* 1. **In a single Word document, summarize your findings in a short paragraph (3-5 sentences). Web Applications:**

For every dynamic web application, especially an online website, here is how SQL plays a vital role, when user or the target customer access through the website, in the database there is a table usually with rows, and columns, that will store user information such as names,email,cellphone, and address,and empty slot for cart information.

When user add products into the cart, the cart slot get filled with the product details such price,details,reviews,quantity, after SQL has fetched data from database about the product to user, doing so it allows user to decide whether to continue or not based on the information fetched from the database.

SQL manages all the information in the database when the developer, updates by removing or inserting data based on the relevancy of the products available.

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

To me SQL is like API, the function is to fetch data from the database, but very different to API because it can allow the developer to update,insert nor to delete information on the web application, developer in SQL have large number scale of role on how to serve the data to customers without compromising anything.

1.3. **List 3 benefits of using SQL for web applications.**

**Flexibility and Expressiveness**- SQL is so rich which features and abilities that developers can get their hands on and work the magic e.g Querying, Manipulation, and managing data, allowing user to also join data in any way available, which in all allows developers to enable good functionalities, while the web application is not disturbed.

**Scalability**- SQL is unique, I mean that it can operate very large amount of data at the same time without breaking down, I mean that SQL at the same time can supply very large number of severs to different clients without tearing down, through the process of replication, it allows the web application to adapt and accommodate new users, and the data requirement.

**Data Integrity**- in the process of reducing data errors and inaccuracy SQL have a built in feature that allows relationship across the database, foreign keys, primary keys, all is to ensure the consistency of data within the database.

1.4. **Think about efficiency, data organization, and data retrieval capabilities. Briefly explain each benefit in your document (1-2 sentences per benefit).**

**Data Retrieval Capabilities**- SQL is unique when it comes to data retrieval, through it query, developers can fetch data in very complicated database and be able to combine it with easy, and in that manner data can be filtered,joint, and sorted with ease.

**Efficiency**- the database is very much optimized when it comes to storing data,fetching and modification, the caches, indexing and query mechanism within SQL ensures that the response time when user asks for specific product data is fast and reliable and so that issues such as online traffic it does not affect users.

**Data Organization**- SQL database is embedded with a strong structure that allows developers to organize data in table manner, with rows and columns, which promotes logic and sense when it comes to data fetching,storing, manipulation and modification, and to reduce data duplicates.

1.5. **List any 3 Database Management Systems.**

- MySQL

- Oracle Database

- Microsoft SQL Server

Question 2.1: **Tables**

The table in the database is designed to collect data and organize it into manners of rows and columns, each row displaying a single record of a certain event, while the column will display a specific element of the event that links to the record of the row, the presentation of SQL database is very similar to one of spreadsheet, rows and columns have similar function in SQL and Spreadsheet, allowing developers to store data, fetch and manipulate, and both in tubular format.

Question 2.2: **Columns**

Columns is a specific table representation in database, that is usually displaying the data stored in that field, columns associates with data that is usually stored in the column format e.g Name,salary,Income.

**Data types** are type of data that are stored in SQL database, and each data have it own value, unit of representation, some data are stored in integers(real number), float(decimal number), text(words), date and other related.

**Text** are type of data stored and represented by collection of characters(variables), can be name, address or can accommodate most length of characters.

**Number**, type of data in the database represented by integers or float and usually used for mathematical purposes.

**Date,** type of data that is stored and represent a certain record but using the date format, which can also be time, sometimes developers can manipulate it.

Question 2.3: **Data Types**

Data type plays an important role when it comes to data storage in the database, because most of the information in the database is data stored in different format that can be manipulated and modified.

**Text** are type of data stored and represented by collection of characters(variables), can be name, address or can accommodate most length of characters.

**Number**, type of data in the database represented by integers or float and usually used for mathematical purposes.

**Date,** type of data that is stored and represent a certain record but using the date format, which can also be time, sometimes developers can manipulate it.

**PART 3:** Expense Tracker Database Design

3.1 3.1. **Planning: 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.**

**Expense Amount**- The amount I will have to allocate for my expense.

**Date of expense**- Specific dates that I have to record every-time I got out to buy something.

**Expense Method**- classification of things I spend on, like grocery, rent, loan, utilities and other stuff.

**Payment Method**- Most method is either cash paying or using credit card.

**Notes**- Maybe a list of items I buy every time.

3.2. **Tables: Considering the data points you listed, design a basic database schema with one main table (likely named "Expenses").**

The columns that I will need I think for my project are just like few, like to include the column name, Data Type and Description where I will have to enter required data as I have explained above.

|  |  |  |
| --- | --- | --- |
| Expense | Data Type | Description |

|  |  |  |
| --- | --- | --- |
| Amount | DECIMAL | Amount spent |
| Date | DATE | Specific date |
| Payment Method | VARCHAR | Cash/Card |
| Notes | TEXT | Grocery list |

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| --- |
|  |

|  |  |  |
| --- | --- | --- |
| Category | VARCHAR | Type of expense |

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| --- |
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