# Cost Of Living Analysis

The domain of the Project

Cost Of Living Analysis
(Power BI)

Under the guidance of
Mrs.Siddhika Shah

By
Mr.Sandeeep.P
B.E Mechanical Engineering

Period of the project
February 2025 to March 2025

SURE TRUST PUTTAPARTHI,
ANDHRA PRADESH

# DECLARATION

The project titled **"*Cost Of Living Analysis*"** has been mentored by **Mrs.Siddhika Shah** and organized by SURE Trust from February 2025 to March 2025**.** This initiative aims to benefit educated unemployed rural youth by providing hands-on experience in industry-relevant projects, thereby enhancing employability.

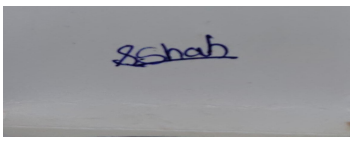
I, **Sandeep P** hereby declare that I have solely worked on this project under the guidance of my mentor. This project has significantly enhanced my practical knowledge and skills in the domain.

**Name**
Mr. Sandeep P

**Signature**

**Mentor**
Mrs.Siddhika Shah

**Signature**



**Seal & Signature**

Prof.Radhakumari
Executive Director & Founder
SURE Trust

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# *Executive Summary*

Cost of living analysis typically involves comparing the expenses associated with living in different geographic areas. This can include a variety of factors such as housing, transportation, food, healthcare, education, taxes, and entertainment. Here is a general framework for conducting a cost of living analysis.

This data-set provides insights into the cost of living and average monthly income across various countries and regions worldwide from 2000 to 2023.
It includes critical economic indicators such as housing costs, taxes, healthcare, education, transportation expenses, and savings rates. The data is ideal for analyzing economic trends, regional comparisons, and financial planning.

# *Introduction*

**Background and Context**
Understanding the cost of living is essential for various stakeholders, including residents, employers, and government entities. As people relocate for jobs, education, or lifestyle preferences, knowing the cost of living in a new area becomes crucial.

**Problem Statement**
The regional cost of living analysis aims to quantify and compare the cost of living across different regions. This analysis can inform individuals, businesses, and policymakers on economic disparities, assist in making informed financial decisions, and contribute to socioeconomic planning. By examining various components such as housing costs, transportation, healthcare, and groceries, the objective is to identify significant differences in the cost of living, understand the driving factors behind these differences, and provide insights that can aid in budget planning, salary negotiations, and economic development initiatives.

**Scope**

This project focuses on building a multi-page interactive Power BI dashboard with the following components:

**Scope of the Regional Cost of Living Analysis**

The scope of the regional cost of living analysis encompasses various dimensions that provide a comprehensive understanding of living expenses in different regions. This analysis can be segmented into several key areas:

1. **Geographical Coverage**:
The analysis will include multiple regions (e.g., cities, states, countries) to ensure a comparative overview of how the cost of living varies across different areas.
A focus on both urban and rural areas to highlight disparities in living costs based on location.

2. **Components of Cost of Living**:
**Housing**: Examination of rent, home prices, and property taxes.

**Utilities**: Analysis of costs for electricity, water, gas, and internet services.

**Transportation**: Evaluation of public transportation fares, fuel costs, and vehicle maintenance.

**Groceries and Food**: Comparison of food prices, dining out costs, and grocery stores.

**Healthcare**: Study of medical expenses, insurance premiums, and associated healthcare costs.

**Miscellaneous Expenses**: Consideration of other factors such as entertainment, childcare,education, and personal care items.

3. **Temporal Aspects**:

Analysis of historical trends in the cost of living to identify patterns over time, such as inflation effects and shifts in consumer preferences.

Potential inclusion of predictive analytic to forecast future cost trends based on historical data.

4.**Demographic Variables**:

Investigation of how demographic factors (e.g., income levels, age groups, family size) influence the cost of living.

Comparison of cost impacts on different socioeconomic groups to understand disparities and access to resources.

5.**Data Analysis Techniques**:

Utilization of statistical methods to analyze the data set, such as descriptive statistics, regression analysis, and correlation studies.

Visualization of data through graphs and charts to present findings clearly and effectively.

6. **Stakeholder Impact**:

- Assessment of how different stakeholders (individuals, families, businesses, policymakers) can use the insights gained from the analysis.
- Recommendations for each stakeholder on how to strategically manage finances in light of the findings.

7.**Limitations and Considerations**:

Acknowledge limitations of the data set, such as potential biases, data accuracy, and regional data availability.

Consideration of external factors (e.g., economic conditions, labor market fluctuations) that may affect the cost of living but are not captured in the data set.

**Deliverables**

A comprehensive report detailing findings, trends, and recommendations.
Visualizations illustrating key insights and comparisons across regions.
A presentation summarizing major findings and implications for stakeholders.

By clearly defining the scope, the analysis will focus on delivering valuable insights into the cost of living, helping stakeholders make informed choices based on data-driven evidence.

**Innovation**

This project is unique in its ability to provide a 360-degree view of Amazon sales performance using Power BI. It integrates various data fields—such as product categories, city-wise sales, customer reviews, and delivery statuses—into a cohesive visual format. By using DAX measures and interactive visuals, the dashboard empowers users to make data-backed decisions quickly. The automation of insights and the visual storytelling element make this project a valuable tool for e-commerce analysis and future BI enhancements.

# *Project Objectives*

## Project Objectives:

### 1. Data Cleaning and Preparation

To per-process and transform raw datasets into a structured format suitable for analysis in Power BI. This includes handling missing values, renaming columns, changing data types, and creating calculated columns/measures using DAX.

### 2. Data Modeling

To establish relationships between different tables such as sales data, product details, and shipping status. This step ensures that slicers and visuals work cohesively and allows for dynamic filtering across the dashboard.

### 3. Visual Design and Layout

To create an intuitive and visually appealing dashboard by organizing charts, tables, slicers, and KPIs in a clean layout. Emphasis is placed on clarity, interactivity, and ease of navigation between multiple report pages.

### 4. DAX Measures and Calculations

To develop meaningful calculations using DAX formulas, such as total sales, total units, returns, and customer reviews. These measures provide business-specific insights and allow users to compare performance across different dimensions.

### 5. Interactive Features and Filters

To enable interactivity through slicers (e.g., date, category, status) and navigation buttons. These features empower users to explore data dynamically and focus on specific subsets of interest without modifying the underlying dataset.

## Expected Outcomes:

**Sales Dashboard showing:**

- Total statistics
- Cost of Living in states and cities
- Time-based Slicers

**Expected Outcomes of the Regional Cost of Living Analysis Project**

The regional cost of living analysis is expected to generate several key outcomes that will provide valuable insights for individuals, businesses, and policymakers. Here are the anticipated outcomes:

1.**Comprehensive Cost Comparison**:
A detailed comparison of the cost of living across different regions, highlighting which areas are more affordable or expensive, and by how much. This will enable individuals and families to make informed relocation decisions based on their financial circumstances.

2.**Identification of Key Drivers**:
Analysis of the various components contributing to the cost of living, allowing for the identification of specific factors (e.g., housing, transportation, utilities) that significantly impact living expenses in different regions. This understanding can help identify areas where costs could be managed or reduced.

3.**Trend Analysis**:
Insights into historical trends in the cost of living, identifying patterns over time, such as the impact of inflation and economic events. These trends can inform predictions about future living costs, helping stakeholders plan economically.

4.**Demographic Insights**:
A better understanding of how the cost of living affects different demographic groups. This may include variations based on income levels, family size, and age, leading to tailored recommendations for specific groups.

5.**Decision-Making Tools**:
Development of tools or models (potentially interactive) that help users assess the cost of living in various regions relative to their income, lifestyle needs, and preferences, supporting better decision-making in job relocation or housing choices.

6. **Policy Recommendations**:
Evidence-based recommendations for policymakers regarding economic development strategies and social services. Insights from the analysis could inform decisions on where to allocate resources and how to address disparities in living costs, particularly in underserved regions.

7.**Business Insights**:
Valuable insights for businesses looking to expand or hire in different regions. Understanding regional costs can aid in setting competitive salaries, adjusting pricing strategies, or targeting specific demographic groups.

8.**Visualizations and Reporting**:
Creation of clear and engaging visualizations that summarize key findings, making it easier for stakeholders to understand the complexities of the cost of living data. This could include interactive dashboards, graphs, and charts that highlight regional comparisons and trends.

9. **Public Awareness**:
Increased awareness among the general public regarding the costs associated with living in different regions, helping individuals to better understand how these costs can affect their quality of life, savings, and long-term financial planning.

10.**Future Research Directions**:
Identification of gaps in the existing data or new questions that arise during the analysis, suggesting potential avenues for further research or additional datasets that could enhance future studies.

Through these expected outcomes, the project aims to provide comprehensive insights into the regional cost of living, facilitating better financial planning and policy-making across various sectors of society.

**Operational Benefits:**

- Enhanced decision-making by minimizing the need for manual data analysis
- A scale able Power BI solution that can be updated easily with new datasets or extended with features like trend forecasting or automated alerts.

# *Methodology and Results*

**Methods/Technology Used:**

The project applies Data Analytic and Business Intelligence (BI) methodologies to transform raw Amazon sales data into meaningful insights. It includes:

- **Data pre-processing**: Cleaning and transforming the sales, product, and order status data using Power Query Editor in Power BI.
- **Data modeling**: Establishing relationships between tables (e.g., sales, products, reviews, and shipping), and creating DAX measures for calculations like total sales, units, and returns.
- **Interactive visualization**: Utilizing bar charts, line graphs, slicers, and buttons to uncover patterns in sales trends, product performance, and regional distribution.
- **Descriptive analysis**: Summarizing sales history to show what products and locations contributed most to revenue and units sold.

**Tools/Software Used:**

- **Microsoft Power BI Desktop**: Primary tool for dashboard creation, data modeling, and interactive visualization.
- **Power Query Editor**: Used for cleaning, filtering, and shaping the data before analysis.
- **DAX (Data Analysis Expressions)**: For creating custom KPIs, aggregations, and calculations.
- **Excel/CSV Files**: Data source format used for importing Amazon sales and product data.
- **MS Excel or Google Sheets**: For initial inspection or minor data adjustments before loading into Power BI.

**Data Collection Approach:**

**Dataset**:The data is collected by GitHub available projects.

**Project Architecture:**

**Data Cleaning:**

Remove duplicates, handle missing values, and correct inaccuracies in the data Standardize data formats (e.g., currency adjustments, date formats).

**Data Analysis Layer**

**Statistical Analysis:**Employ statistical techniques (e.g., regression analysis, correlation analysis) to analyze relationships between cost of living components and demographic factors.

**Comparative Analysis:**Use comparative metrics to evaluate differences in cost of living between regions.

**Trend Analysis:**Analyze historical data to identify trends in living costs over time, using time series analysis.

**Data Visualization Layer**

**Visualization Tools:**

Create dashboards that summarize key findings and allow users to explore data dynamically.

**Reports:**Generate comprehensive reports that include visual data representations, analysis results, and recommendations.

**Results Interpretation Layer**

**Insights Generation:**

Assess findings to derive meaningful insights regarding regional cost differences.

Review demographic impacts and identify notable trends.

**Recommendations:**

Formulate strategic recommendations based on insights for individuals, businesses,

and policymakers.

**User Interface Layer**

Develop a user-friendly web application that allows stakeholders to interact with the analysis results, perform cost comparisons, and visualize data.

**Feedback Loop**

**User Feedback**:Regular updates to the data and methodology based on user feedback and changing economic conditions.

## Results

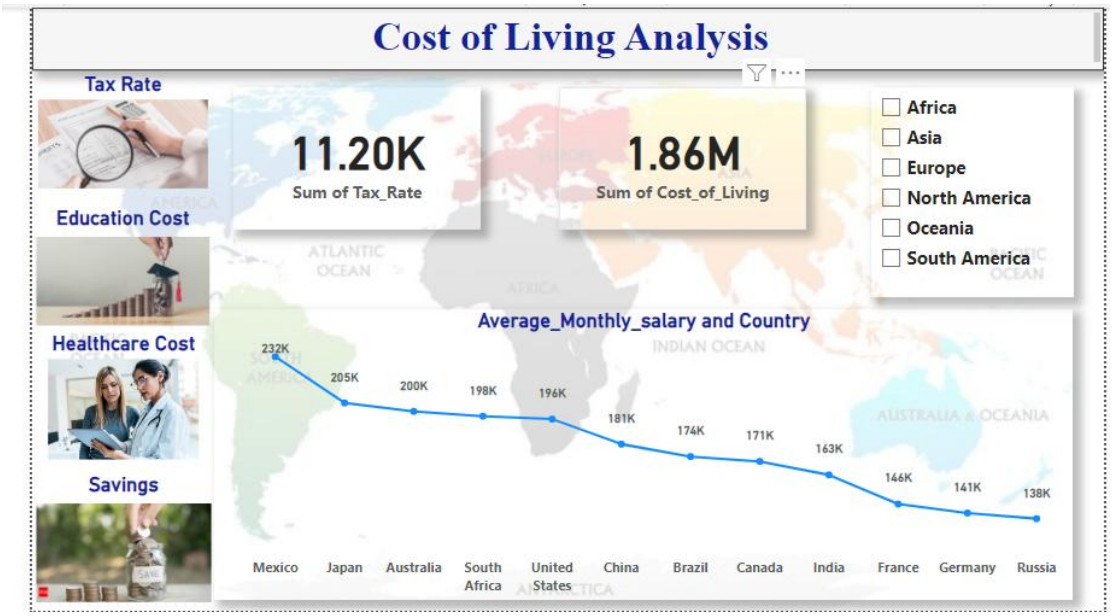
**Regional Disparities**: Clear identification of which regions are more expensive or affordable compared to others, enabling users to make informed decisions (e.g., for relocation, job opportunities).

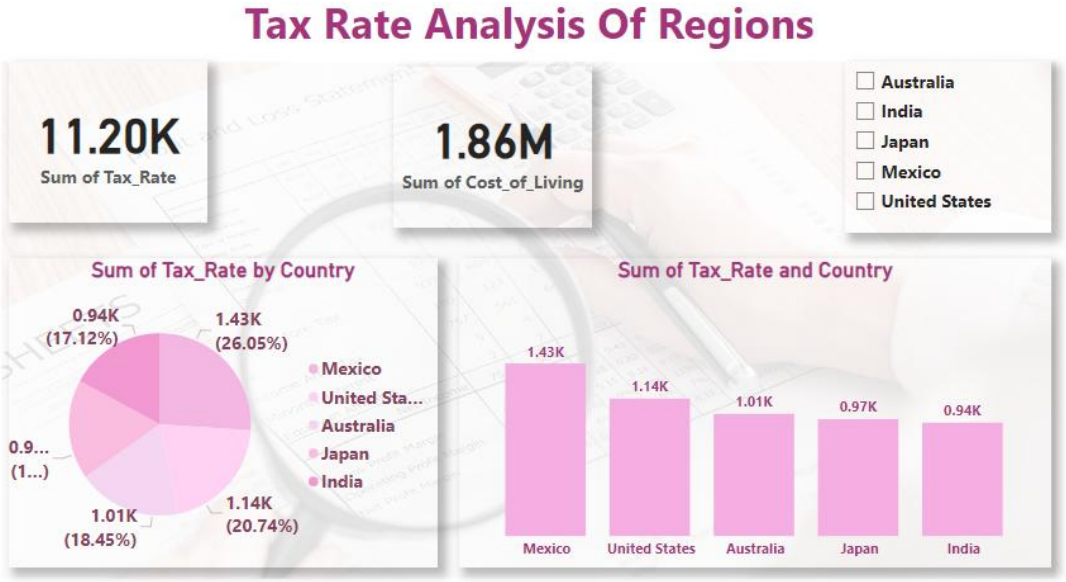
**Cost Trends**: Observations on how costs are changing over time, helping users anticipate future expenses and budget accordingly.

**Expense Management**: Identification of areas where individuals or families can realistically adjust their budgets, based on localized cost information.

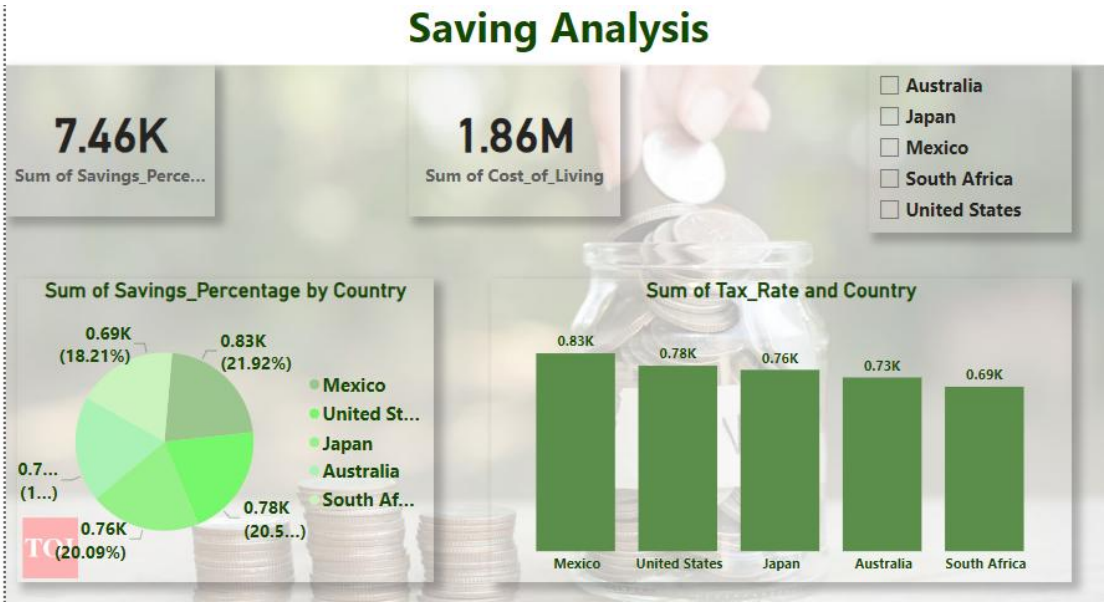
**Purchasing Power Analysis**: Insights on how various demographic groups are affected by cost of living in different regions, highlighting any inequities.

# Final Project Working Screenshots



- **Dashboard**


Saving Analysis
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Sum of Cost_of_Living
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Japan
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South Africa
United States
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0.78K (20.5...)
0.76K (20.09%)
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United St...
Japan
Australia
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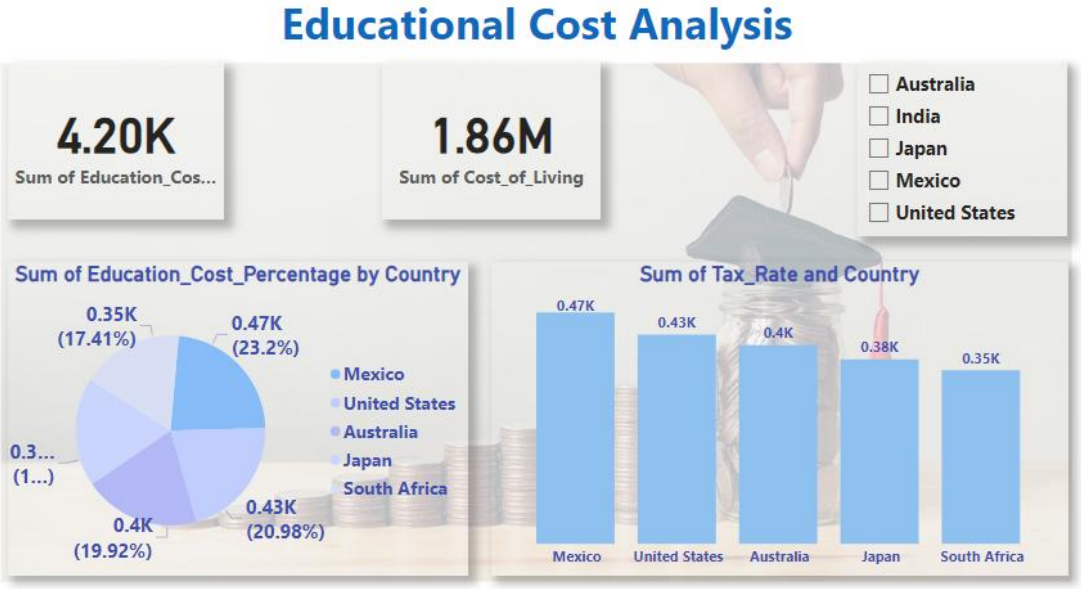
Australia
South Africa


Educational Cost Analysis
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1.86M
Sum of Cost_of_Living
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0.47K (23.2%)
0.43K (20.98%)
0.4K (19.92%)
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United States
Australia
Japan
South Africa
Sum of Tax_Rate and Country
0.47K
0.43K
0.4K
0.38K
0.35K
Mexico
United States
Australia
Japan
South Africa

# GitHub Link

https://github.com/SandeepPG2FSDS/powerbi

# *Learning and Reflection*

## Learning and Reflection

Dashboard Overview Page
**Title and Description**: A clear title indicating that the dashboard is focused on the cost of living analysis, alongside a brief description of its purpose.

**Key Performance Indicators (KPIs)**
Overall Cost of Living Index: A KPI showing the aggregated cost of living index for a selected region compared to a national average.
Housing Costs: Average monthly rent or mortgage payments in the selected regions.

**Geographical Representation**

**Map Visualization**: An interactive map displaying different regions with color-coded cost of living indices or average expenses. Users can hover over or click on regions to see detailed data.

**Region Comparison**: A comparative chart or visual that enables users to select multiple regions and compare their cost of living components side by side.
Breakdown by Expense Category

**Pie/Donut Chart**: A visual showing the percentage breakdown of major expense categories (housing, transportation, food, healthcare, entertainment) for a selected region.

**Bar Chart**: A side-by-side bar chart comparing different categories across selected regions, allowing users to identify areas of high expenditure.
Trend Analysis

**Line Chart**: Visualizes trends over time for the cost of living index, housing prices, or utility costs. Users can apply filters to view different regions or time periods.

**Moving Average**: Include a moving average trend-line to show long-term trends against short-term fluctuations.
Income vs. Cost Analysis

**Stacked Bar Chart**: Compare average income levels against average cost of living to show purchasing power disparities across regions.

**Affordability Index**: A calculated metric displayed in a card visualization detailing the ratio of income to living expenses for different demographics.
Demographic Insights

**Demographic Filters**: Allow users to filter data based on specific demographics (age, family size, etc.) to see how costs vary according to different population segments.

**Table View**: Include a detailed tabular breakdown showing expenses for various demographic groups within selected regions.
Interactive Filters

**Slicers**: Interactive filters allowing users to set parameters such as time frames, regions, or cost categories, enabling customized views of the data.
Bookmarks: Save custom views that users can easily access, showcasing their specific interests within the data.

**Tooltips**: When hovering over visuals, provide additional context or breakdowns to enhance user understanding.
Help Section: Include a brief guide or help section explaining how to use the dashboard effectively.

**Expected Insights from the Dashboard**

Regional Disparities: Clear identification of which regions are more expensive or affordable compared to others, enabling users to make informed decisions.

**Cost Trends**: Observations on how costs are changing over time, helping users anticipate future expenses and budget accordingly.

**Expense Management**: Identification of areas where individuals or families can realistically adjust their budgets, based on localized cost information.

**Purchasing Power Analysis**: Insights on how various demographic groups are affected by cost of living in different regions, highlighting any inequities.

## *Conclusion and Future Scope*

### Objectives

The primary goals of this project were to:

1. **Clean and Prepare Raw Data**
   Transform raw Amazon sales and product data into a clean and structured format using Power Query Editor.
2. **Build Interactive Dashboards**
   Design dynamic, multi-page dashboards that visualize sales performance, product trends, and geographic distribution.
3. **Perform Data Modeling**
   Create relationships between sales, products, and order status tables, and define calculated columns and DAX measures for key metrics.
4. **Visualize Key Insights**
   Use visuals such as bar charts, line graphs, cards, and slicers to highlight sales patterns, best-selling products, and high-return regions.
5. **Enable User Interactivity**
   Allow users to explore data interactively by filtering through date ranges, product categories, and delivery statuses.
6. **Enhance Decision Making**
   Equip business stakeholders with insightful visuals that support quicker, data-driven decisions in areas like sales strategy and logistics.
7. **Ensure Scalability**
   Develop the dashboard with flexibility to incorporate additional data sources or advanced analytic features like forecasting in the future.
8. **Improve Analytical Skills**
   Strengthen proficiency in data visualization, dashboard building, and applying BI tools like Power BI and DAX for real-world analysis.

## Achievements

1. **Successfully Designed Sales Dashboards**
   Developed a multi-page Power BI dashboard to visualize Amazon sales performance, product insights, and geographic trends using interactive visuals and slicers.
2. **Advanced Data Modeling**
   Established clear relationships between sales, product, and order status tables; created calculated columns and DAX measures to generate meaningful KPIs such as total sales, units sold, and returns.
3. **Data Transformation and Cleaning**
   Used Power Query Editor to clean raw datasets by removing duplicates, correcting data types, renaming columns, and preparing the data for seamless analysis.
4. **Insightful Visualizations**
   Created impact visual elements including bar charts, line graphs, cards, and slicers that highlight top-performing products, review patterns, and region-wise sales distribution.
5. **User-Friendly Interface**
   Built an intuitive, easy-to-navigate dashboard layout that allows users to interact with data using category filters, date slicers, and status selection for focused analysis.
6. **Demonstrated Analytical Thinking**
   Uncovered valuable insights such as best-selling cities, high-return products, and sales trends—demonstrating strong analytical reasoning and business understanding.
7. **Scalability and Future-Readiness**
   Designed the dashboard to be scale able, allowing for the future integration of live data, trend forecasting, and additional analytical features.
8. **Skill Development**
   Enhanced hands-on skills in Power BI, DAX, data modeling, and visual storytelling—boosting both technical expertise and real-world data analysis capability.

## Conclusion

Learning and reflection are essential practices that foster continuous improvement and development. By actively engaging in self-reflection and seeking feedback, individuals and teams can analyze their experiences, extract meaningful lessons, and enhance their performance in future endeavors. By integrating reflection into daily routines and learning processes, a more profound comprehension and application of knowledge can be achieved, ultimately leading to better decision-making and outcomes

## Future Scope

1. **Mobile-Friendly Dashboards**

Optimize the dashboard design for mobile use, ensuring that users can access insights anytime and anywhere, enhancing usability and accessibility.

2. **Expansion to Other Retail Data**

Extend the dashboard to include additional datasets like customer feedback, marketing performance, or seasonal sales trends, making it a more comprehensive and scale able BI solution for retail analytic.

3.**Enhanced Learning Analytic**: As organizations increasingly adopt data analytic and AI technologies, there is a significant opportunity to leverage these tools for learning and reflection. For instance, platforms that utilize AI can analyze individual and team performance data, providing insights and personalized feedback. This can help individuals identify strengths and weaknesses, optimize learning paths, and facilitate targeted professional development.

**4.Adaptive Learning Systems**:

The future may see the development of adaptive learning technologies that tailor educational content and experiences to individual learning styles and preferences. By incorporating insights from ongoing reflections, these systems can evolve in real-time, promoting deeper engagement and more effective learning outcomes.