

## Part 1: Retrieving Data with SELECT (30 minutes)

### 1.1 Retrieving All Expenses

To retrieve all data points from the "Expenses" table, you can use the following SQL query:

```
SELECT * FROM Expenses;
```

### 1.2 Specific Columns

To select only specific columns, such as "date," "category," and "amount," use:

```
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 * FROM Expenses  
WHERE date BETWEEN '2021-01-01' AND '2024-12-15';
```

## Part 2: Filtering with WHERE Clause (45 minutes)

### 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:

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

## 2.4 Combining Filters (OR)

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

```
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 (45 minutes)

## 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 (descending order) and then by category (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

To add a new column named "category" of type VARCHAR(50):

```
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;
```

## Dropping the "Income" Table

To permanently remove the "Income" table from the database:

```
DROP TABLE IF EXISTS Income;
```

These queries should help you manage and analyze your expenses effectively, and the steps for database upgrades will assist in modifying and maintaining your database as needed.