B2B Courier Charges Accuracy Analysis

Background Information

In today's fast-paced e-commerce industry, fast and efficient order delivery is crucial to business success. To ensure seamless order fulfilment, businesses often partner with courier companies to ship their products to customers. However, managing the charges collected by these courier companies can be difficult, especially when dealing with a high volume of orders. It is one of the real-time problems B2B businesses experience when their estimated charges for the same invoice don't match. In this project we will analyse a B2B Courier Charges Accuracy using Python.

B2B courier charges accuracy analysis focuses on assessing the accuracy of fees charged by courier companies for the delivery of goods in B2B transactions. The aim is to ensure that companies are billed appropriately for the services provided by courier companies.

Problem Statement

B2B Ecommerce Fraud: Case Study

ABC Company operates an e-commerce platform and processes thousands of orders daily. To deliver these orders, ABC has partnered with several courier companies in India, which charge them based on the weight of the products and the distance between the warehouse and the customer's delivery address. ABC wants to check if the fees charged by the courier companies for each order are correct.

ABC wants to compare the total weight of each order calculated using the SKU master with the weight stated by the courier company in their invoice. The weight should be rounded up to the nearest multiple of 0.5 kg to determine the weight of the tile. The warehouse PIN to all India Pincode mappings is used to determine the delivery area, which should be compared to the area reported by the courier company.

In addition, ABC must apply the logic of calculating charges based on the slab weight, delivery area and type of shipment listed on the courier company's invoice. The courier fee rate card provides a fixed fee and an additional fee for each weight plate and PIN. The total charge per shipment should be calculated by adding the fixed charge and any additional charges based on plate weight.

Data Description

ABC has internal data split across three reports: Website Order Report, Master SKU, and Warehouse PIN for all India Pincode mappings. In addition, they receive billing data from courier companies.

The website order report includes order IDs and products (SKUs) for each order. The SKU master provides the gross weight of each product, which is needed to calculate the total

weight of each order. Courier company invoices contain information such as AWB number, order ID, shipment weight, warehouse pickup PIN, customer delivery PIN, delivery area, the charge per shipment and type of shipment.

The final solution should include a table with the following columns:

Order ID	**Total Weight**	**Weight Slab**	**Delivery Zone as per ABC**	**Expected Charge as per ABC (Rs.)**	**AWB Number**	**Total Weight as per Courier Company (KG)**	**Delivery Zone Charged by Courier Company**	**Billing Amount (Rs.)**	**Weight Slab Charged by Courier Company (KG)**
2001827036	…	…	…	…	…	…	…	…	…
2001821995	…	…	…	…	…	…	…	…	…
…	…	…	…	…	…	…	…	…	…

ABC also wants to analyze the accuracy of the fees charged by the courier company. They require a summary table including the following information:

Description	**Count**	**Amount (Rs.)**
Total Orders where ABC has been correctly charged	…	…
Total Orders where ABC has been overcharged	…	…
Total Orders where ABC has been undercharged	…	…

Instructions:

- Import all the necessary libraries for your project
- Load and View all the datasets concerning the case study
- Are there any missing values in your dataframes?
- Now perform some data cleaning in your data

I. Remove unnamed columns from the Website Order Report, SKU Master and Pincode Mapping DataFrame
II. After performing those operations, view the dataframes again

- To ensure that our data becomes so useful, we'll have to wrangle some data columns
  I. Merge the order report and SKU master datasets according to the common SKU column
  II. 'ExternOrderNo' is nothing but 'Order ID' in other datasets. Rename this column to 'Order Id'.
  III. Merge the courier invoice and pincode mapping dataset, to do this firstly create a unique customer pin codes from the pincode mapping dataset and create a new DataFrame called "abc_courier" to store this information and continue from there.
  IV. Now merge the pin codes with the main dataframe
  V. Now let's calculate the weight in kilograms by dividing the 'Weight (g)' column in the 'merged2' DataFrame by 1000
  VI. Now let's calculate the weight slabs and create a new column named 'Weight Slab (KG)' from the merged dataframe
  VII. Rename the columns to prepare for the desired dataframe
  VIII. Calculate the expected charges and use your calculations to prepare a column 'Expected Charge as per ABC' as described in the case study.

  Hint! Store your values in a list
  IX. Now merge this dataframe with courier invoice according to the Order Id column to display the final dataframe
- Calculations
  I. Calculate the differences in charges and expected charges for each order:
  II. Summarize the accuracy of B2B courier charges based on the charged prices and expected prices. To do this calculate the ;
    a) Total orders in each category i.e. 'overcharged, correctly charged and undercharged.
    b) Total amount in each category
    c) And then proceed

  ***Your summary table must be the same as the one given in the Case Study**

- Draw a pie plot to visualize the proportion of errors made by the courier company
- Conclusions and some recommendations

"You may well have data, Smithers,
but I have strong opinions,
and I pay your wages"