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Week 10 Lab

Database PL/pgSql Functions

[S23] Databases Course

Recap

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1. SQL functions are predefined routines that accept input parameters and return output values
2. They simplify complex queries
3. They reduce redundant code
4. They make SQL code more modular and reusable

Recap

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1. SQL functions perform specific operations on input values and return the result as output
2. Mathematical calculations, string manipulation, date and time operations, and many other operations can be performed using SQL functions
3. SQL functions are versatile and can handle many different types of data and operations
4. SQL functions can be used to simplify and streamline database operations

Recap

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1. Database management systems come with many built-in SQL functions
2. Users can create their own custom functions using SQL programming languages
3. Examples of SQL programming languages include PL/SQL in Oracle and PL/pgSQL in PostgreSQL
4. Custom functions can be tailored to specific database needs and operations

Example

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```
CREATE OR REPLACE FUNCTION get_customer_name(id INTEGER)
RETURNS VARCHAR(255) AS $$
DECLARE
  customer_name VARCHAR(255);
BEGIN
  SELECT name INTO customer_name FROM customers WHERE id = $1;
  RETURN customer_name;
END;
$$ LANGUAGE plpgsql;
```

Function in PL/pgSQL in PostgreSQL: Retrive customer based on ID

Exercise 1

In the DVD rental database, there is a table called "**address**" contains a column called "**address**" with text values. The goal is to convert these addresses into **longitude** and **latitude** coordinates and **create two new columns** in the "address" table.

To achieve this, the following steps need to be taken:

1. Create a function that retrieves all addresses containing the number "11" and with a city_id between 400 and 600.
2. Call this function from a Python script and use geoPy to generate longitude and latitude coordinates.
3. Create a SQL query to update the "address" table with the new longitude and latitude values.
4. For any addresses that geoPy is unable to recognize, set the longitude and latitude values to 0,0.

Once this is done, the updated "address" table should contain two new columns with longitude and latitude coordinates for each address.

Deliverables: Python code, output query for the "address" table, and SQL query with screenshots of the database function. For more information, please refer to the README.md file.

Exercise 2

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There are **fewer** than 600 customers in the "**Customer**" table, and there is no backend developer available to implement paging.

Your task is to create a function that retrieves customers ordered by their "address_id", with two parameters, "start" and "end".

For example, calling the function with "retrievecustomers(10,40)" will retrieve customers starting from the 10th customer in the query and ending with the 40th.

If either the "start" or "end" parameter is a negative number or greater than 600, an error message should be displayed to describe the error.

Deliverable: An SQL query to create the function, along with an example.

Useful resources

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1. Practical PostgreSQL database
2. PL/pgSQL Loop Statements
3. PostgreSQL For Loop: An Easy Guide
4. PL/pgSQL FOR Loop
5. PostgreSQL IF Statement

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Thank you for attention

See you next week