Business Intelligence

Practical Tutorial

Product Documentation

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Practical Tutorial
Collection of Optimization Practices
Speeding up Dropdown Filter Loading

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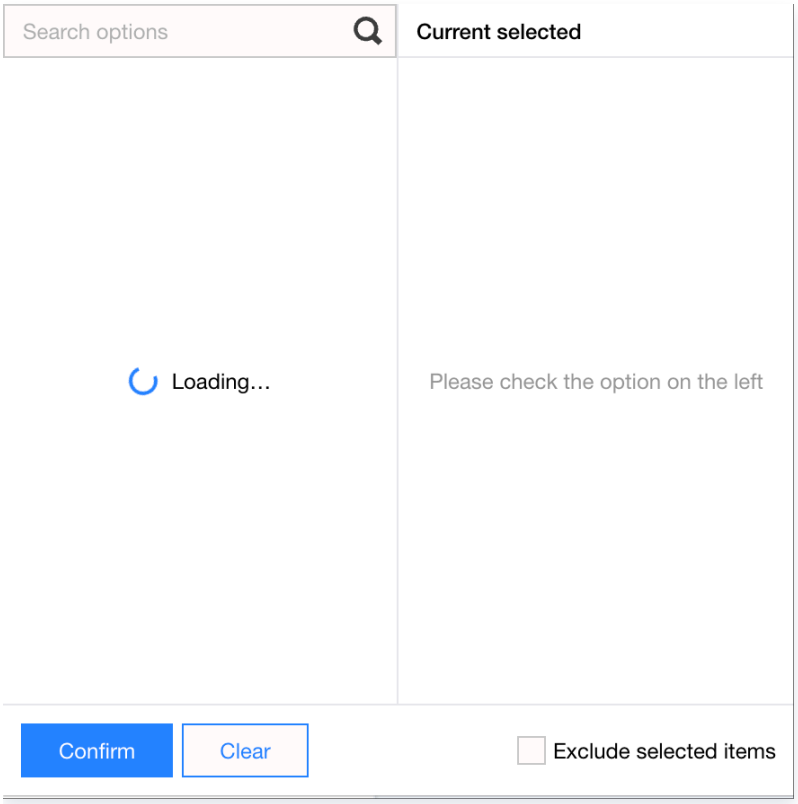
When the dropdown filter list is sourced from a data table, the results need to be queried and aggregated from the table before being loaded into the filter. This process can lead to delays in loading or even cause failures, as shown in the figure below.



The following conditions may cause slow filter loading.

- Excessive query data: For example, if the base table contains 1 million order records and you need to filter by province, the system will first need to query all 1 million records and then aggregate the records to extract information for over 30 provinces.
- Excessive result data: For example, if the base table contains 1 million order records and you need to filter by salesperson, each database query might return 50,000 salesperson records, resulting in a long data transfer time to the BI service.

Therefore, the optimization approaches are based on the following aspects:

- Reduce service queries: Avoid requesting the list unless necessary, suitable for fields with relatively fixed values, for example, selecting fields including month, province, and city.
- Reduce database queries: Avoid querying the database unless necessary, suitable for fields with low real-time requirements. For example, selecting a department list does not require a fresh query each time.
- Reduce data volume queries: Avoid querying detailed data unless necessary, suitable for fields with a large number of values but low real-time requirements. For example, selecting a vendor list does not require querying millions of data each time.

Select one or more approaches listed above to optimize performance according to the actual requirements.

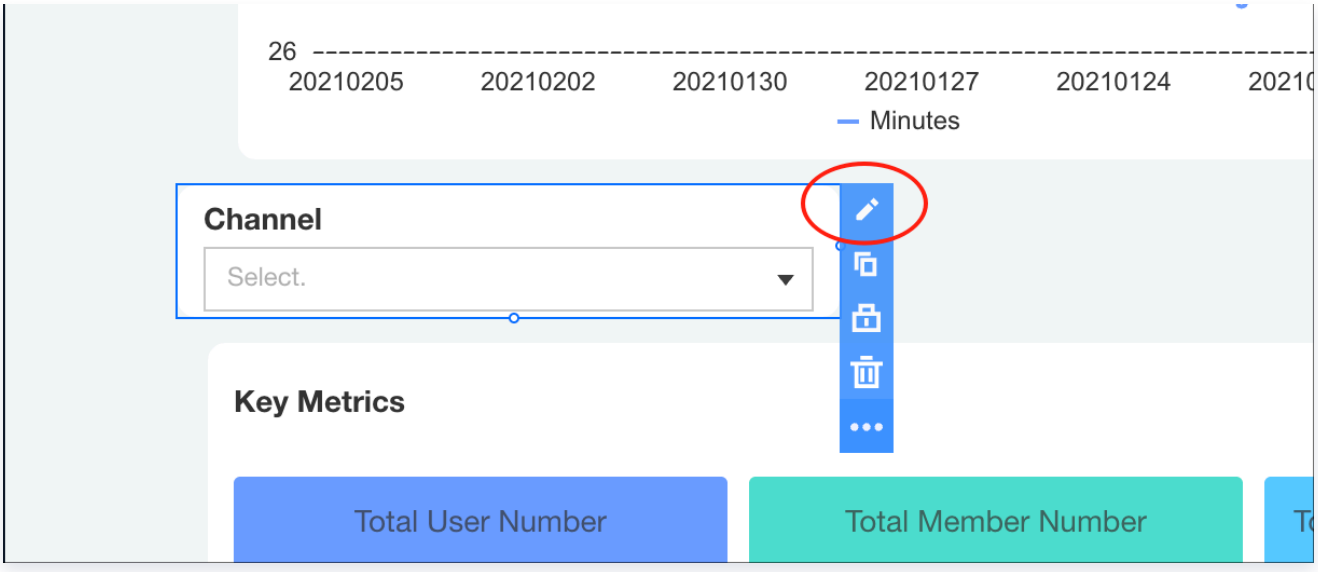
Reducing Service Queries: Manually Entering Static Values

Applicable scenarios: The list contains a relatively small number of fixed values, for example, province selection.
Advantages and disadvantages:

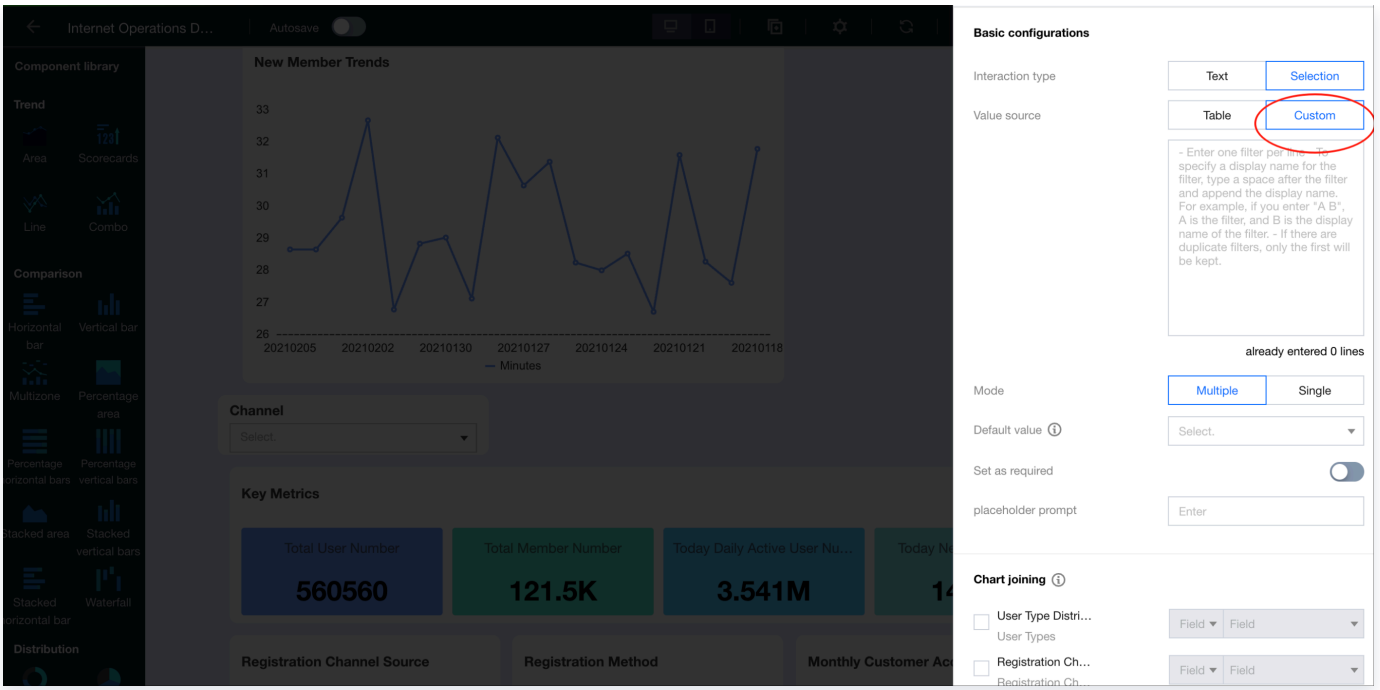
- Advantages: No need for queries. Data is loaded immediately when the chart loading is complete.
- Disadvantages: Not dynamic. For example, new values require manual maintenance.

Operation Guide:

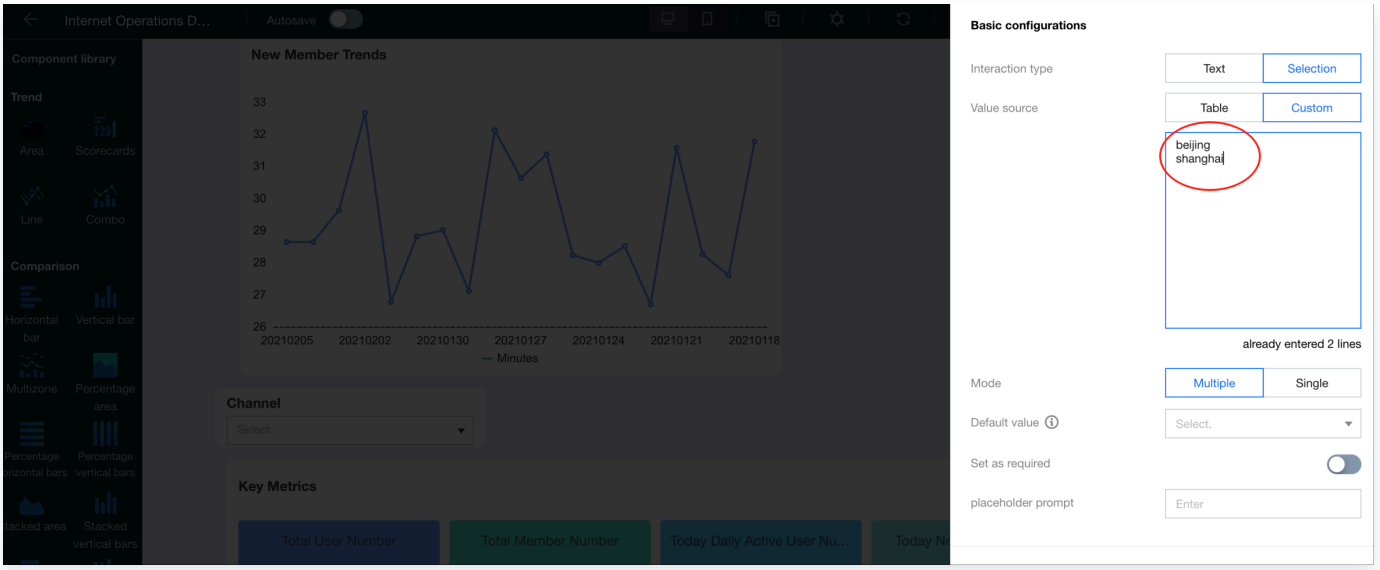
1. Go to the filter editor.



2. Set the data source to "Custom".



3. Set the dropdown option values.



4. Save to apply.

Reducing Database Queries: Using Filter Cache

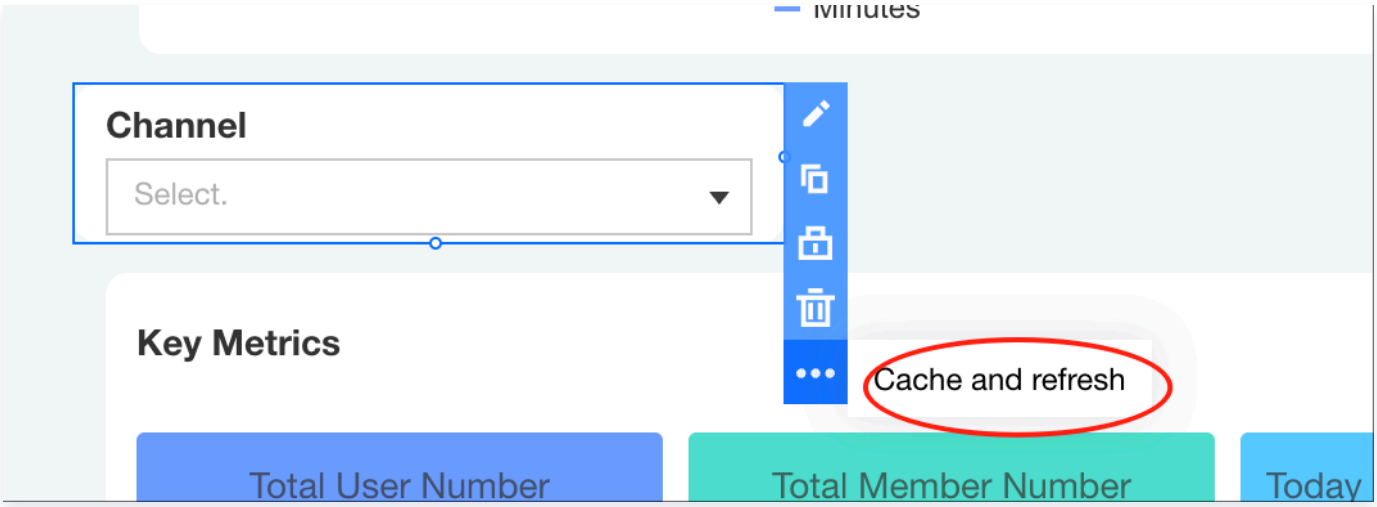
Applicable scenarios: The list values do not require real-time data and can be updated periodically, for example, vendor selection.

Advantages and disadvantages:

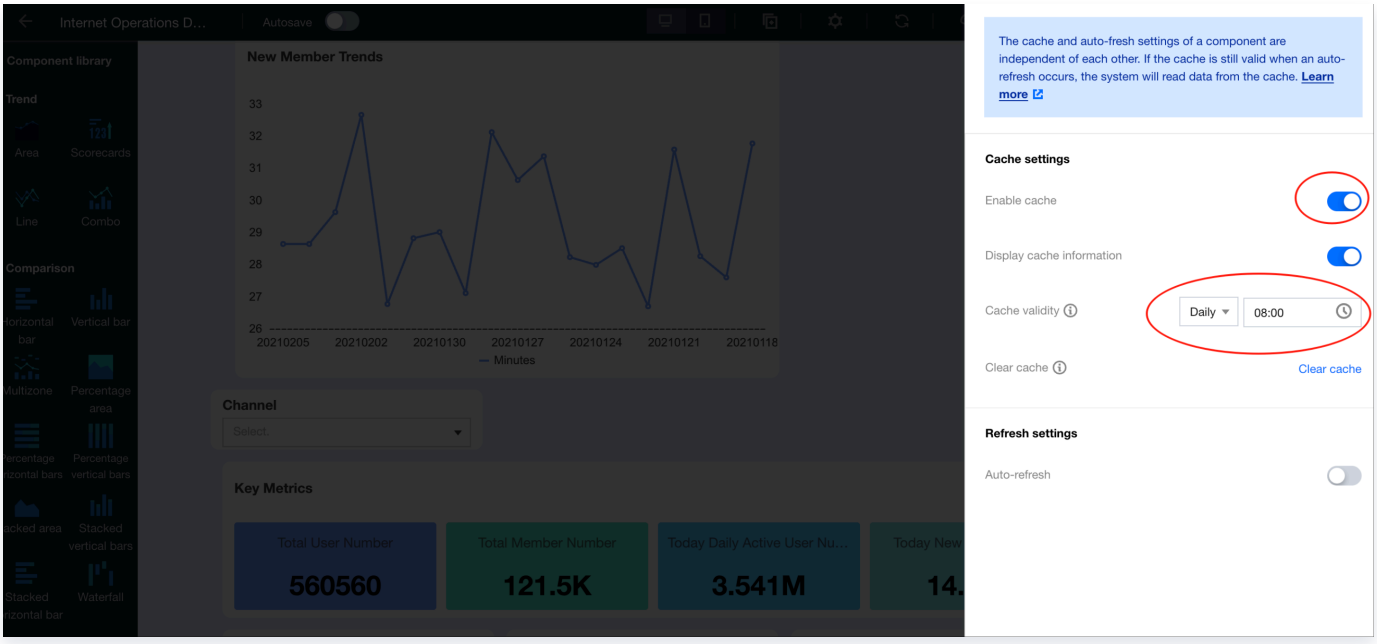
- Advantages: Faster than querying directly for the same query conditions.
- Disadvantages: Initial loading may still be slow. Changes in query conditions may require cache rebuilding, which can also be slow.

Operation Guide:

1. Go to the filter editor, and select "Cache and Refresh" in the menubar.



2. Enable caching and set the cache refresh frequency to daily at 08:00 (no need to trigger queries before 8 AM the next day).



3. Save to apply.

Reducing Data Volume Queries: Maintaining Dimension Tables Regularly

Applicable scenarios: List values do not require real-time data and can be updated periodically, for example, product selection.

Advantages and disadvantages:

- Advantages: Reduce the database load and decrease the query time for detailed data.

- Disadvantages: Require data engineers to operate.

Operation Guide:

1. Create an entity table in the database. The following example code generates a MySQL table:

```
-- Create a product dimension table.
CREATE TABLE dim_list (
    id INT AUTO_INCREMENT PRIMARY KEY,
    product_name VARCHAR(255) NOT NULL COMMENT 'Product Name',
    create_time TIMESTAMP DEFAULT CURRENT_TIMESTAMP COMMENT 'Creation
Time',
    update_time TIMESTAMP DEFAULT CURRENT_TIMESTAMP ON UPDATE
CURRENT_TIMESTAMP COMMENT 'Update Time',
    UNIQUE KEY (product_name) -- Ensure product name uniqueness.
) ENGINE=InnoDB DEFAULT CHARSET=utf8mb4 COMMENT='Product Dimension
Table';

-- Initialize the data.
INSERT INTO dim_list (product_name)
SELECT DISTINCT Product Name
FROM order_tab
WHERE Product Name IS NOT NULL
ON DUPLICATE KEY UPDATE product_name = VALUES(product_name);
```

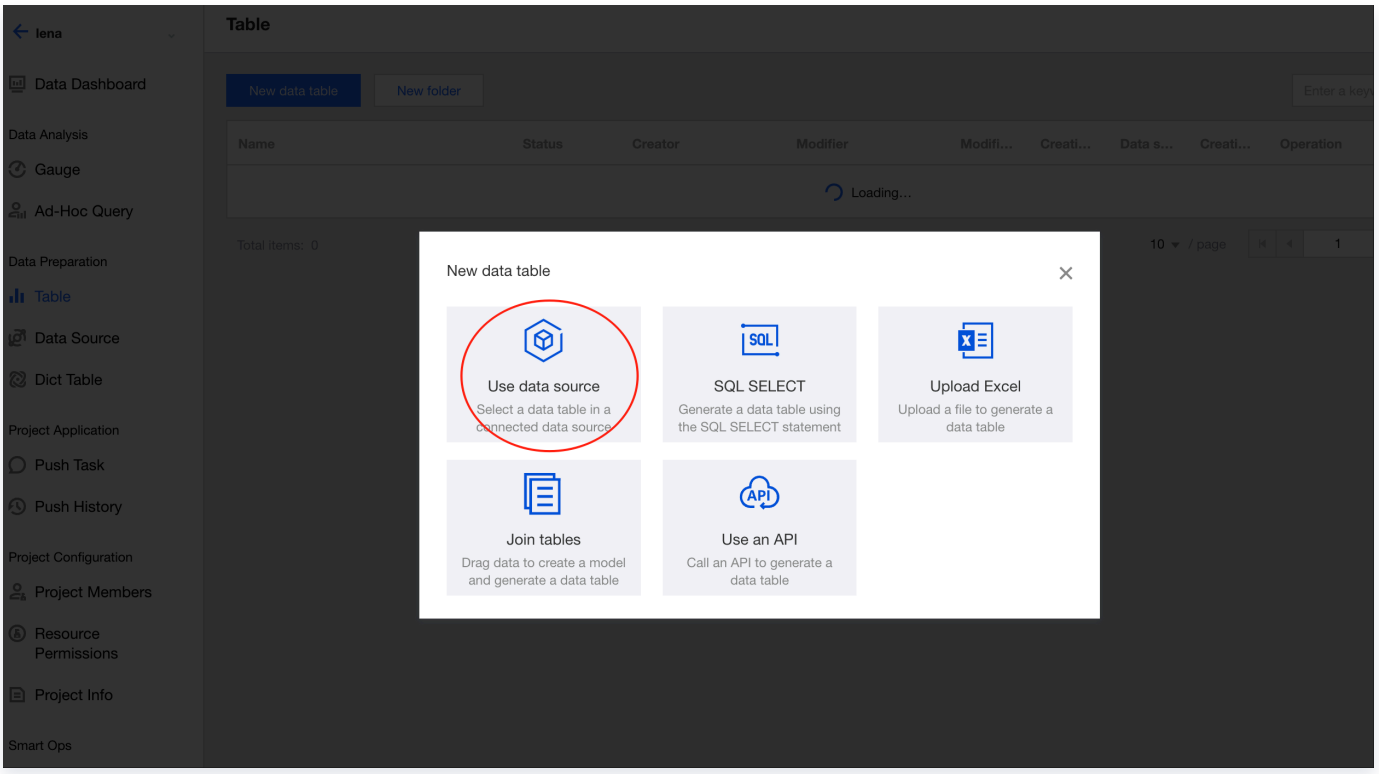
* The above code retrieves the "Product Name" field from the order details table order_tab and generates a dimension table dim_list based on the product names.

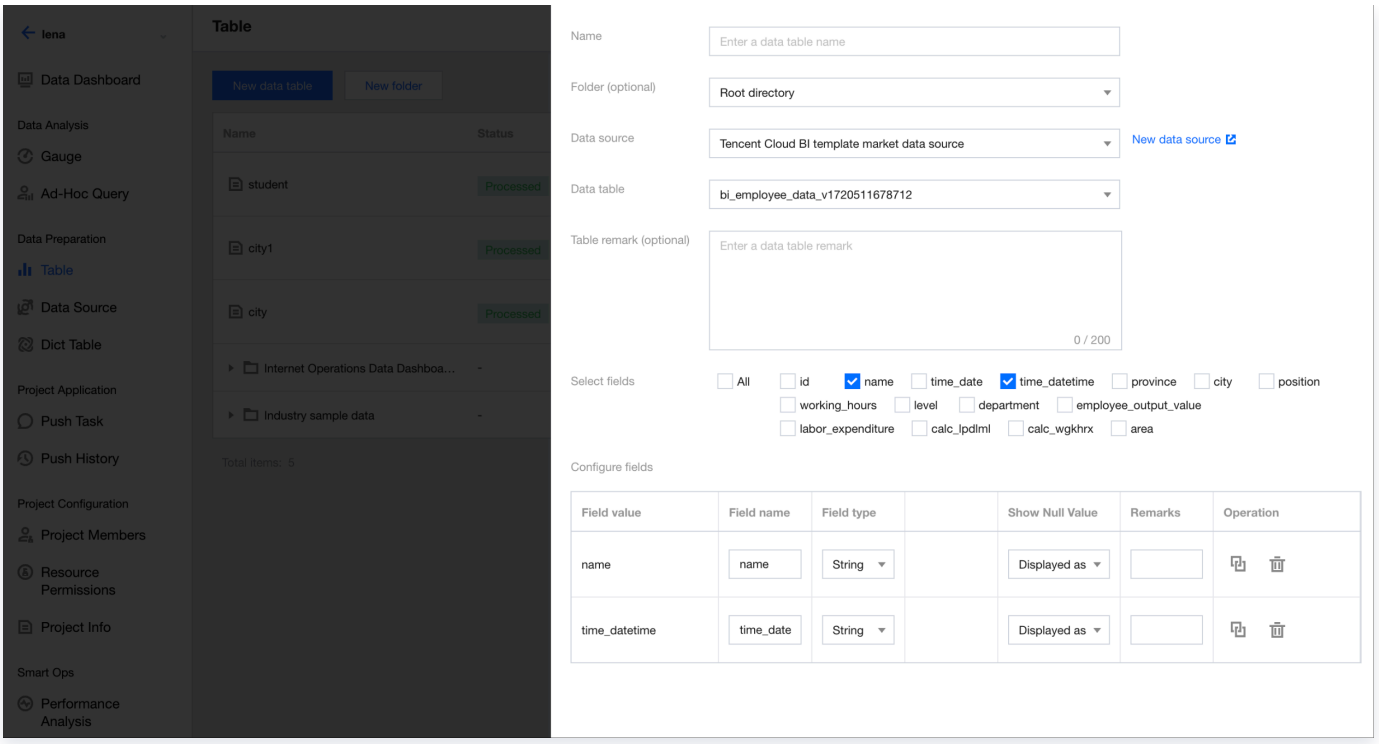
2. Create a scheduled task to update the data regularly:

```
-- Create a stored procedure.
DELIMITER //
CREATE PROCEDURE update_dim_list()
BEGIN
    INSERT INTO dim_list (product_name)
    SELECT DISTINCT Product Name
    FROM order_tab
    WHERE Product Name IS NOT NULL
    AND Product Name NOT IN (SELECT product_name FROM dim_list)
    ON DUPLICATE KEY UPDATE product_name = VALUES(product_name);
```

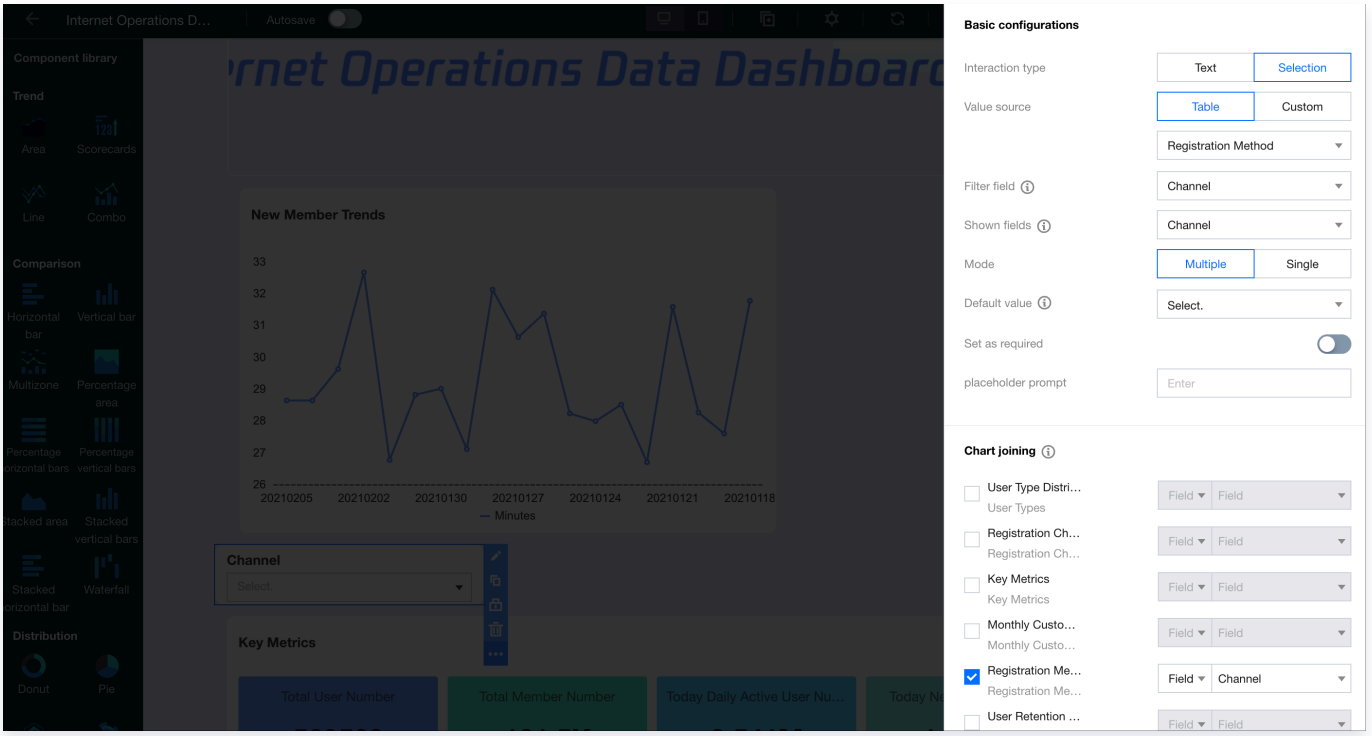
```
END //
DELIMITER ;

-- Set a scheduled task (execute at 8:00 daily).
CREATE EVENT IF NOT EXISTS daily_dim_list_update
ON SCHEDULE EVERY 1 DAY STARTS '2025-05-17 08:00:00'
DO CALL update_dim_list();
```

3. In BI, create a data source and data table that are connected to the previously created dim_list table (illustrated below using a data table as an example).





4. Associate the filter with the product name field in the data table.



Performing Trend Analysis

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Trend analysis usually adopts line charts (or area charts). Line charts can display continuous data over time, suitable for showing trends at equal time intervals. In line charts, category data is evenly distributed along the horizontal axis, and all value data is evenly distributed along the vertical axis. The following example uses population trends across different cities over time to introduce how to create a trend analysis chart.

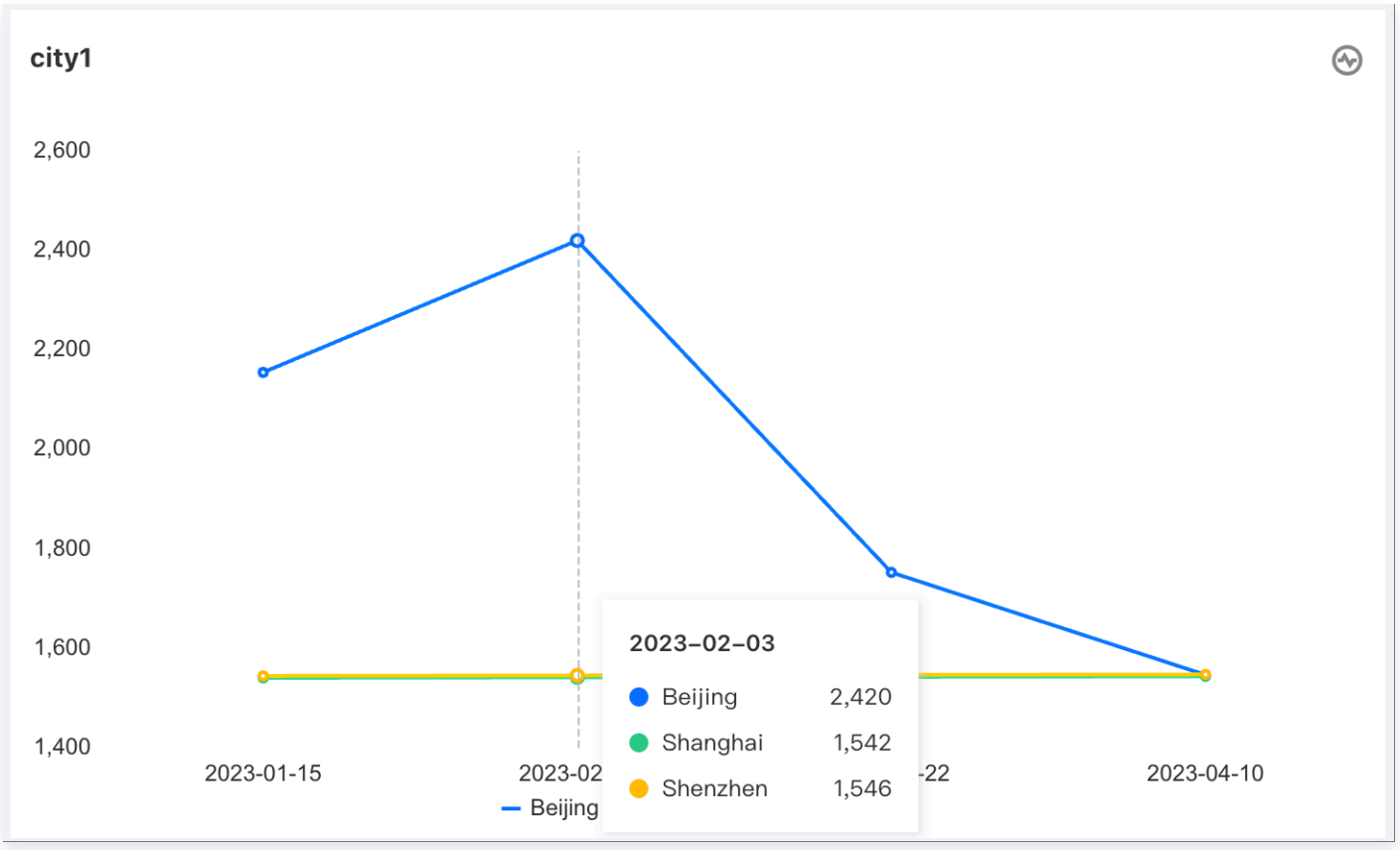
Adding Components

Drag and drop the 

chart component from the component pane on the left to the canvas.

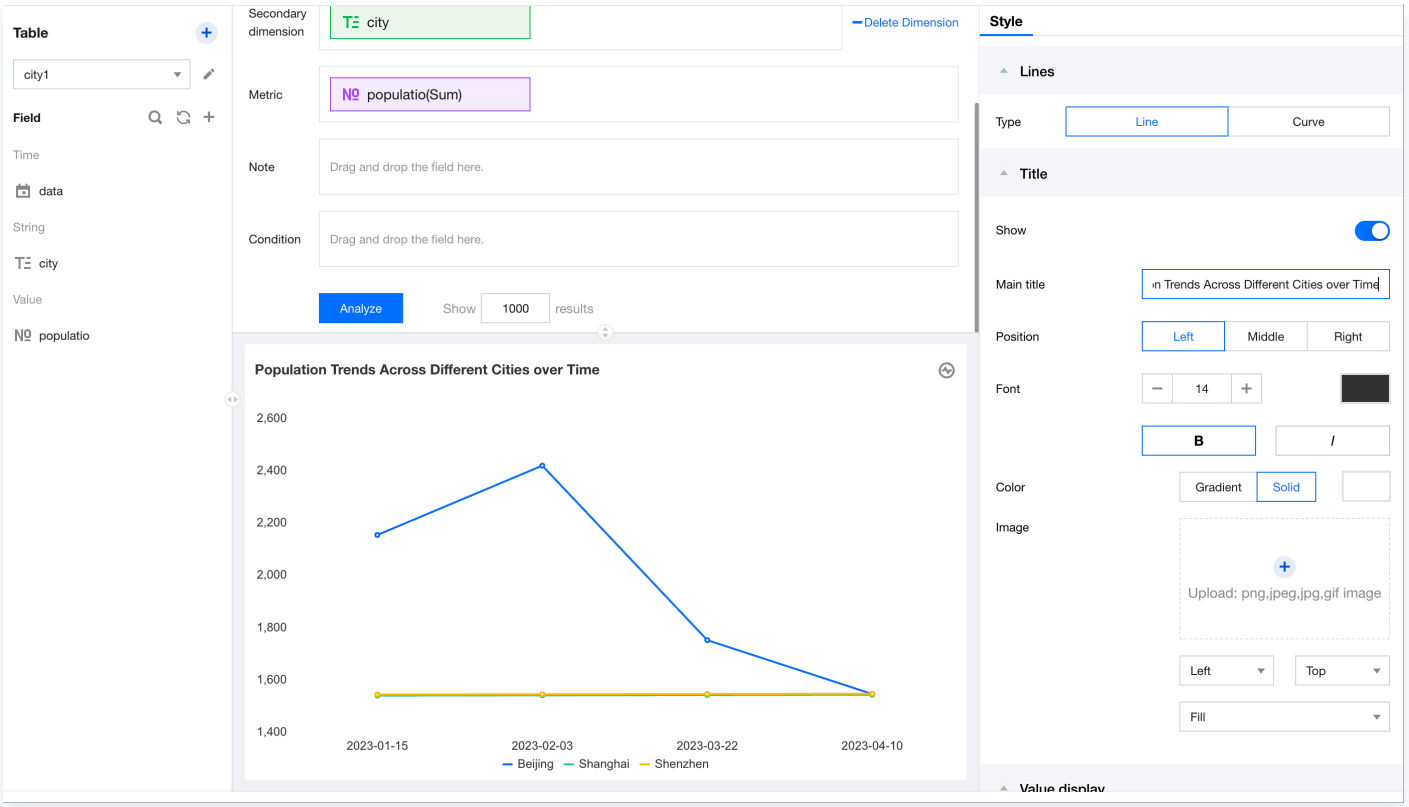
Configuring Query Conditions

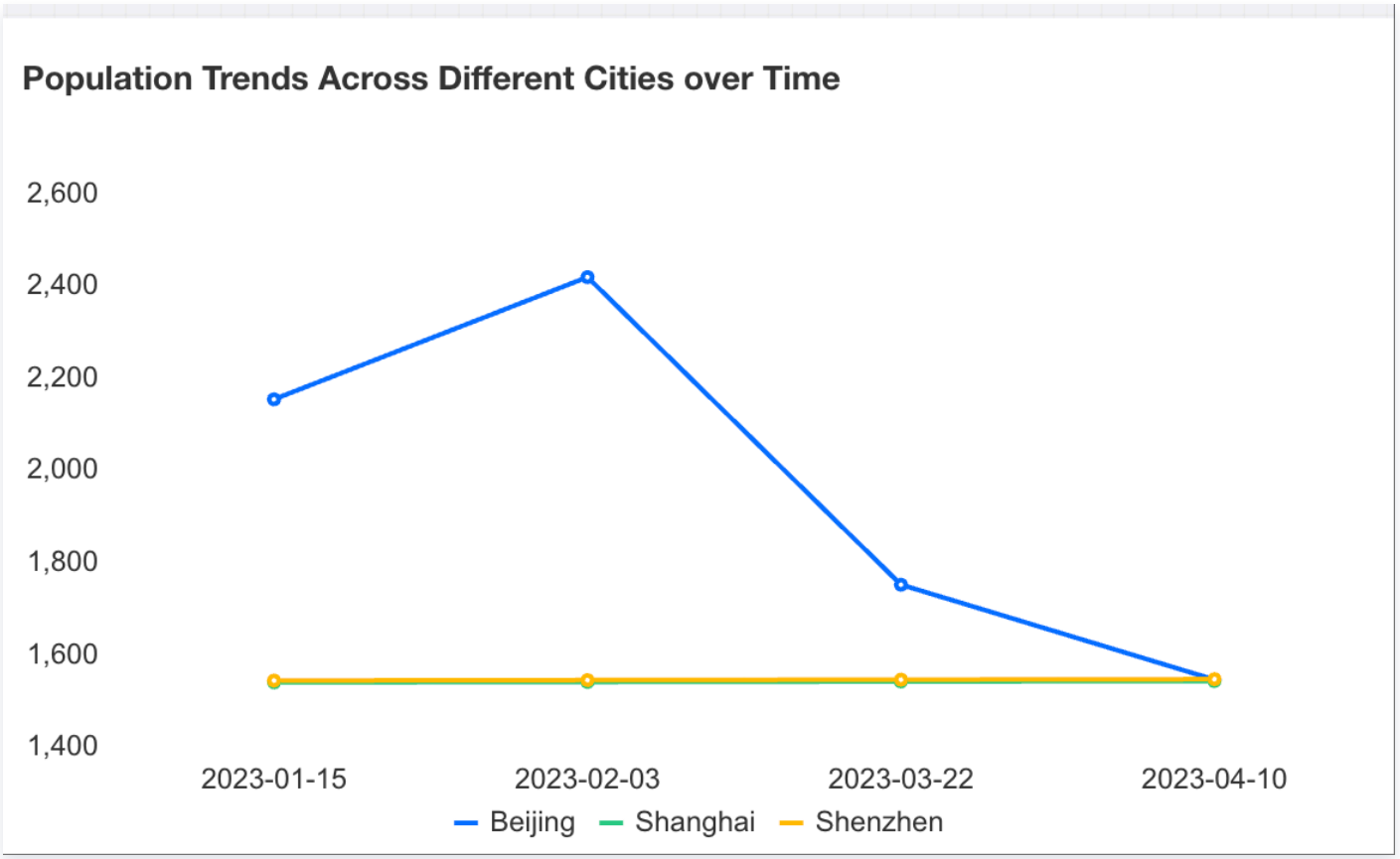
After selecting the data table on the left, drag the "date" and "city" dimensions to the dimension axis, and drag "population" to the metric axis. Click **Analyze** to generate a trend chart.



Setting Chart Titles

In the title area on the right, enter the title text "Population Trends Across Different Cities over Time" and update the title.





Performing Proportion Analysis

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Proportion analysis usually adopts pie charts (or donut charts). A pie chart displays the relative size of each part within a data series as a proportion of the whole. Each slice in a pie chart represents the proportion of a specific item. The following example introduces how to create a proportion analysis chart using students' score proportions.

Adding Components

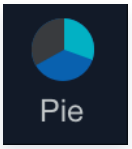
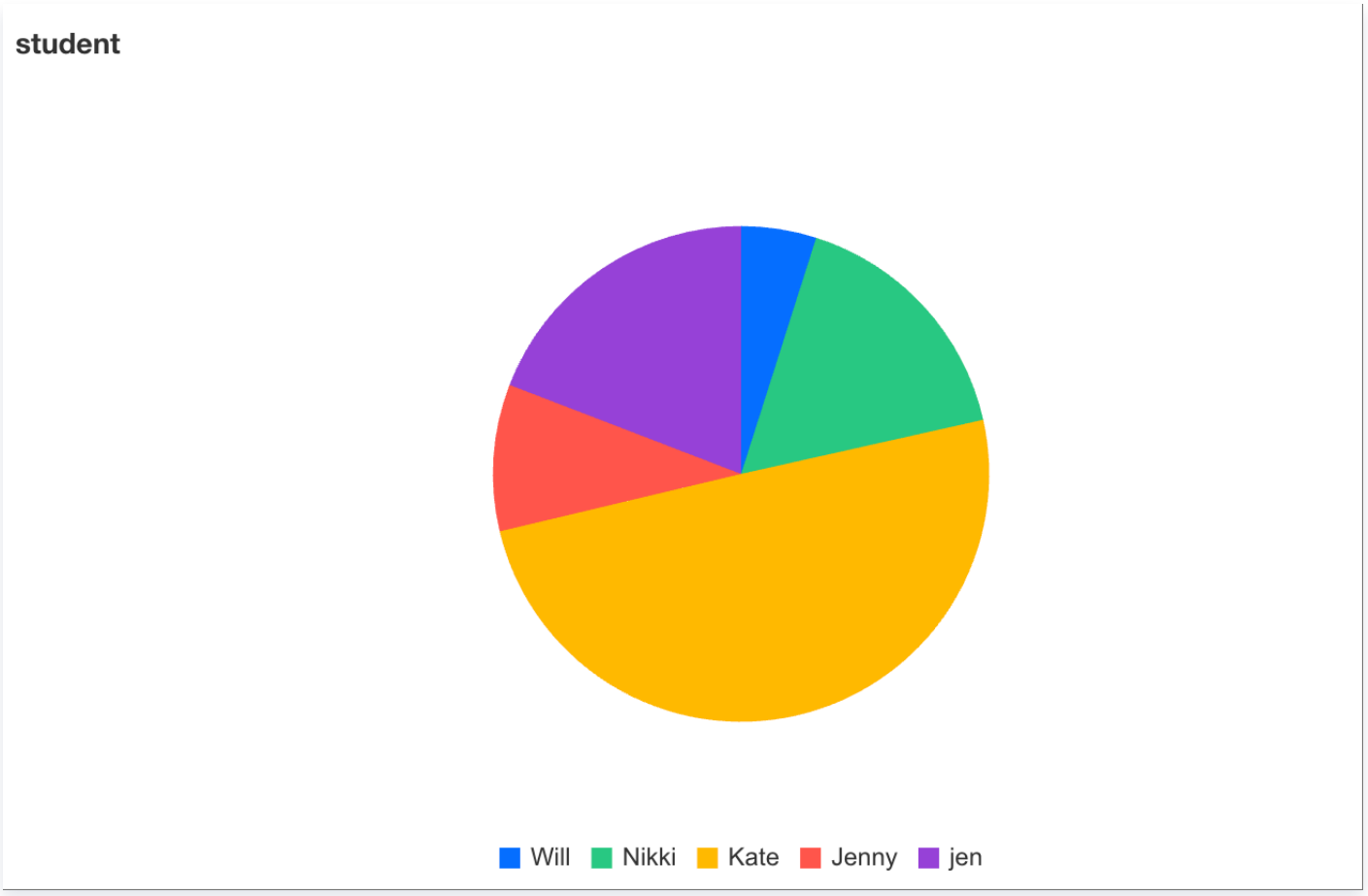
Drag and drop the 

chart component from the component pane on the left to the canvas.

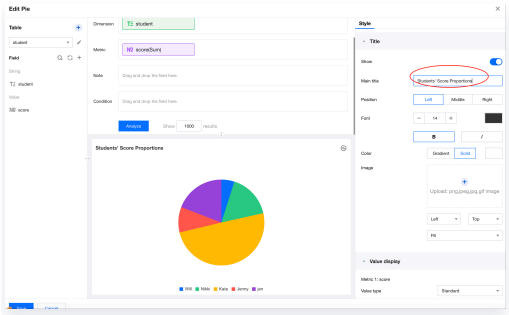
Configuring Query Conditions

Drag "student" from the data list on the left to the dimension area and "score" to the metric area, and click Analyze to generate a pie chart.

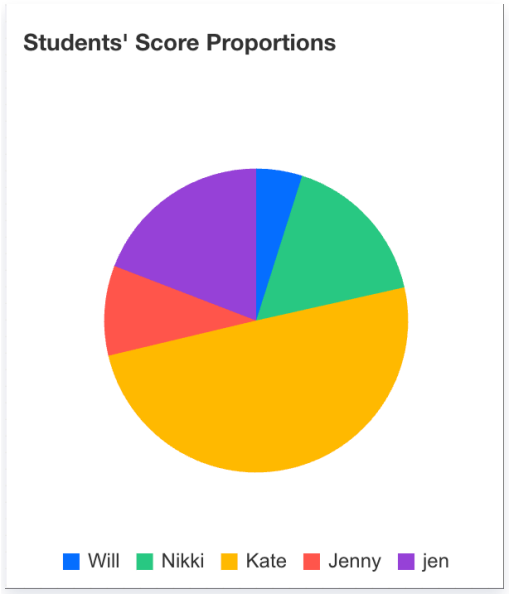


Setting Chart Titles

In the title area on the right, enter the title text "Students' Score Proportions" and update the title.



The final pie chart is shown below:



Performing Data Analysis with Excel Files

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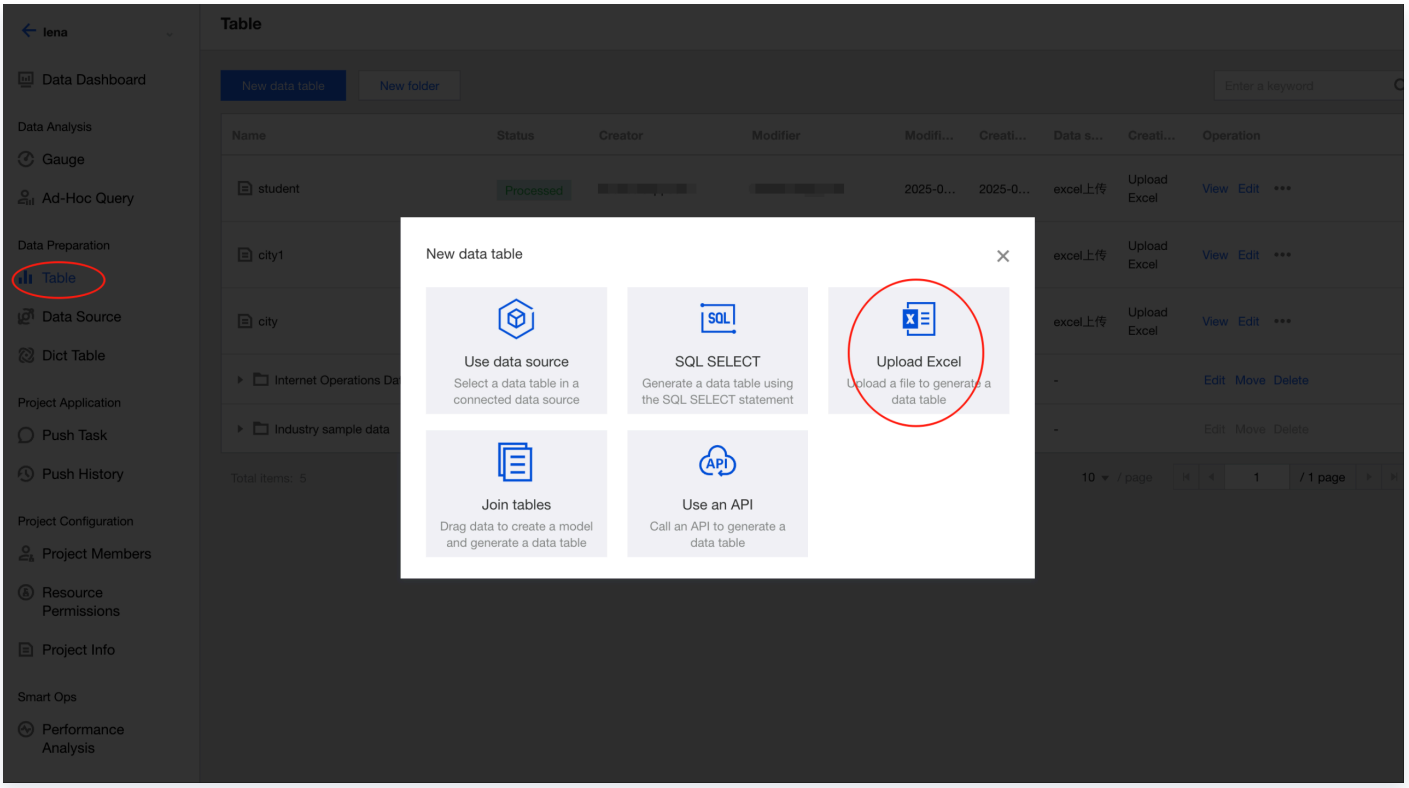
If your data is stored in an Excel file, you can upload the Excel data source in the following ways for further analysis.

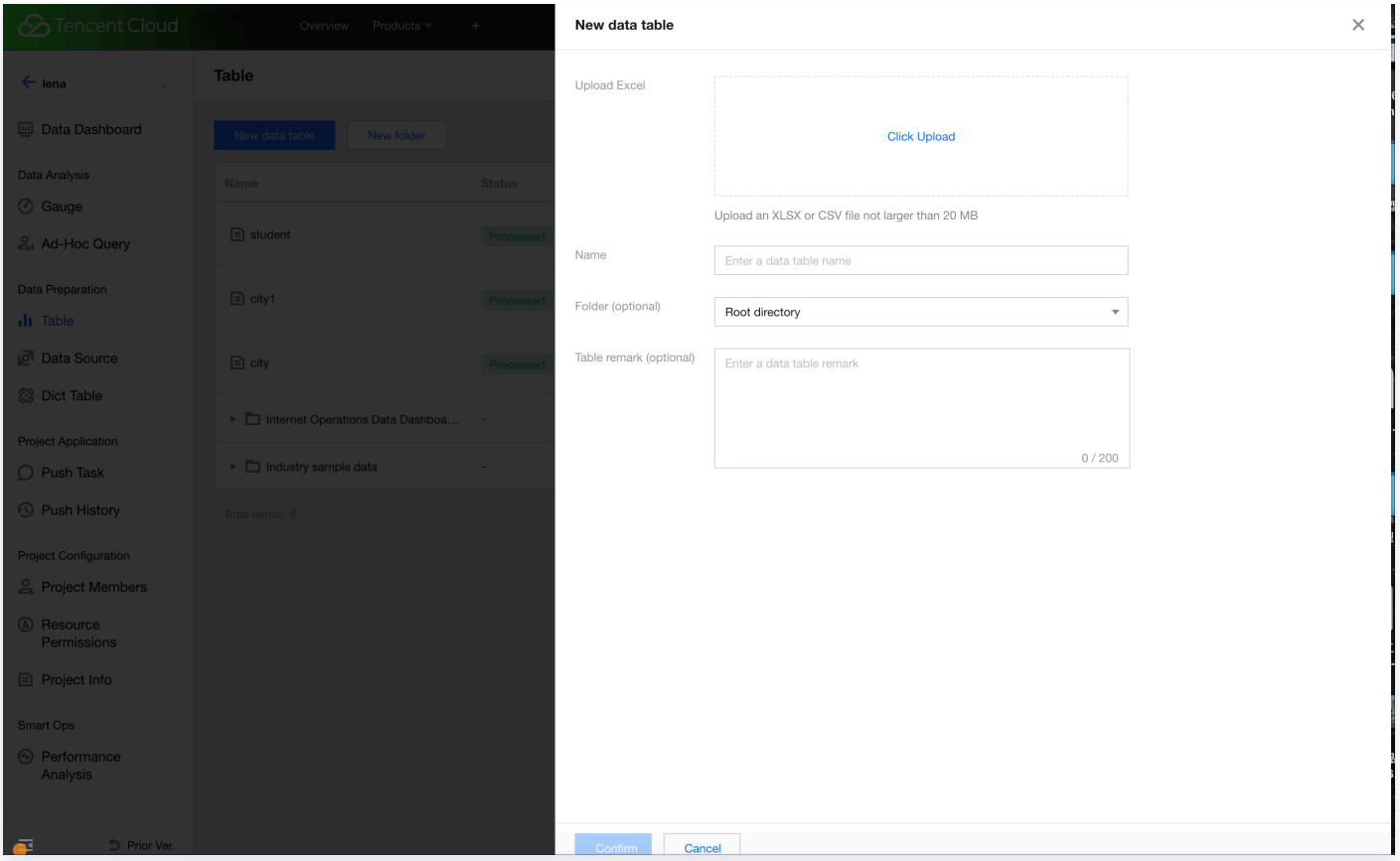
Selecting Excel for Table Creation

Go to the project, then select **Data** > **Data Table** > **Create Data Table** > **Excel Table Creation**.



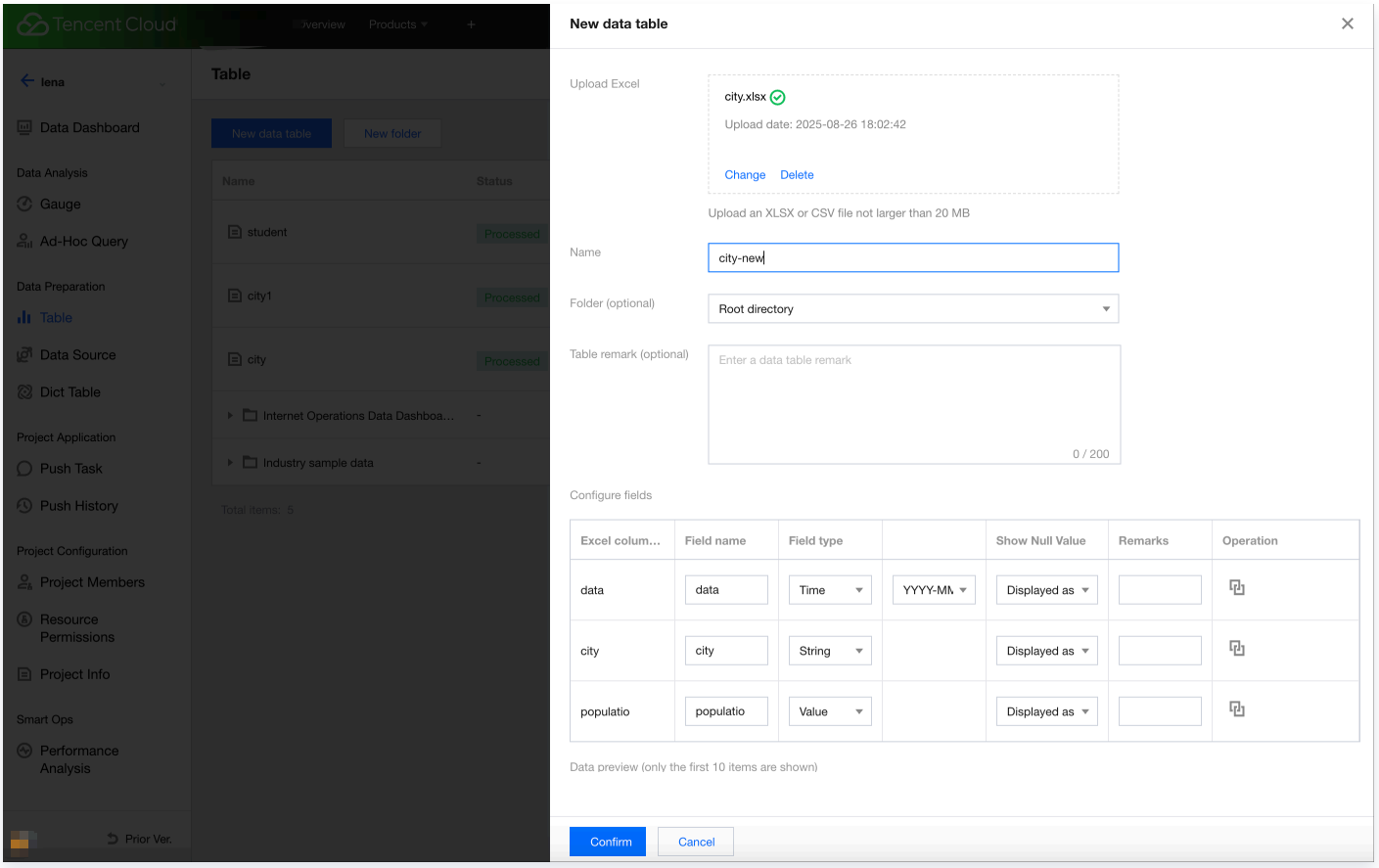
Uploading Files

Select the Excel file to upload, and enter the display name, associated folder, and other basic information.



Once the upload is completed, the fields in the file will be parsed. Configure the display name, format, and other related properties of each field based on actual requirements, and preview the uploaded content (first

10 entries).



Uploading Completed

Click **Confirm** to complete the creation. A new data table will appear in the data table list page.

Creating Tables

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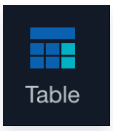
Tables serve as carriers for displaying data and can present multiple fields from any data table. Tables can display both detailed data and statistical data. Next, we will introduce how to use the table components.

Adding Components

Drag and drop the 

components from the component pane on the left to the canvas area.

Configuring Query Conditions

After selecting the data table, drag and drop fields to the dimension and metric areas to generate the following table.