# DAD 220 Project Two

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## RMA Report

Write a report to respond to the manager’s requests. In the report, you should complete the following actions:

* Summarize the data you’ve been working with.
* Identify key information that will help the company streamline operations.

Your report should explain your findings in a way nontechnical stakeholders can understand and use.

Use the steps below to capture the required data and produce the analysis report.

1. Begin by writing SQL commands to **capture** specific **usable data** for your analysis. You already preloaded the data you need into Codio.
2. Specifically, the product manager wants you to complete the following analysis:
   1. **Analyze** the number of **returns by state** and describe findings to include in your report.

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Based on the extracted return data by state, Massachusetts leads with 972 returns, significantly higher than any other state. It is followed by Arkansas (844), Oregon (840), and West Virginia (837). These return volumes may indicate regional differences in customer expectations, order fulfillment challenges, or product-related issues. Interestingly, large states typically associated with higher order volumes, such as California (764), Texas (755), and Florida (765), exhibit moderate return counts compared to smaller states.

On the lower end of the spectrum, South Carolina (702), New Jersey (711), Colorado (718), and Georgia (719) report the fewest recorded returns. This could reflect more efficient delivery operations, higher customer satisfaction, or fewer orders overall.

The difference between the highest and lowest state-level return counts is substantial, with a range of 270 returns (from 702 in South Carolina to 972 in Massachusetts). Most states fall within the 700–850 return range, suggesting a relatively tight cluster of return behavior with a few notable outliers.

Key Observations:

* Massachusetts (972) is an outlier and may require focused investigation to understand return causes and trends in that region.
* Several midwestern and southern states, such as Arkansas, West Virginia, and Alabama, also rank high on returns, potentially pointing to supply chain, demographic, or support experience factors.
* California, Texas, and Florida do not top the return list despite their population size and likely higher transaction volumes. This raises the question of whether they have better operational efficiencies or differing customer expectations.
  1. **Analyze** the percentage of **returns by product type** and describe findings to include in your report.

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This analysis evaluates the distribution of product returns by product type (SKU), highlighting which items contribute the most to return volume. By calculating the percentage share of each SKU’s returns, we can identify potential quality, fit, or satisfaction issues with specific products.

Products with a high percentage of returns may indicate problems with product quality, customer expectations, or inaccurate product descriptions. For instance, if a single SKU accounts for a disproportionately large share of returns (e.g., over 20%), this could suggest a systemic issue that requires immediate investigation or supplier follow-up. Conversely, SKUs with consistently low return rates may represent the best-performing products in terms of customer satisfaction and fulfillment accuracy.

The return data by SKU reveals that certain products account for a disproportionate share of overall returns. Notably:

* BAS-48-1 C is the most returned product, representing 22.05% of all returns (8,282).
* ENT-48-40F follows with 16.29% (6,118 returns), and ENT-48-10F with 11.41% (4,287 returns).
* The top 5 SKUs (BAS-48-1 C, ENT-48-40F, ENT-48-10F, BAS-08-1 C, and ENT-24-10F) account for over 72% of all returns.

This concentration suggests a strong product-based return trend—these products may have:

* Higher shipment volumes (thus more returns by scale),
* Quality or compatibility issues,
* Misalignment with customer expectations,
* Or inadequate product descriptions.

On the other hand, BAS-24-1 C had only 33 returns, making up just 0.09% of the total, indicating high product satisfaction or low sales volume.

Key Recommendations:

* Conduct a root-cause analysis for top-returned SKUs (especially BAS-48-1 C and ENT-48-40F).
* Correlate return rates with sales volumes for each SKU to determine if high returns are due to popularity or underlying issues.
* Reassess product descriptions, packaging, or quality assurance procedures for high-return SKUs.

1. Write a report to clearly **summarize** your RMA **data analysis** for stakeholders. When you summarize the results, consider the following questions:
   1. How does the data provide the product manager with usable information?
   2. What are the potential flaws in the data that has been presented?
   3. Are there any limitations on your conclusions or any other ways of looking at your findings that you haven’t considered? Clearly communicate your findings to stakeholders.

This report provides a strategic overview of return activity across regions and product types to support operational improvements and decision-making. Two core areas were evaluated: geographic return trends by state and return frequency by product category (SKU).

The geographic analysis revealed that certain states, such as Massachusetts, Arkansas, and Oregon, are experiencing significantly higher return volumes than others. These regional disparities may indicate underlying issues in fulfillment accuracy, product suitability, or distribution logistics in those locations. Conversely, other states, such as South Carolina and New Jersey, exhibit comparatively lower return activity, which could suggest either fewer transactions or higher customer satisfaction. Identifying regional return trends enables the company to target operational enhancements through localized process audits, customer service improvements, or fulfillment adjustments.

From a product perspective, a concentrated SKU group accounts for most returns. Specifically, five products constituted over 70% of all return activity. One product alone accounted for over 20% of returns, suggesting a potential misalignment with customer expectations or consistent quality concerns. Meanwhile, some products had very low return rates, which may signal a strong product-market fit and effective design or communication. These insights allow for targeted product reviews and improvements, supporting product development and marketing teams to focus their efforts where they are most needed.

The return data provides product managers valuable, actionable insights into where challenges may arise in product design and operational execution. By identifying which product types are most frequently returned and which regions show the highest return volumes, the data reveals potential weak points in the customer experience. For example, certain SKUs may consistently underperform due to quality issues, poor packaging, or misaligned expectations during marketing and sales. Similarly, state-by-state variations in return volume can highlight logistical inefficiencies, such as inconsistent delivery practices or regional service gaps. These insights enable product managers to prioritize deeper investigations, initiate corrective measures with suppliers, or adjust go-to-market strategies to meet customer needs better.

However, the data is not without flaws. One key limitation is the lack of normalization by order volume. A high number of returns for a particular product or region may reflect high sales volume, which is not necessarily problematic. Without a return rate, it becomes challenging to assess actual performance. Additionally, the aggregated dataset does not include information about the reasons behind item returns. Understanding whether returns stem from defects, incorrect shipments, or customer dissatisfaction is crucial for developing targeted solutions. Without this context, interventions may be misdirected or fail to address the underlying issues.

There are also broader limitations in the current scope of analysis. The findings presented here reflect a snapshot in time without considering seasonality, product launch cycles, or promotional events that may influence return behavior. Some spikes in returns may relate to temporary conditions rather than systemic issues. Furthermore, the analysis does not incorporate demographic or behavioral data, which could provide additional context about customer segments that are more prone to returns. Communicating these caveats ensures stakeholders understand the insights’ value while remaining aware of the need for deeper, more contextualized analysis moving forward.

In conclusion, while the return patterns offer clear insights into operational and product-level issues, further analysis incorporating return reasons, sales volume, and time trends is recommended. This would provide a more comprehensive view of product performance and customer experience, equipping stakeholders with deeper context to guide strategy, improve product offerings, and streamline operations across the business.