Dear Data Analysis Interns,**Stage 5b: Designing a Dimensional Model for Sales Analysis and SQL QueriesOverview**:  
You are tasked with performing a comprehensive analysis of a car repair shop’s operations based on a sample [invoice](https://drive.google.com/file/d/1enihc1uFFW9dHPYFiBC27wpk92QodBC-/view?usp=sharing). The data includes information about customers, vehicles, jobs performed, parts used, and invoice summaries. Your goal is to extract meaningful insights using SQL and generate reports that can help the business optimize its operations, improve customer satisfaction, and increase profitability.  
You will first suggest a design for a dimensional model to analyze data based on what data you think is relevant for a sales analysis. This technique reinforces that a dimensional model should be a logical business view of data.**Part A**  
**Instructions**:  
Create a dimensional data model using MySQL Workbench and name it “DA-<slackusername>“.**Requirements**:  
The model will satisfy the following general needs:

* Analyze the sales performance of our car repair centers.
* Locations across western Canada.
* Provide flexible analysis of sales of both services and parts by customer, vehicle brand/model/year, and shop location.

**Sample Invoice:**  
A sample [invoice](https://drive.google.com/file/d/1enihc1uFFW9dHPYFiBC27wpk92QodBC-/view?usp=sharing) illustrates the information recorded for auto service. Using only this information, infer a design for a dimensional model. The sample invoice may contain information that is superfluous to the core purpose of the model; include only what is relevant for sales analysis.**Deliverables**:

* Prepare and submit a PDF of your dimensional model.

**Steps to Create the Dimensional Model:**

1. **Understand the Business Requirements:**

* Review the sample invoice and identify key pieces of information that are relevant for sales analysis.
* Determine the types of analysis the business will need, such as sales by customer, vehicle brand/model/year, services, parts, and shop locations.

1. **Identify Facts and Dimensions:**

* **Facts:** Determine the key metrics (facts) you need to analyze, such as service charges, parts charges, total sales, etc.
* **Dimensions:** Identify the attributes (dimensions) that will allow you to slice and dice these metrics, such as customer information, vehicle details, service types, part details, location information, and date/time of the transaction.

1. **Design Fact Table:**

* Create a table to store quantitative data related to sales. Ensure this table includes foreign keys to link to the dimension tables.

1. **Design Dimension Tables:**

* Create tables to store qualitative data for customers, vehicles, services, parts, locations, and dates. Ensure these tables are designed to support the fact table and facilitate detailed analysis.

1. **Create ER Diagram in MySQL Workbench:**

* Create tables for each fact and dimension.
* Define primary keys for each table.
* Establish foreign key relationships between the fact table and dimension tables.
* Ensure all necessary relationships between tables are defined.
* Ensure referential integrity between tables.
* Develop an Entity-Relationship diagram representing your fact and dimension tables.

1. **Document the Model:**

* Prepare a PDF document including:
* The ER diagram.
* Descriptions of each table and column.
* Logical explanations of your decisions in creating the tables from the sales receipt.

**Part B**  
Using an extended data of the Sales receipt that can be accessed [here](https://drive.google.com/drive/folders/1Cln8r2a9qNViOwa6Yo6X0vRwFkJ_Rkmj?usp=sharing), answer the following business questions using SQL.**Objectives**

1. **Data Ingestion and Preparation**

* Import the provided CSV files into a relational database.
* Ensure that the data is clean, properly formatted, and indexed for efficient querying.

1. **Data Analysis Tasks**
2. **Customer Analysis:**

* Identify the top 5 customers who have spent the most on vehicle repairs and parts.
* Determine the average spending of customers on repairs and parts.
* Analyze the frequency of customer visits and identify any patterns.

1. **Vehicle Analysis:**

* Calculate the average mileage of vehicles serviced.
* Identify the most common vehicle makes and models brought in for service.
* Analyze the distribution of vehicle ages and identify any trends in service requirements based on vehicle age.

1. **Job Performance Analysis:**

* Determine the most common types of jobs performed and their frequency.
* Calculate the total revenue generated from each type of job.
* Identify the jobs with the highest and lowest average costs.

1. **Parts Usage Analysis:**

* List the top 5 most frequently used parts and their total usage.
* Calculate the average cost of parts used in repairs.
* Determine the total revenue generated from parts sales.

1. **Financial Analysis:**

* Calculate the total revenue generated from labor and parts for each month.
* Determine the overall profitability of the repair shop.
* Analyze the impact of sales tax on the total revenue.

1. **Optimization Recommendations**

* Based on your analysis, provide actionable recommendations to optimize operations, such as:
* Identifying underperforming services that may need improvement or marketing efforts.
* Suggesting parts that should be kept in higher stock due to frequent usage.
* Proposing customer loyalty programs for top-spending customers.
* Recommending scheduling adjustments to better manage frequent job types.

**Deliverables**

1. **Database Setup:**

* A relational database containing the imported data from the CSV files.
* SQL scripts used to create tables and import data.

1. **Analysis Report:**

* A comprehensive report detailing your analysis, findings, and insights (add screenshots of your query results).
* SQL queries used for data analysis.

1. **Visualizations:**

* Graphs and charts illustrating key findings from your analysis.

the customer can we break the address into street, city,state, postcode just a suggestion or example