Case 2: Motor Insurance Part Mapping and Recommendation

Introduction and Background

In the heart of the bustling motor insurance industry, AutoSure Insurance had built a reputation for quick and efficient claim settlements. At the helm of the company was its visionary CEO, Mr. Aryan Mehta, who prided himself on maintaining customer trust and operational excellence. However, despite the company's efforts, a persistent problem was plaguing the claims department—inconsistencies in damage assessment and claim verification.

Whenever an accident occurred, AutoSure Insurance followed a well-defined process:

1. A surveyor was dispatched to assess the vehicle’s damages and input the details manually into the company's system.
2. The garage, where the vehicle was being repaired, also submitted its own list of damaged parts.
3. The insurance team compared these two lists before processing payments to ensure accuracy and prevent fraudulent claims.

Challenges in the Current Process

However, critical issues arose in this process:

* Inconsistent Part Names: Since surveyors entered damaged parts manually, there was no standardization. For instance, a surveyor might enter "Left Door", while the garage might list it as "Driver-Side Door", making it difficult to match the records correctly.

The Challenge

* To enhance the accuracy of damage assessment and streamline claim verification, AutoSure Insurance aims to implement the mapping of damaged parts between the garage and surveyor datasets. Given the vast number of claims and parts involved, ensuring precise alignment is a challenge.
* Elaborate on the techniques used and results obtained from matching. Provide a mapping summary report of the surveyor and garage invoices. Additionally, include examples of part comparisons between the two.

Additional Questions

* List the most commonly damaged parts, along with their count and percentage.
* You have been provided with a CSV file containing a list of primary parts. Using the surveyor data,
* Find the distribution of claims by primary parts.
* Identify the top 10 secondary parts associated with each primary part. Additionally, calculate and list their claim counts.
* Build a detailed dynamic approach to streamline the damage assessment process and improve claim verification, AutoSure Insurance aims to implement a Part Recommendation System within the Surveyor App UI. This system will enhance claim processing efficiency by:
  + Recommending associated damaged parts based on historical claim data.

When a surveyor selects a damaged part, the system will analyze historical claims and suggest the top 5 most commonly associated damaged parts. As the user selects more parts, the system will dynamically update recommendations, refining the list based on the parts already chosen. This iterative recommendation approach will assist surveyors in identifying potential hidden damages, reducing discrepancies, and minimizing fraudulent claims.

**Assumptions may be made as necessary to solve the problem and should be stated clearly.**

About Data

**Garage Data:**

Garage Data captures information on vehicle repairs and part replacements recorded at service centers. Key attributes include:

* REFERENCE\_NUM – A unique identifier or reference number for the record.
* PRODUCT\_INDEX – An index or code representing the product category.
* VEHICLE\_MODEL\_CODE – A code representing the specific vehicle model.
* CLAIMNO, CLAIM\_NO, NUM\_CLAIM\_NO – Claim identification details
* PARTNO – The unique part number associated with the claimed or repaired vehicle part.
* PARTDESCRIPTION – A textual description of the part (e.g., "Brake Pad", "Fuel Pump").
* TOTAL\_AMOUNT – The total cost associated with the claim, covering parts.

**Surveyor Data:**

Surveyor Data provides an assessment of the parts involved in insurance claims as recorded by surveyors. It includes details such as:

* REFERENCE\_NUM – A unique identifier or reference number for the record.
* PRODUCT\_INDEX – An index or code representing the product category.
* VEHICLE\_MODEL\_CODE – A code representing the specific vehicle model.
* CLAIMNO, NUM\_CLAIM\_NO, NUM\_CLAIM\_NO – Claim identification details
* TXT\_PARTS\_GROUP\_NAME – The general name of the group or category to which the part belongs.
* TXT\_PARTS\_NAME – The specific name of the part (e.g., Brake Pad, Radiator).
* TOTAL\_AMOUNT – The total cost or amount associated with the claim, covering parts.
* NUM\_PART\_CODE – A unique numeric code representing the specific primary part.

**Primary\_Part\_Code Data:**

* Product - The category of the vehicle for which the primary part belongs (e.g., "Private Car").
* Surveyor Part Code - A unique identifier assigned by the surveyor for each **primary** vehicle part.
* Surveyor Part Name - The name of the **primary** vehicle part.

Preview Folder Information:

* A Preview folder has been provided for your reference, containing approximately 1,000 data points. The reason for creating this folder is to prevent data corruption. Opening the original data directly in an Excel file may cause it to become corrupted.

The case should cover the following area with project code/ workflow, PDF document and short PPT for final presentation.

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| **Sr. No** | **Method** |
| 1 | Identification of Business Problem |
| 2 | Data Preparation and Availability |
| 3 | Proposed Approach |
| 4 | Data Analysis |
| 5 | Conclusion and Findings |