What is Stored Procedure?

A **Stored Procedure** in SQL is a precompiled set of SQL queries that can be stored and executed on the database server. Stored procedures allow for encapsulating complex logic and processes into a single unit that can be executed by calling the procedure. They can also accept input parameters, return output parameters, and contain control-flow logic (like loops and conditionals).

```
CREATE PROCEDURE procedure_name (IN parameter_name datatype, OUT parameter_name datatype, ...)

BEGIN

    -- SQL statements

END;
```

Uses of Stored Procedures in Different Industries:

1. **Retail Industry:**
    - **Use Case:** Automating processes like calculating discounts during sales events or updating product inventories after each purchase.
    - **Example:** A stored procedure could be created to apply bulk discounts across multiple product categories for special promotions.
2. **Healthcare Industry:**
    - **Use Case:** Automating the billing process for patients, such as calculating total charges based on treatments and services received.
    - **Example:** A stored procedure could be used to generate patient bills by aggregating treatment costs, medications, and lab fees, and automatically applying insurance claims.
3. **Finance Industry:**
    - **Use Case:** Automating interest calculations for savings accounts or processing monthly loan payments.
    - **Example:** A stored procedure can calculate the monthly interest on a customer's savings account and automatically credit the calculated amount to the account at the end of each month.
4. **Telecommunications Industry:**
    - **Use Case:** Automating customer billing and call record analysis at the end of each billing cycle.
    - **Example:** A stored procedure could calculate a customer's monthly bill based on call data, SMS usage, and data consumption, while applying any discounts or penalties.
5. **Manufacturing Industry:**
    - **Use Case:** Automating production tracking and materials inventory management.
    - **Example:** A stored procedure could monitor and update inventory levels in real-time as materials are consumed during production, ensuring that reorders are triggered when stock falls below a certain level.

6. **Education Industry:**
    - **Use Case:** Automating processes like grading or course enrollments.
    - **Example:** A stored procedure could automatically assign grades to students based on their exam scores and then update their transcripts in the database.

Difference Between Stored Procedures and Views:

Aspect	Stored Procedures	Views
Definition	Precompiled set of SQL statements that can execute logic and return results.	A virtual table generated by querying underlying tables.
Purpose	Perform a series of tasks like updates, inserts, and calculations.	Present data in a simplified format without changing it.
Data Modification	Can modify data (INSERT, UPDATE, DELETE).	Cannot modify data directly unless it's an updatable view.
Control Flow Logic	Supports control-flow statements like IF, WHILE, and loops.	Does not support control-flow logic, as it only retrieves data.
Parameters	Accepts input, output, and in-out parameters.	No parameters; just retrieves the result of the query.
Execution	Needs to be explicitly executed with a command (e.g., CALL).	Queried like a table (e.g., SELECT * FROM view_name).
Performance	Can be faster due to pre-compilation and can handle complex logic.	May be slower with complex queries; mainly for data presentation.
Security	Sensitive business logic can be hidden in stored procedures.	Offers a simplified view of data but not used for business logic.
Use Case	Automating recurring business processes, applying complex rules.	Simplifying data access by aggregating or filtering data.

Real-Life Use Cases of Stored Procedures:

1. **Retail Industry:**
    - **Stored Procedure Use:** Automating end-of-day sales reconciliation across multiple stores.
        - A stored procedure could aggregate sales data from different branches, calculate total daily revenue, and update the financial reports.
2. **Healthcare Industry:**
    - **Stored Procedure Use:** Automating patient discharge processes.
        - When a patient is discharged, a stored procedure could generate their final bill, update the medical records, and send notifications to the concerned departments.

3. **Finance Industry:**
    - **Stored Procedure Use:** Automating payroll calculations for employees.
        - A finance department might use stored procedures to calculate payroll, including deductions and bonuses, and then automatically transfer the data to the accounting system.
4. **Telecommunications Industry:**
    - **Stored Procedure Use:** Automating customer plan renewals and billing.
        - A stored procedure could renew prepaid customer plans, deduct the relevant charges, and send notifications to customers.

Differences in Use Cases: Stored Procedures vs. Views

- **Stored Procedures:**
    - Ideal for **automating business processes** that involve multiple steps like inserting, updating, and processing data.
    - Example: In the **finance** industry, stored procedures are often used to calculate monthly interest on accounts and generate detailed statements.
- **Views:**
    - Useful for **simplifying complex queries** or providing a user-friendly way to access data without exposing the raw database structure.
    - Example: In **telecommunications**, a view might aggregate data from multiple tables (e.g., call logs, billing information) and present it in a simplified form for customer service representatives to quickly access.

In summary, **Stored Procedures** are ideal for automating and encapsulating complex logic and processes, while **Views** are used for simplifying data access and presenting a virtual table. Stored Procedures are more dynamic and versatile, whereas Views focus primarily on making data easier to query.