also offers security to users information to the people interacting with the web application.

1. List 3 benefits of using SQL for web applications.
2. SQL are designed to handle large amounts of data and can operate with high traffic web applications.
3. SQL databases provide a powerful and flexible querying language that allows developers to manipulate data.
4. SQL ensures data integrity and consistency by enforcing rules and contraints on the data.
5. Think about efficiency, data organization, and data retrieval capabilities. Briefly explain each benefit in your document (1-2 sentences per benefit).
6. SQL databases enable efficient data storage and retrieval by minimizing data redundancy and optimizing data access.
7. SQL databases provide a structured and standardized way of organizing data making it easier to manage and maintain large datasets.
8. SQL databases offer powerful querying capabilities allowing developers to easily retrieve specific data, perform complex data analysis and generate reports.
9. List any 3 Database Management Systems.
10. MySQL
11. PostgreSQL
12. Microsoft SQL Server

Part 2

1. Think about how data is organized in rows and columns. In your document, define a database table and explain its similarity to a spreadsheet (2-3 sentences).

A database table is a collection of related data organized into rows and columns similar to a spreadsheet.

Each row (record/tuple) represents a single entry/instance of data while each column (field/attribute) represents a specific piece of information about that entry. This is similar to the spreadsheet

1. Consider different types of data like text, numbers, and dates. Define "columns" and provide an example with an explanation (2-3 sentences) in your document. Data Types: Why are data types important in a database? Briefly explain 3 common data types (e.g., Text, Number, Date).

Columns are vertical lists of cells that contain data of a specific type such as text, numbers or dates. An example is in a ‘Course’ table, a column named ‘Engineering’ would contain numerical data such as period of study and would be defined as a numerical data type ensuring only numbers are entered in this column.

Data types are important as they define the type of data to be stored in a column ensuring data consistency, accuracy and efficiency.

Text: It is used to store character strings such as names, addresses and descriptions.

Number: It is used to store numerical values such as integers or decimals.

Date: It is used to store dates and timestamps such as birthdays and anniversaries.

1. Think about how data types ensure data integrity and efficient storage. Explain the importance of data types and provide brief explanations of 3 common types (2-3 sentences each) in your document.

Data types ensure data integrity and efficient storage in databases preventing errors, inconsistencies and inaccuracy.

They also optimize storage and querying.

1. Integer: It is used to store whole numbers either positive, negative or zero. It is commonly used for columns that require counting or identification such as ID and age or quantity. They ensure that only whole numbers can be entered preventing inconsistencies and errors.
2. Variable Character: It is used to store character strings of varying lengths such as names, addresses or descriptions and is commonly used for columns that require alphanumerical data like emails. They optimize data by allocating only the necessary space for each string.
3. Date-time: It is used to store dates and timestamps such birthdays and is commonly used for columns that require temporal data like ‘Order Date’. They ensure only valid sates and times can be entered.

Part 3

1. We'll be building an Expense Tracker application. What kind of data do you think we'll need to track? List at least 5 data points relevant to our project.

* Consider information like expense amount, date, and category.
* List your identified data points in your document.

1. Expense amount
2. Date
3. Category
4. Description
5. Payment method

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| --- | --- | --- |
|  | EXPENSES |  |
| Expense amount | INT | 1200 |
| Date | DATE | 2024-07-01 |
| Category | TEXT | Dinner |
| Description | TEXT | Gen-Z KFC |
| Payment method | TEXT | Cash |