Call Center ABC

Calls, Sales and Average Handle Time

# Description

Dataset shared represents performance data for Call Center ABC, where information such as, number of calls, sales units and call time is present. Table dbo.RawPerformanceData contains the following columns/information:

* **UserId:** user whose performance belongs to
* **Category:** call category. There are many call categories, a single user can have performance information in multiple categories
* **EventDate:** date when performance took place
* **NumberOfCallsType1:** number of calls of type 1
* **NumberOfCallsType2:** number of calls of type 2
* **SalesType1:** number of sales units sold of type 1 (there’s no connection between sale type and call type)
* **SalesType2:** number of sales units sold of type 2
* **SalesType3:** number of sales units sold of type 3
* **SalesType4:** number of sales units sold of type 4
* **SalesType5:** number of sales units sold of type 5
* **SalesType6:** number of sales units sold of type 6
* **CallTimeType1:** there are many components of call time. This one represents call time type 1
* **CallTimeType2:** call time type 2
* **CallTimeType3:** call time type 3
* **CallTimeType4:** call time type 4
* **CallTimeType5:** call time type 5
* **CallTimeType6:** call time type 6
* **CallTimeType7:** call time type 7
* **CallTimeType8:** call time type 8
* **CallTimeType9:** call time type 9

Information above can be used to calculate KPIs/metrics such as Total Number of Calls Handled, Total Sales or Average Handle Time at different levels (user, category, overall), using formulas below:

* **Total Number of Calls Handled:** NumberCallsType1 + NumberCallsType2
* **Total Sales Units:** SalesType1 + SalesType2 + SalesType3 + SalesType4 + SalesType5 + SalesType6
* **Total Time in Call:** CallTimeType1 + CallTimeType2 + CallTimeType3 + CallTimeType4 + CallTimeType5 + CallTimeType6 + CallTimeType7 + CallTimeType8 + CallTimeType9
* **Average Handle Time (AHT):** Total Time in Call / Total Number of Calls Handled
* **Sales per Call:** Total Sales Units /Total Number of Calls Handled

# Data Considerations

* Number of calls column can be NULL, 0 or greater than 0. NULL values can be interpreted as 0 number of calls in the row
* Sales columns can be NULL, zero, negative or positive. NULL values can be interpreted as 0 sales, while negative sales can be interpreted as returns from previous sales
* All sales are present on Category -1
* Call time columns can be NULL, zero or positive. NULL can be interpreted as no data present (no calls taken) and should match to Number of calls = 0 or Number of calls = NULL
* All call time are present on Category <> -1

# Task

Using shared performance data, run an octiling analysis by Average Handle Time (AHT), by category. It should contain the following:

* Columns (in this order):
  + Octile number
  + Population: count distinct of users
  + Calls Handled: sum of calls handled
  + Average AHT
  + Sales per Call
  + Total Sales Units: sum of sales units
  + Max AHT
  + Min AHT
* Information:
  + Summary section
    - Summary line
    - Summary octiles
    - **Clarification:** due to the fact that sales information is present only on category = -1 and call time information is only present on category <> -1, summary section will be calculated grouping by user id, considering all categories the user was present on.
  + Octile per category
    - Should include category summary
  + It should be possible to see which users are present on each category, with their corresponding performance columns data.
  + On each category (category -1 is the exception) it will be only possible to show call data (AHT, calls handled) as sales data is only present on category = -1. On the other hand, on category -1 only sales data will be present.
* Conditions:
  + Only consider sales units > 0 (exclude negative sales and sales = 0 records)
    - This condition will be applied at user level. Users that do not meet this condition will be excluded from the analysis.
    - E.g. User 123 has call information in different categories, but the sum of all user’s sales is negative. The user will be excluded from the octiling analysis completely
  + Octile analysis per category should be sorted number of calls handled. I.e., if number of calls on category 1 is 100, number of calls on category 2 is 80 and number of calls on category 3 is 120, octiles should be present in order:
    - Category 3: 120
    - Category 1: 100
    - Category 2: 80

Analysis should look like as shown below:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Category** | **Octile #** | **Population** | **Calls Handled** | **AVG AHT** | **Sales x Call** | **Sales Units** | **Max AHT** | **Min AHT** |
| **Summary Line** | | **800** | **500** | **1000** | **0.5** | **250** | **2000** | **500** |
| **Summary Octiles** | 1 | 100 | 65 | 600 | 0.47 | 30 | 700 | 500 |
| 2 | 100 | 65 | 700 | 0.47 | 30 | 800 | 600 |
| 3 | 100 | 60 | 800 | 0.58 | 35 | 900 | 700 |
| 4 | 100 | 60 | 900 | 0.58 | 35 | 1000 | 800 |
| 5 | 100 | 65 | 1000 | 0.47 | 30 | 1100 | 900 |
| 6 | 100 | 60 | 1100 | 0.5 | 30 | 1200 | 1000 |
| 7 | 100 | 65 | 1200 | 0.47 | 30 | 1300 | 1100 |
| 8 | 100 | 60 | 1250 | 0.5 | 30 | 1400 | 1200 |
| **Category 1** | | **40** | **120** | **900** | **0** | **0** | **1000** | **800** |
| **Category 1** | 1 | 5 | 15 | 400 | 0 | 0 | 500 | 300 |
| 2 | 5 | 15 | 500 | 0 | 0 | 600 | 400 |
| 3 | 5 | 15 | 600 | 0 | 0 | 700 | 500 |
| 4 | 5 | 15 | 800 | 0 | 0 | 900 | 700 |
| 5 | 5 | 15 | 1000 | 0 | 0 | 1100 | 900 |
| 6 | 5 | 15 | 1100 | 0 | 0 | 1200 | 1000 |
| 7 | 5 | 15 | 1150 | 0 | 0 | 1250 | 1000 |
| 8 | 5 | 15 | 1200 | 0 | 0 | 1300 | 1100 |
| **Category 2** | | **80** | **80** | **900** | **0** | **0** | **1000** | **800** |
| **Category 2** | 1 | 10 | 10 | 400 | 0 | 0 | 500 | 300 |
| 2 | 10 | 10 | 500 | 0 | 0 | 600 | 400 |
| 3 | 10 | 10 | 600 | 0 | 0 | 700 | 500 |
| 4 | 10 | 10 | 800 | 0 | 0 | 900 | 700 |
| 5 | 10 | 10 | 1000 | 0 | 0 | 1100 | 900 |
| 6 | 10 | 10 | 1100 | 0 | 0 | 1200 | 1000 |
| 7 | 10 | 10 | 1150 | 0 | 0 | 1250 | 1000 |
| 8 | 10 | 10 | 1200 | 0 | 0 | 1300 | 1100 |
| **Category 3…** | |  |  |  |  |  |  |  |

# Instructions

* On a SQL database run script attached to create table [dbo].[RawPerformanceData] with its data
* Run analysis on the tool of preference: SQL, python, any other
* Create a report with information as described above on the tool of preference: excel, power BI, SSRS, any other
* Feel free to perform additional analysis/prepare additional reports you consider relevant
* On our next meeting you will:
  + Show and explain how calculations and report was built
  + Share and explain any insight found on the data
  + Share and explain any additional analysis performed, its relevance, and any future work you’d be interested in

# Data

