Part 1: Understanding SQL-Research

1.1 Web Applications:

- Web app is a that is stored in a remote server and is delivered to the user over the internet through a browser interface.
- For a web application to operate it requires a web server to manage requests that come from the client, application server to complete the requested tasks and a database to store the necessary information.
- The benefits of a web application include: users don't need to install the app, multiple users can access the same version of the application, users can access the applications through multiple browsers and platforms.

1.2 Role of SQL in Web Applications

- Display of user data: Retrieve data from the database.
- Data mining: Extracting information such as updates events, monitoring tables and database activities and retrieve information from websites.
- Data management: SQL helps handle, access and process large amounts of data without causing harm to the end user.
- Data manipulation: Allows the user to make changes to the data within a shorter time.

1.3 Benefits of using SQL in Web Applications

- Easy retrieval and manipulation of data
- Wide adoption and reliable community support
- Cost effective

1.4 Explanation: Efficiency, data organization and retrieval capability benefits of SQL

- Efficiency: SQL databases stand out by its capability and scalability of handling large volumes of data with compromising its performance.
- Data organization: SQL simplicity and flexibility querying capabilities enables the user to perform complex tasks and organize data to optimize operations.
- Retrieval capability: SQL offers and intuitive and straightforward method for retrieving and manipulating data from databases.

1.5 Database Management Systems (list)

- Window Server SQL
- Oracle
- MySQL
- PostgreSQL

Part 2: Database Fundamentals- Tables

2.1 Tables: Define a database table and explain its similarities to a spreadsheet.

- Database table: Is a set of data values using a model of vertical columns (identifiable by name) and horizontal rows, cell is the unit where columns and rows intersect.
- Similarities:
    - They both store data in a tabular form
    - Both can store numerical and qualitative data

2.2 Columns: Define a column and give an example with an explanation

- Column: Is a set of data values of a particular type or attributes.

Data types: Importance of data types in a database. Explain 3 common data types (date, number and text)

- String data types; CHAR, VARCHAR, BLOB
- Date and Time Data Types; Datetime, Date, Timestamp
- Numerical data types; integer, float

Data types help in enforcing constraints and referential integrity checks. Constraints ensures data rules are adhered to and prevent entry of inconsistent or invalid data while referential integrity ensures that relationships between different tables are maintained correctly , avoiding orphaned or disconnected data.

Part 3: Expense Tracker Database Design – Planning and Design

3.1 List at least 5 data points

- Date
- Amount paid
- Payment method
- Users
- Email
- Expense category

3.2 Tables

See attached document.