

```

-- Create the database (adjust the name if needed)
CREATE DATABASE IF NOT EXISTS expense_tracker;

-- Use the expense_tracker database
USE expense_tracker;

-- Create the Expenses table
CREATE TABLE IF NOT EXISTS Expenses (
    expense_id INT PRIMARY KEY AUTO_INCREMENT,
    amount DECIMAL(10,2) NOT NULL,
    date DATE NOT NULL,
    category VARCHAR(50) NOT NULL
);

-- Function to generate random date within a specific range (modify as needed)
DELIMITER //

CREATE FUNCTION GetRandomDate(startDate DATE, endDate DATE)
RETURNS DATE
READS SQL DATA
DETERMINISTIC
BEGIN
    DECLARE randomDays INT;
    SET randomDays = FLOOR(RAND() * (DATEDIFF(endDate, startDate) + 1));
    RETURN DATE_ADD(startDate, INTERVAL randomDays DAY);
END; //

DELIMITER ;

-- Stored Procedure to insert sample data with random dates and categories (categories
can be modified)
DELIMITER //

CREATE PROCEDURE InsertSampleData()
BEGIN
    DECLARE counter INT DEFAULT 1;

    WHILE counter <= 20 DO
        INSERT INTO Expenses (amount, date, category)
        VALUES (FLOOR(10 + RAND() * 100),
            GetRandomDate(DATE_SUB(CURDATE(), INTERVAL 4 YEAR), CURDATE()), --
Random date within the last 4 years
            CASE WHEN counter % 4 = 0 THEN 'Groceries'
                WHEN counter % 4 = 1 THEN 'Entertainment'
                WHEN counter % 4 = 2 THEN 'Transportation'
                ELSE 'Other'
            END);
        SET counter = counter + 1;
    END WHILE;

```

```
END; //
```

```
DELIMITER ;
```

```
-- Call the procedure to insert sample data  
CALL InsertSampleData();
```

```
-- Drop the functions and procedures if they are no longer needed  
DROP PROCEDURE IF EXISTS InsertSampleData;  
DROP FUNCTION IF EXISTS GetRandomDate;
```

Part 1: Retrieving Data with SELECT

1.1 Retrieving All Expenses

To retrieve all data points (columns) from the "Expenses" table:

```
SELECT * FROM Expenses;
```

1.2 Specific Columns

To select only the "date," "category," and "amount" columns:

```
SELECT date, category, amount FROM Expenses;
```

1.3 Filtering by Date Range

To retrieve expenses charged between January 1, 2021, and December 15, 2024:

```
SELECT date, category, amount  
  
FROM Expenses  
  
WHERE date BETWEEN '2021-01-01' AND '2024-12-15';
```

Part 2: Filtering with WHERE Clause

2.1 Filtering by Category

To find all expenses belonging to the "Entertainment" category:

```
SELECT * FROM Expenses  
WHERE category = 'Entertainment';
```

2.2 Filtering with Comparison Operators

To find expenses with an amount greater than \$50:

```
SELECT * FROM Expenses  
WHERE amount > 50;
```

2.3 Combining Filters (AND)

To find expenses greater than \$75 and belonging to the "Food" category (assuming "Food" is a valid category):

```
SELECT * FROM Expenses  
WHERE amount > 75 AND category = 'Food';
```

2.4 Combining Filters (OR)

To find expenses belonging to either the "Transportation" or "Groceries" categories:

```
SELECT * FROM Expenses  
WHERE category = 'Transportation' OR category = 'Groceries';
```

2.5 Filtering with NOT

To display expenses unrelated to the "Rent" category:

```
SELECT * FROM Expenses  
WHERE category <> 'Rent';
```

Part 3: Sorting Retrieved Data

3.1 Sorting by Amount

To display all expenses sorted by amount in descending order:

```
SELECT * FROM Expenses  
ORDER BY amount DESC;
```

3.2 Sorting by Date and Category

To sort expenses first by date in descending order and then by category in ascending order:

```
SELECT * FROM Expenses  
ORDER BY date DESC, category ASC;
```

Part 4: Database Upgrade

4.1 Creating the "Income" Table

To create a table named "Income" with the specified columns:

```
CREATE TABLE Income (  
    income_id INT PRIMARY KEY AUTO_INCREMENT,  
    amount DECIMAL(10,2) NOT NULL,  
    date DATE NOT NULL,  
    source VARCHAR(50) NOT NULL  
);
```

4.2 Adding a New Column "category"

To add a new column named "category" to the "Income" table:

```
ALTER TABLE Income  
ADD COLUMN category VARCHAR(50);
```

4.3 Removing the "source" Column

To remove the "source" column from the "Income" table:

```
ALTER TABLE Income  
DROP COLUMN source;
```