Week one database assignment

SQL (Structured Query Language) is a standard programming language used to manage and manipulate relational databases. Its primary purposes include:

- Data Retrieval: Querying the database to retrieve specific information.
- Data Manipulation: Inserting, updating, and deleting records.
- Data Definition: Creating and modifying database schemas (tables, views, etc.).
- Data Control**:** Managing permissions and access control.

In web applications, SQL is often used for:

- User Authentication: Storing user credentials and session information.
- Content Management: Managing data for blogs, articles, or other content types.
- Transaction Handling: Tracking purchases, expenses, or any financial records.
- Analytics: Running queries to analyze usage patterns or generate reports.

Fundamental Components of a Database

1. Tables**:** Structures that hold data in rows and columns. Each table represents a different entity (e.g., users, transactions).
2. Columns**:** Attributes of the table that define the type of data stored (e.g., user name, expense amount).
3. Data Types**:** Specify the data that can be stored in a column (e.g., integer, varchar, date).

Expense Tracker project

```
CREATE DATABASE expense_tracker;

USE expense_tracker;

CREATE TABLE Users (
    user_id INT PRIMARY KEY AUTO_INCREMENT,
    username VARCHAR(50) UNIQUE NOT NULL,
    password_hash VARCHAR(255) NOT NULL,
    email VARCHAR(100) UNIQUE NOT NULL,
    created_at DATETIME DEFAULT CURRENT_TIMESTAMP
);


CREATE TABLE Categories (
    category_id INT PRIMARY KEY AUTO_INCREMENT,
    user_id INT,
```

```
    category_name VARCHAR(50) NOT NULL,
    created_at DATETIME DEFAULT CURRENT_TIMESTAMP,
    FOREIGN KEY (user_id) REFERENCES Users(user_id) ON DELETE CASCADE
);

CREATE TABLE Expenses (
    expense_id INT PRIMARY KEY AUTO_INCREMENT,
    user_id INT,
    amount DECIMAL(10, 2) NOT NULL,
    category_id INT,
    description VARCHAR(255),
    date DATE NOT NULL,
    created_at DATETIME DEFAULT CURRENT_TIMESTAMP,
    FOREIGN KEY (user_id) REFERENCES Users(user_id) ON DELETE CASCADE,
    FOREIGN KEY (category_id) REFERENCES Categories(category_id) ON DELETE SET NULL
);
```