Bicycle Sales Analytics Using IBM Cognos

A Project Report

Data Analytics

Submitted By:

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Link to Video:

Introduction

Overview

Adventure Works is a sample database created for use in demos and training on each version of Microsoft SQL Server. The name Adventure Works refers to a fictitious large, multinational bicycle manufacturing company. "The company manufactures and sells metal and composite bicycles to North American, European and Asian commercial markets. While its base operation is located in Washington with 290 employees, several regional sales teams are located throughout their market base. In 2000, Adventure Works Cycles bought a small manufacturing plant, in Mexico. This manufactures several critical subcomponents for the Adventure Works Cycles product line. In 2001, they became the sole manufacturer and distributor of the touring bicycle product group. Coming off a successful fiscal year, Adventure Works Cycles is looking to broaden its market share by targeting their sales to their best customers, extending their product availability through an external Web site, and reducing their cost of sales through lower production costs."

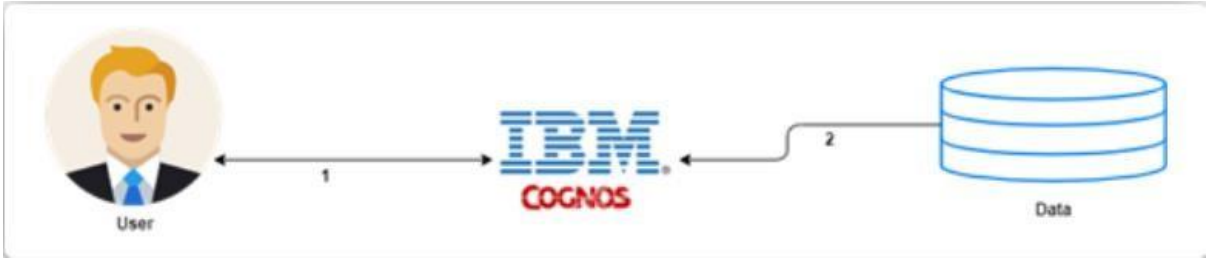
Goal

Goal of this problem statement is to find and provide various Sales Analytics for the improvement of the Organization.

The main objective to do this project was to:

- Know Fundamental concepts and can work on Cognos Analytics
- Able to Analyze the given problem using Forecasting, Trend Lines
- Build Scatter and Density Plots, Correlation Matrix.
- Gain a broad understanding of plotting different graphs
- Able to create meaningful dashboards

Architecture



I am using IBM cognos to work work with the dataset of Adventure Works to visualize the feasible solutions and provide various Sales Analytics For the Improvement of the Organization.

Project Flow:

1. **Log in to IBM Account**

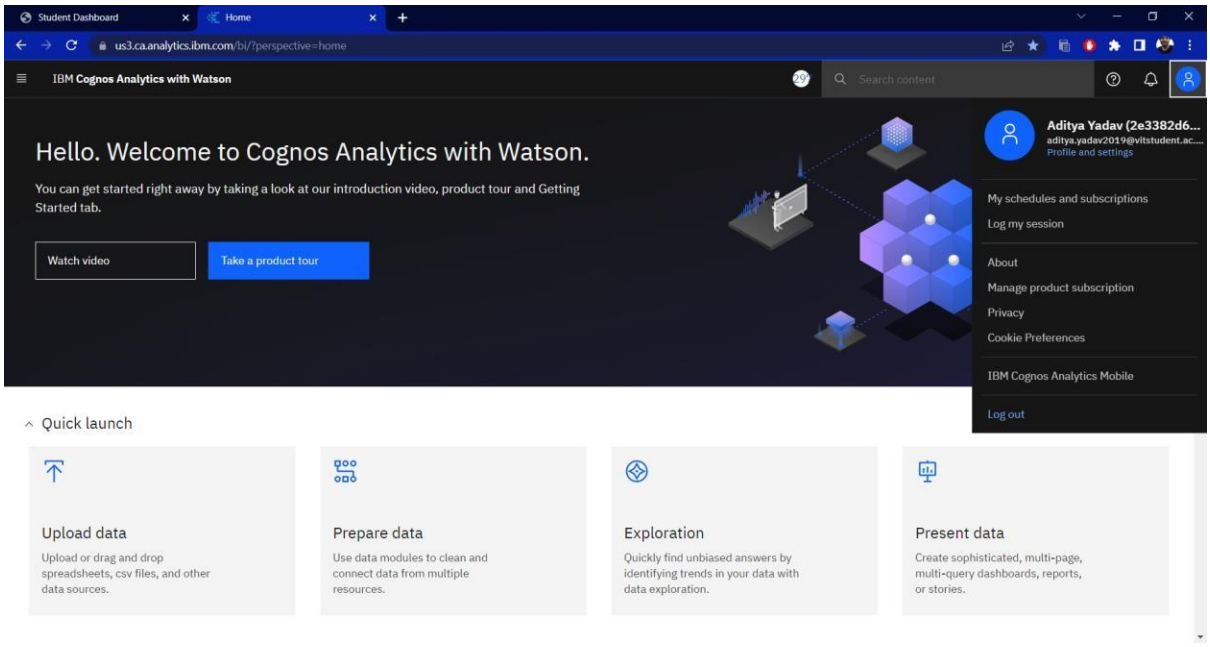


Fig: logging in to IBM account

2. Understanding the dataset

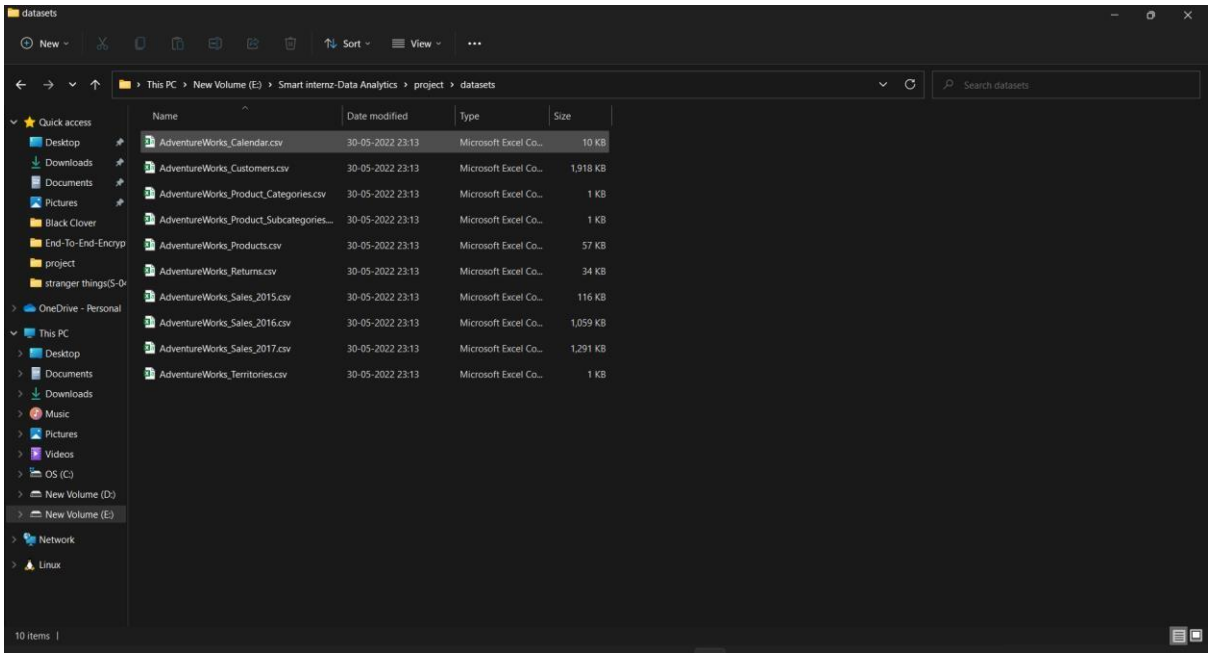


Fig: downloading and understanding the dataset

3. Loading Of Dataset

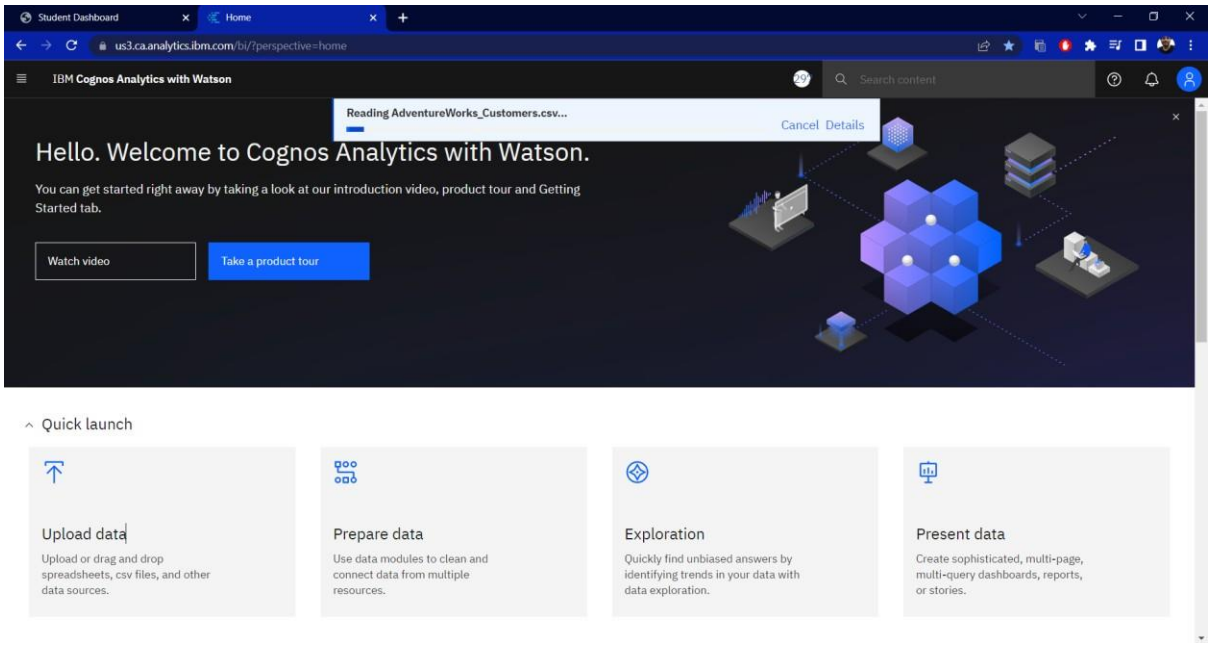


Fig: Uploading single dataset(adventureworks_customers.csv)

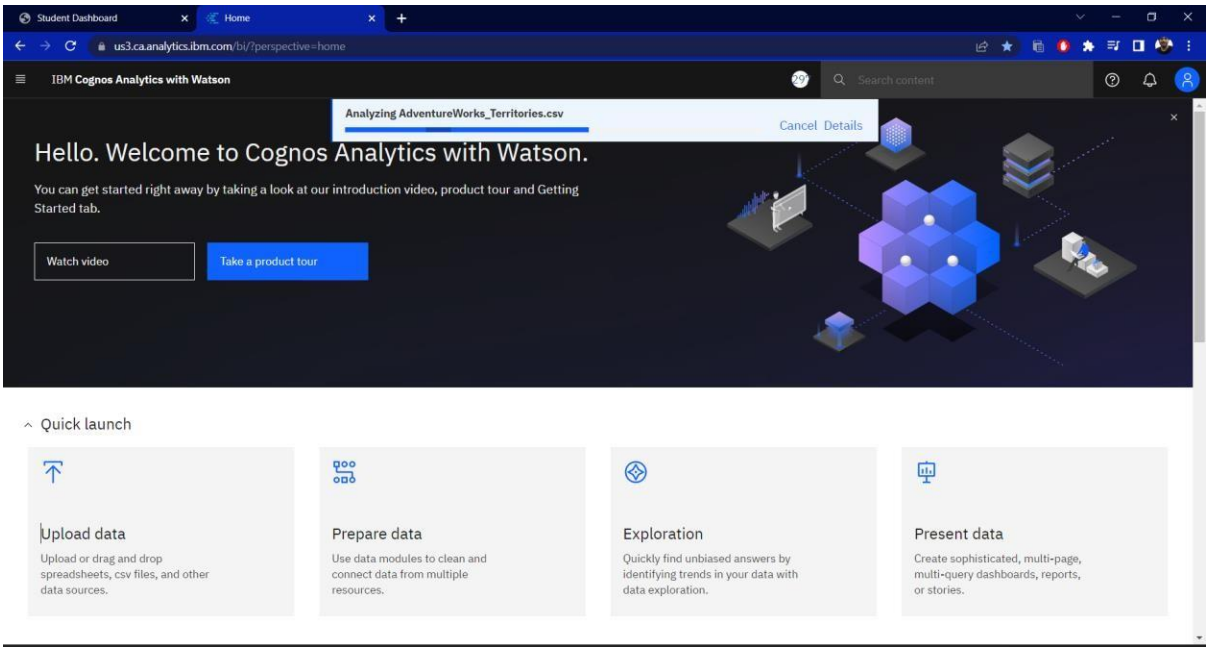


Fig: uploading multiple datasets

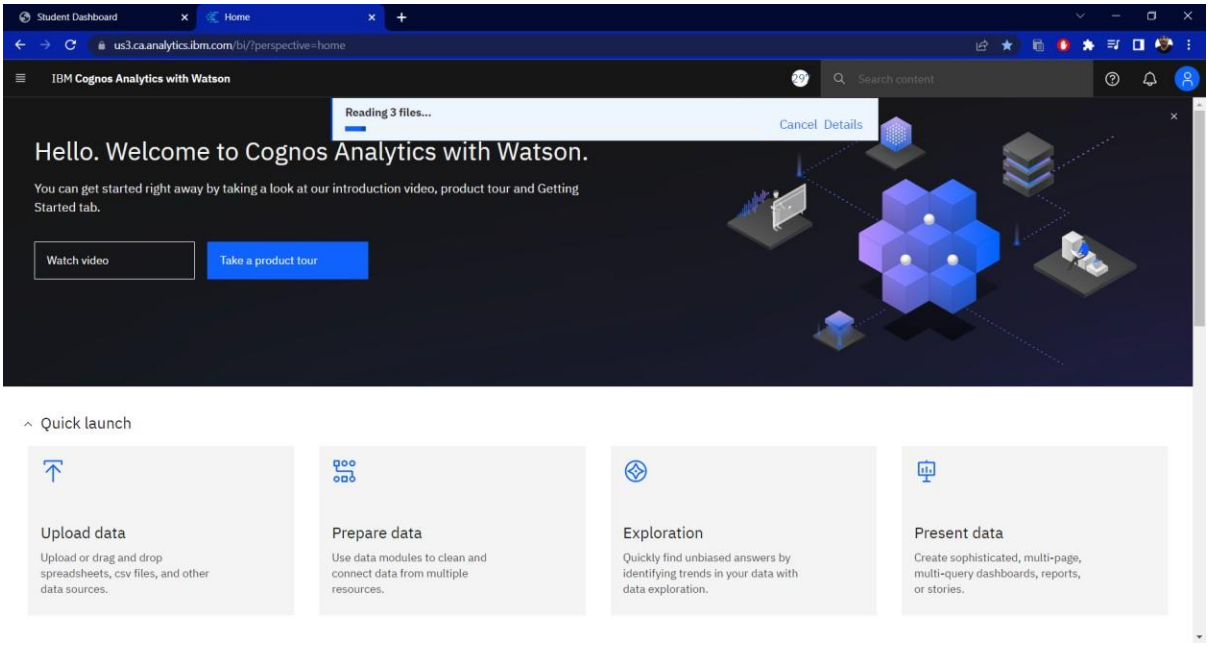


Fig: uploading sales dataset of 2015,2016,2017

4. Data Preparation – Union And Joins Of The Dataset

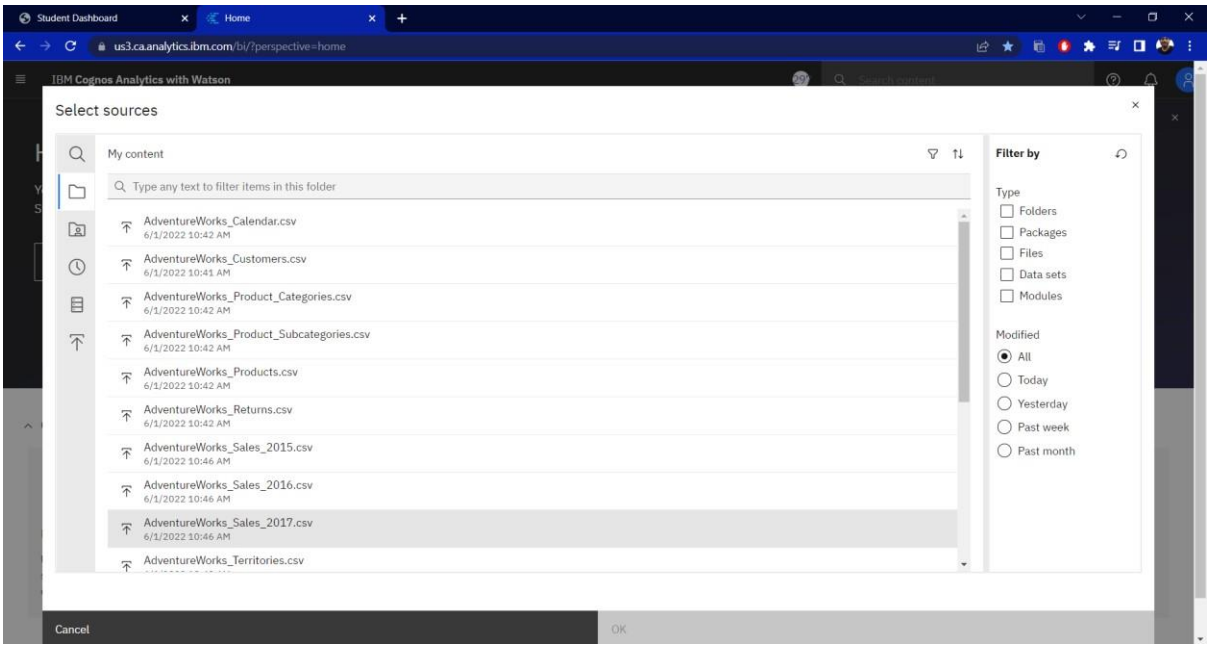


Fig: Preparation of data

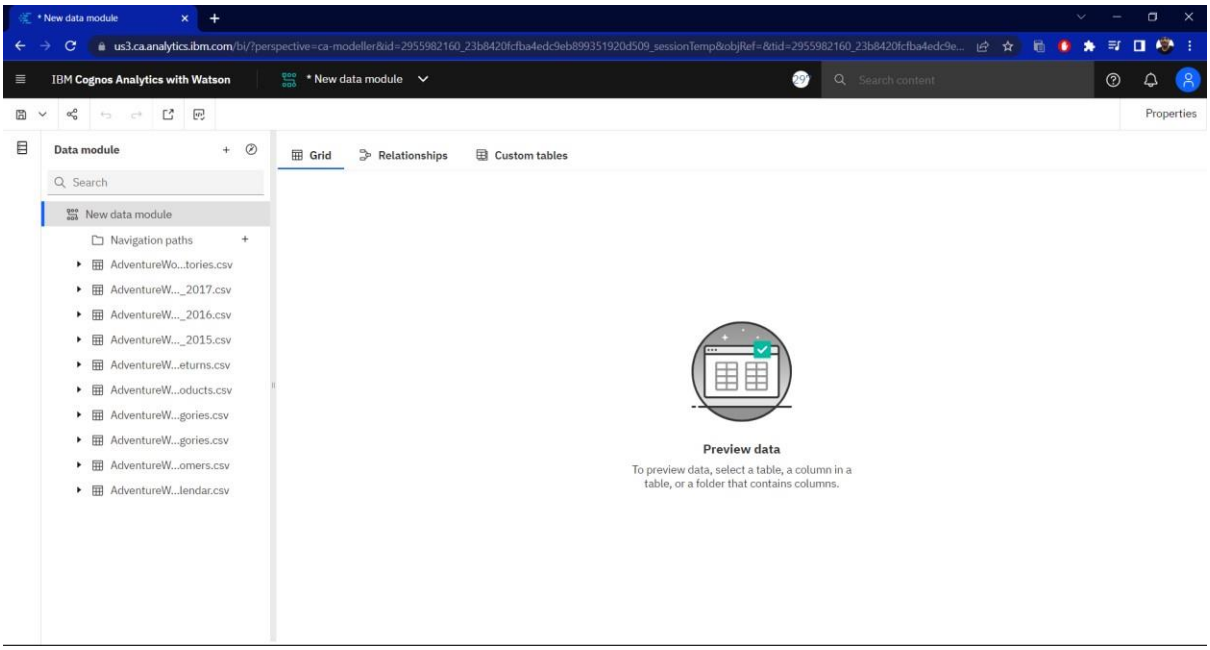


Fig: loading all dataset in the workbench

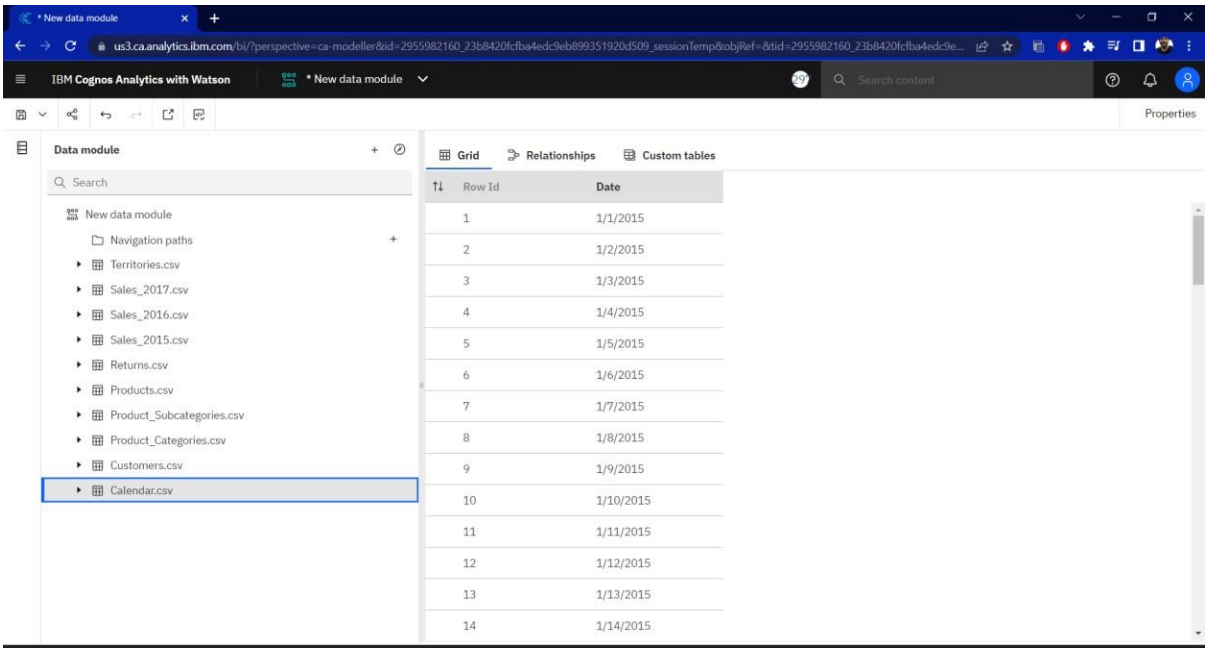


Fig: preparation of data by renaming all the datasets.

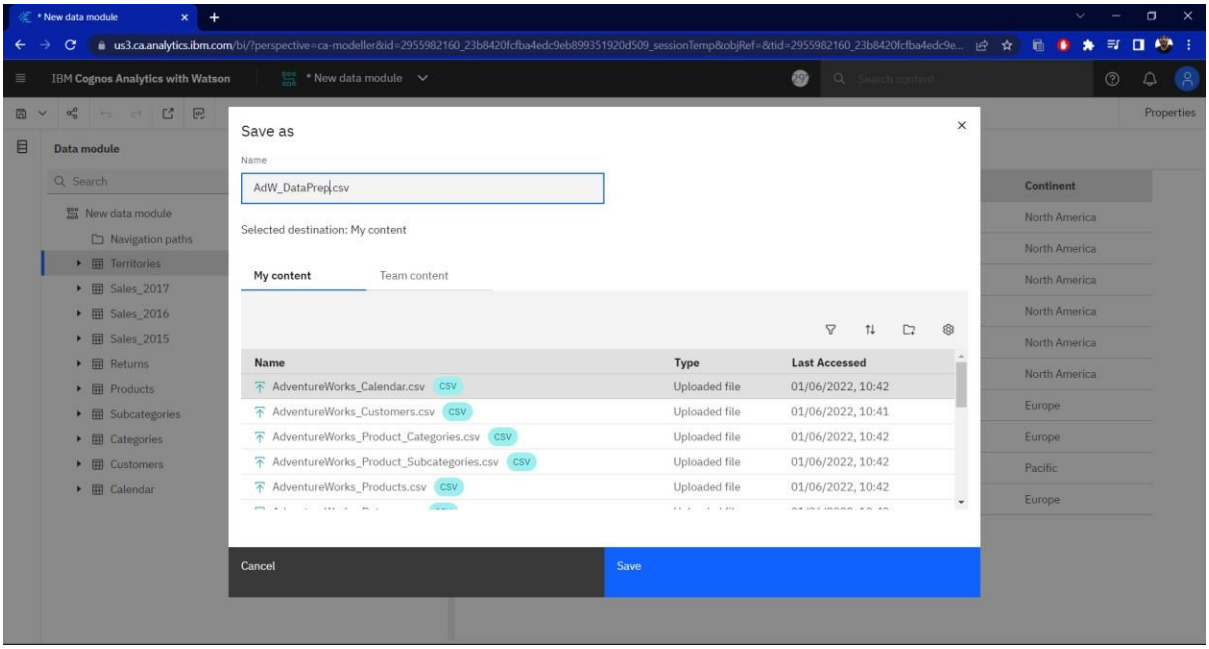


Fig: Saving the module after performing data preparation

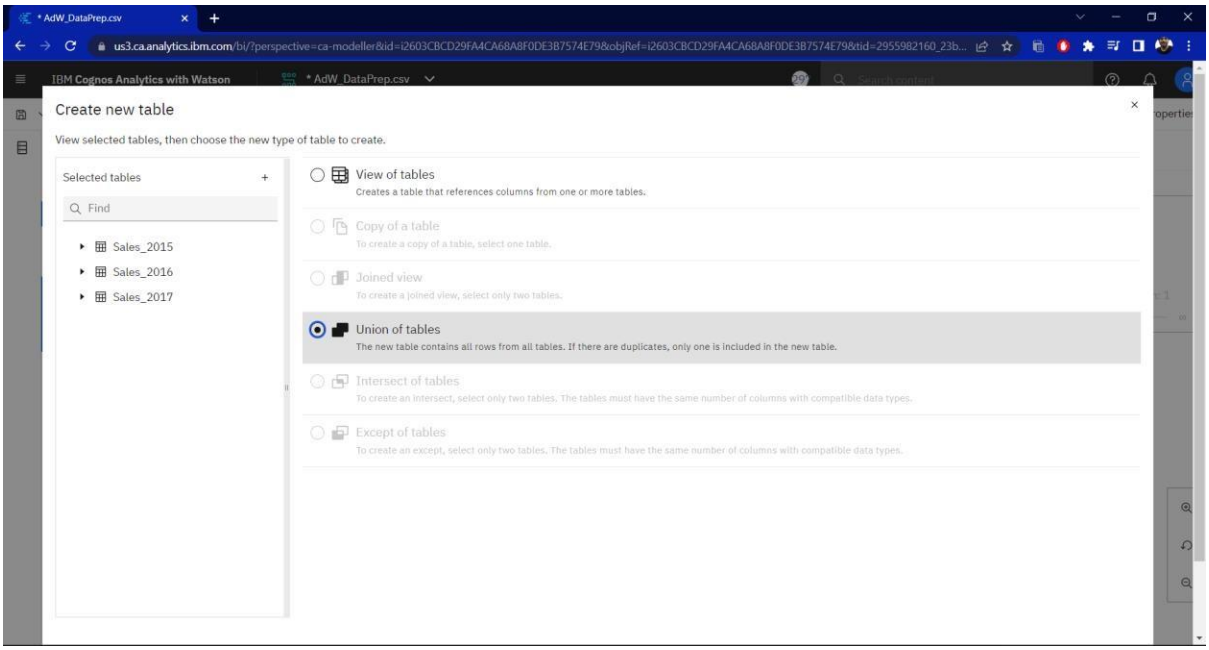


Fig: Create union of sales datasets

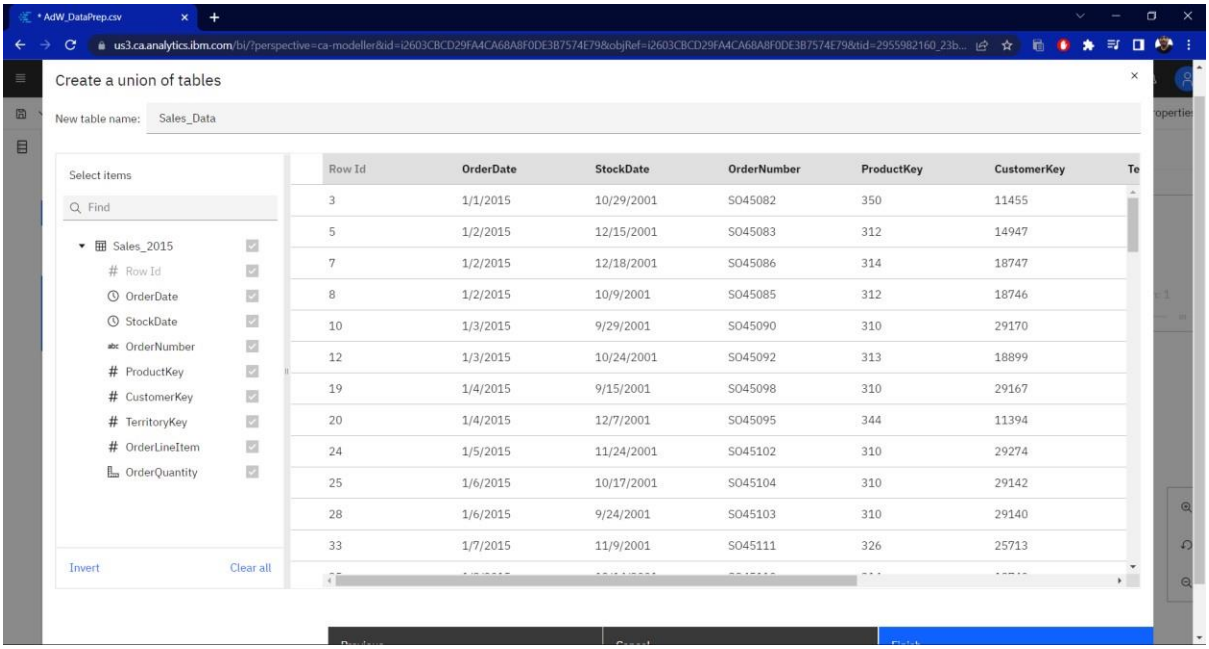


Fig: After performing union dataset on sales datasets

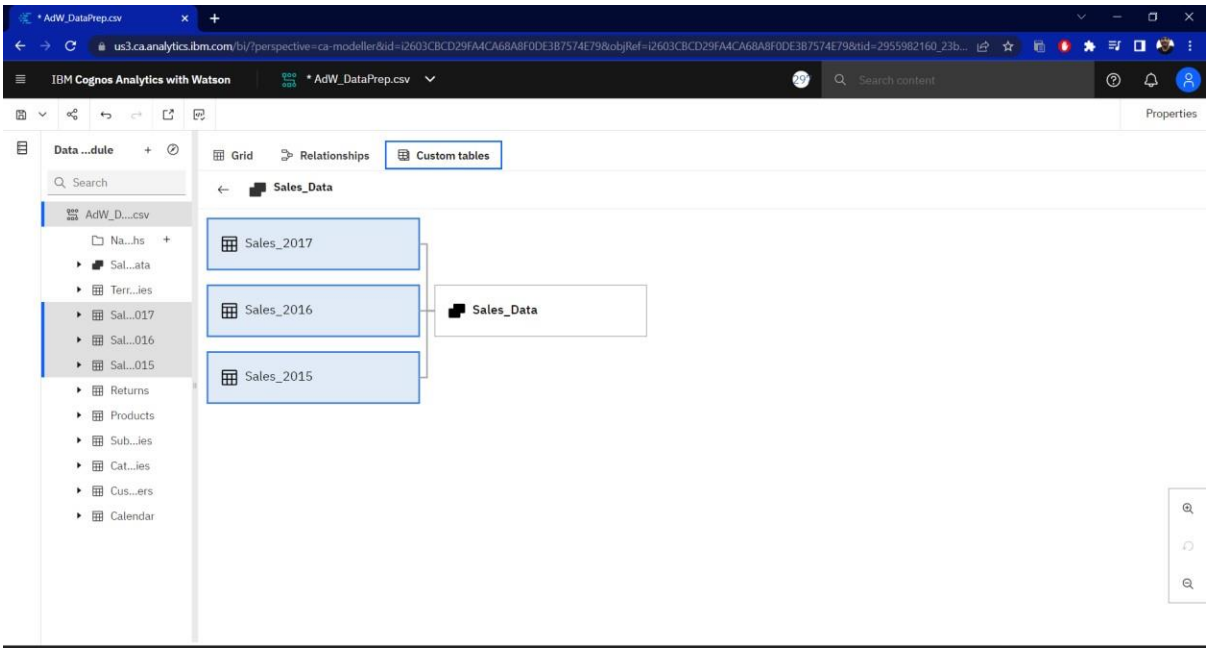


Fig: Union of sales dataset

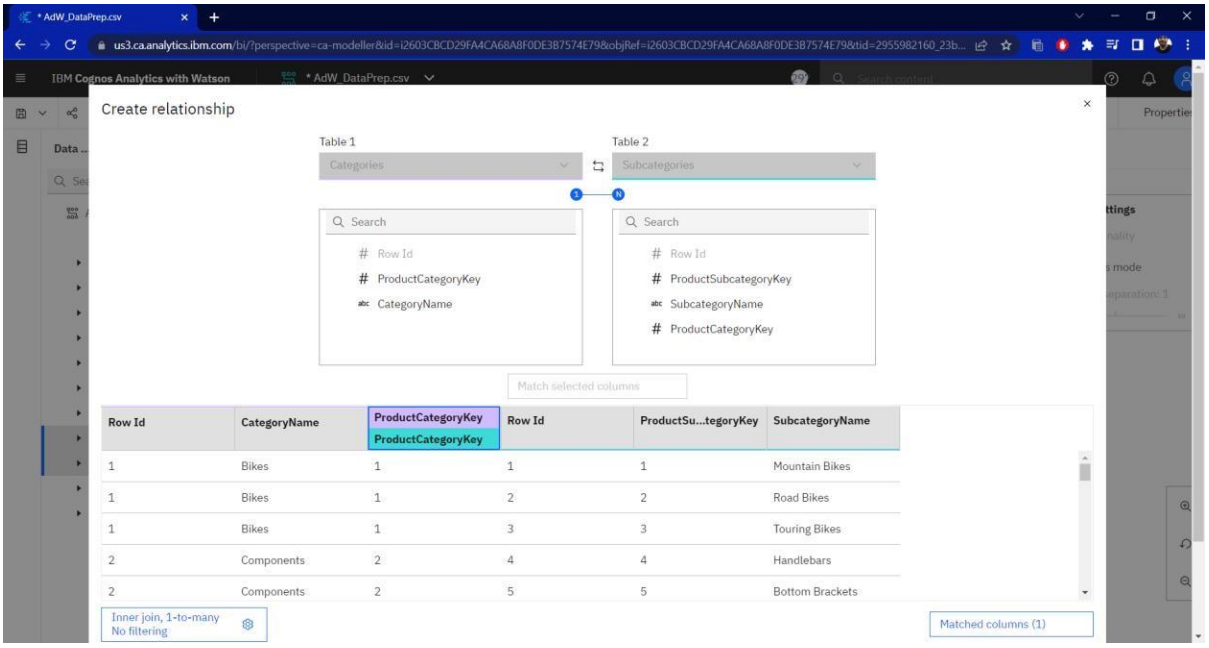


Fig: create relationship between categories and sub-categories and do a join operation.

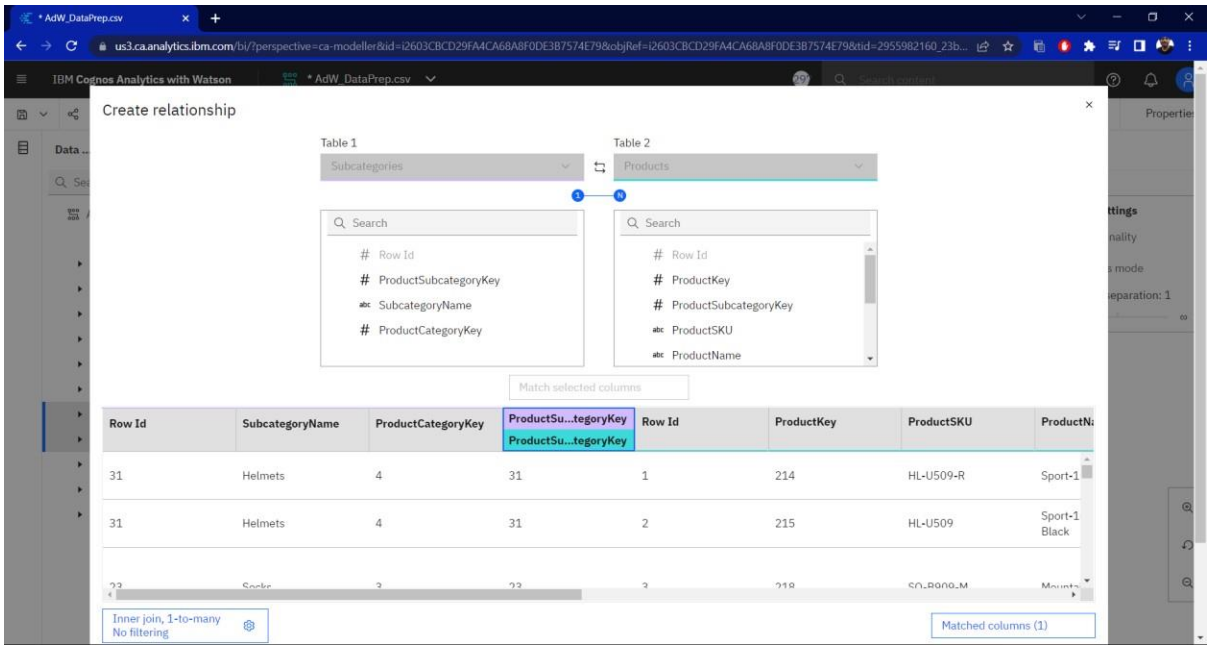


Fig: again, create relationship between subcategories and products and do join operation.

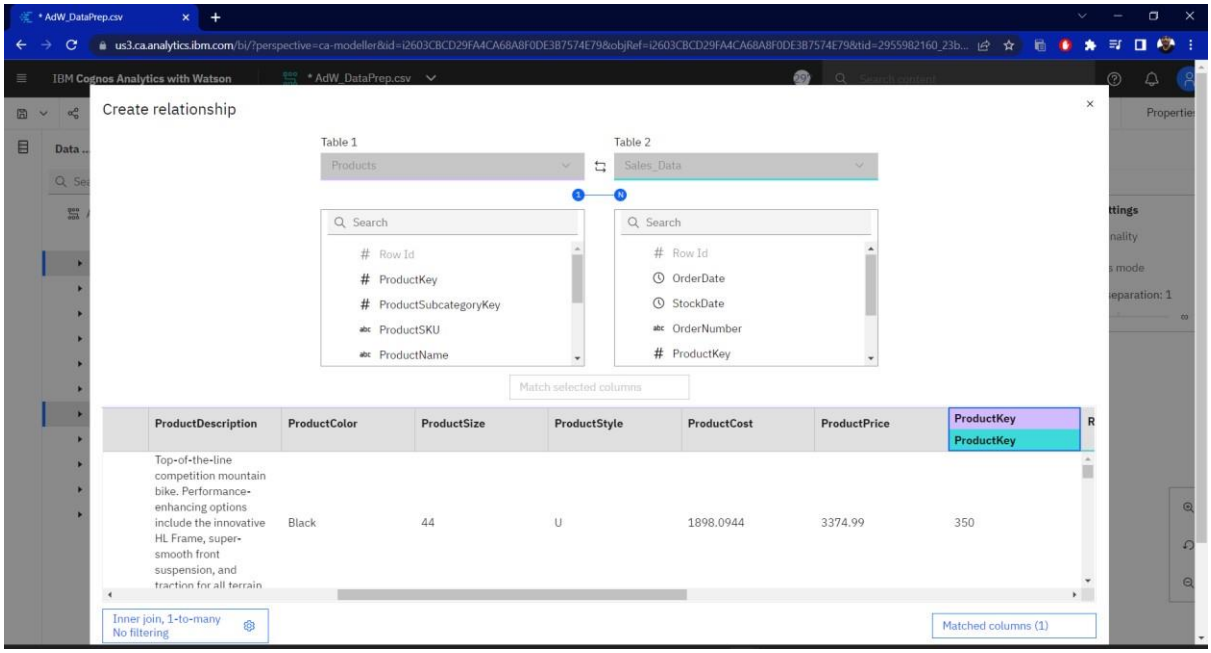


Fig: create relationship between products and sales_data and do join operation.

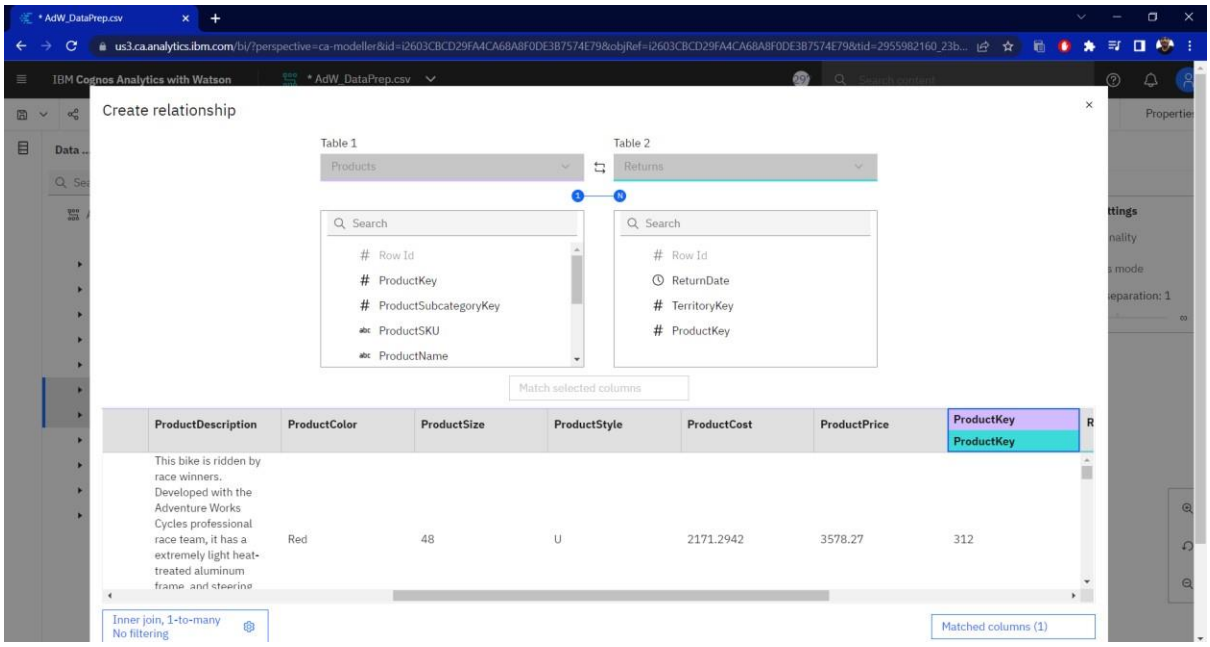


Fig: create relationship between products and returns and do join operations

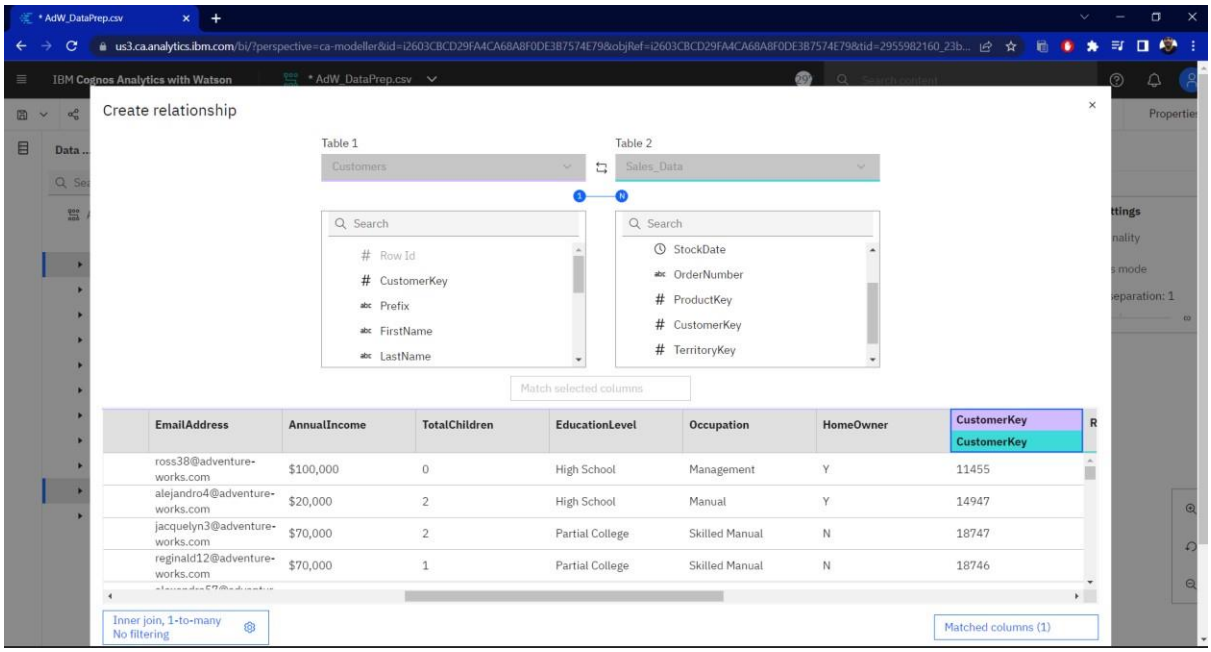


Fig: join operation between customers and sales_data

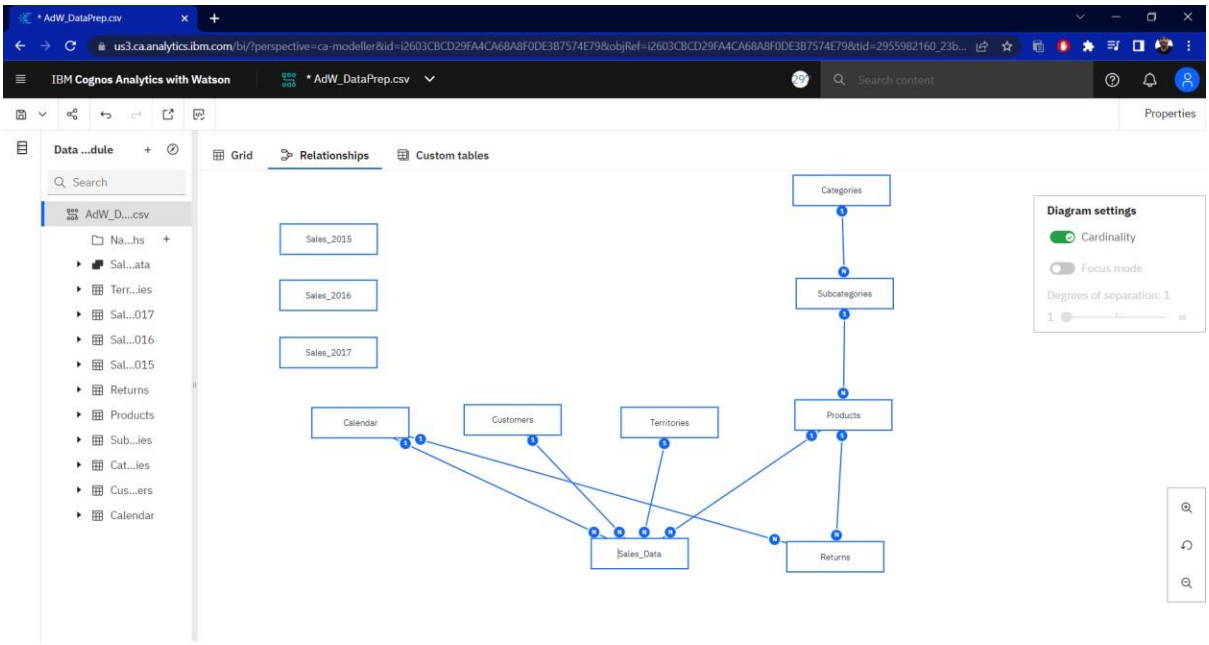


Fig: Relationship established after performing union and join operation

5. Data Preparations-Calculations

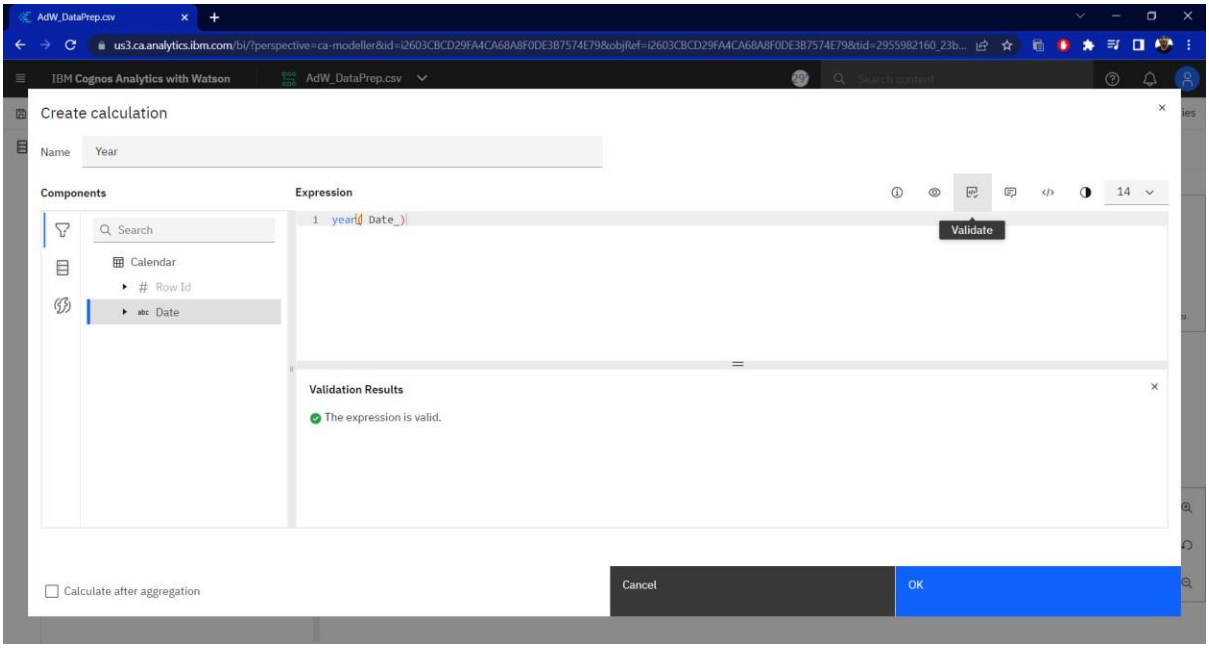


Fig: Performing Year calculation on calendar

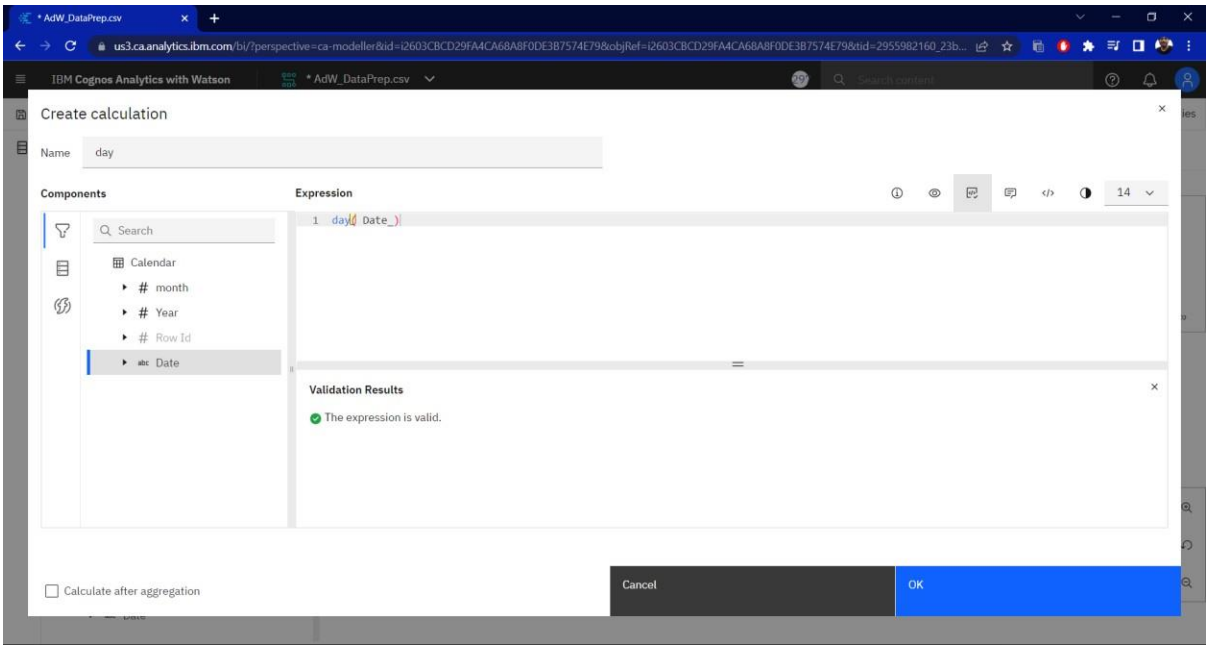


Fig: create calculation for month and date of calendar

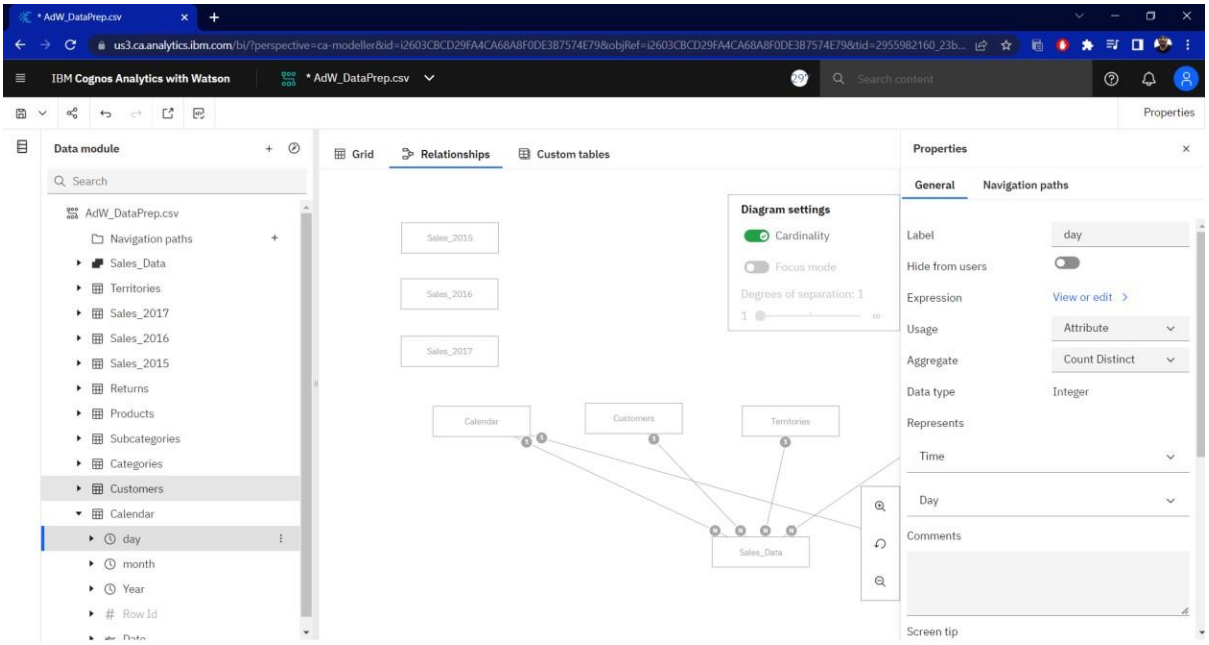


Fig: format the calculated data and update the properties

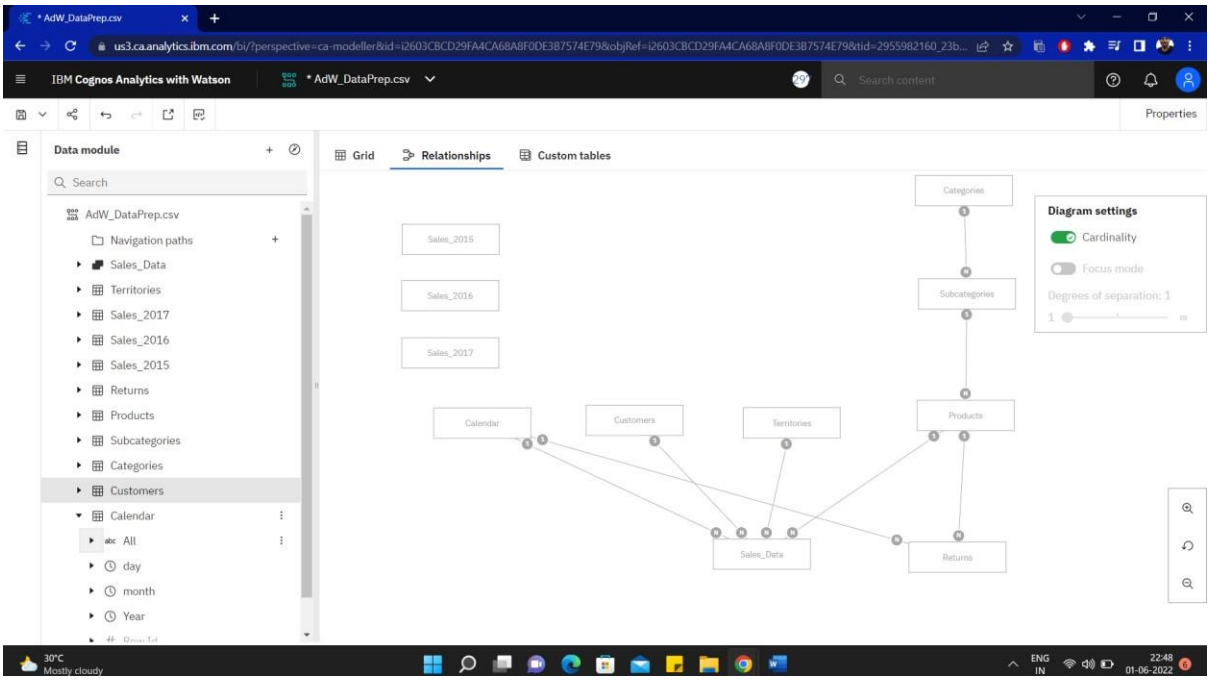


Fig: create calculation for all

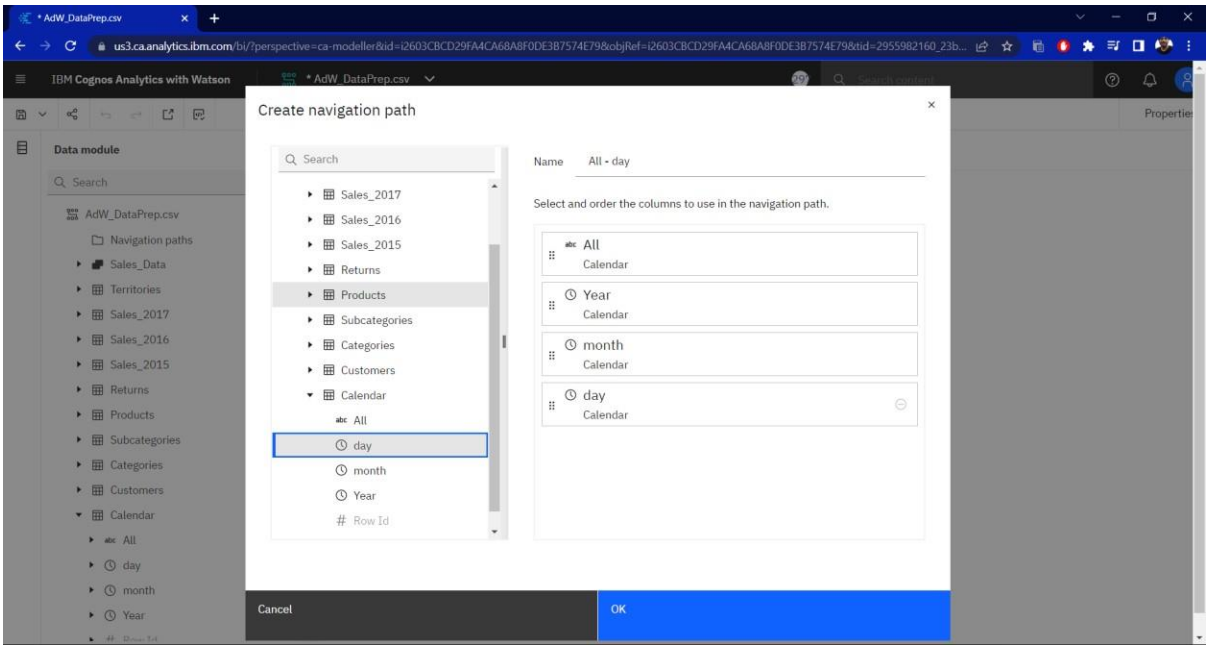


Fig: create navigation path for calendar data

6. Product wise Order Quantity, Return Quantity and Return Rate

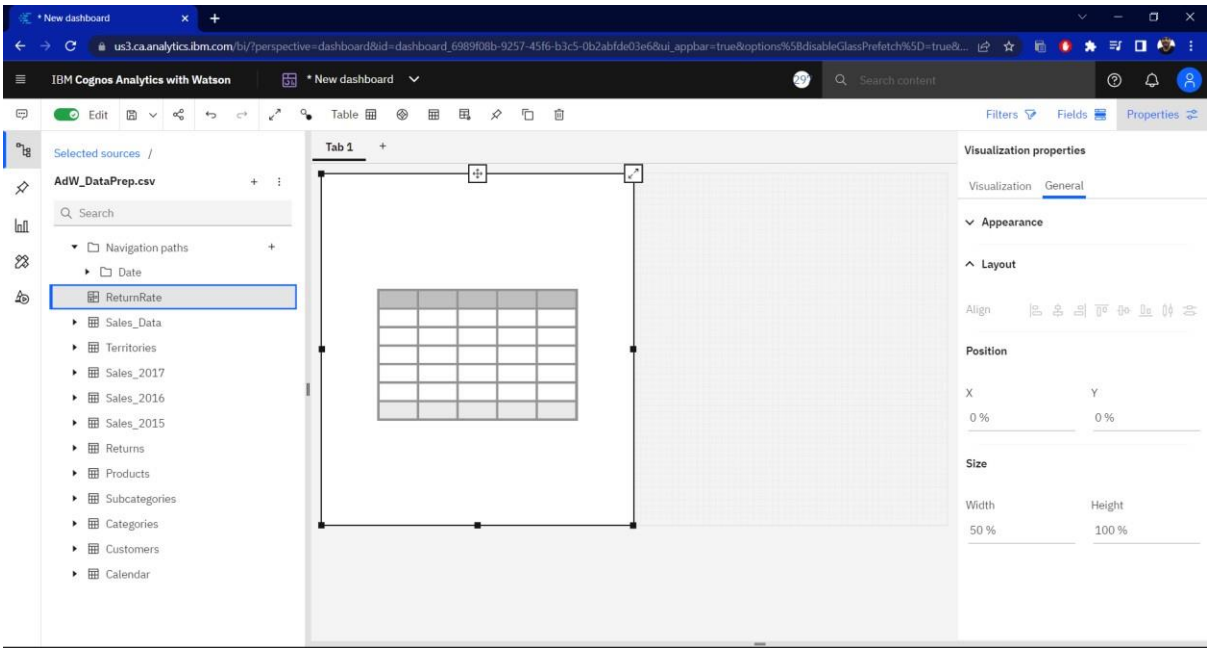


Fig: select a table visualization

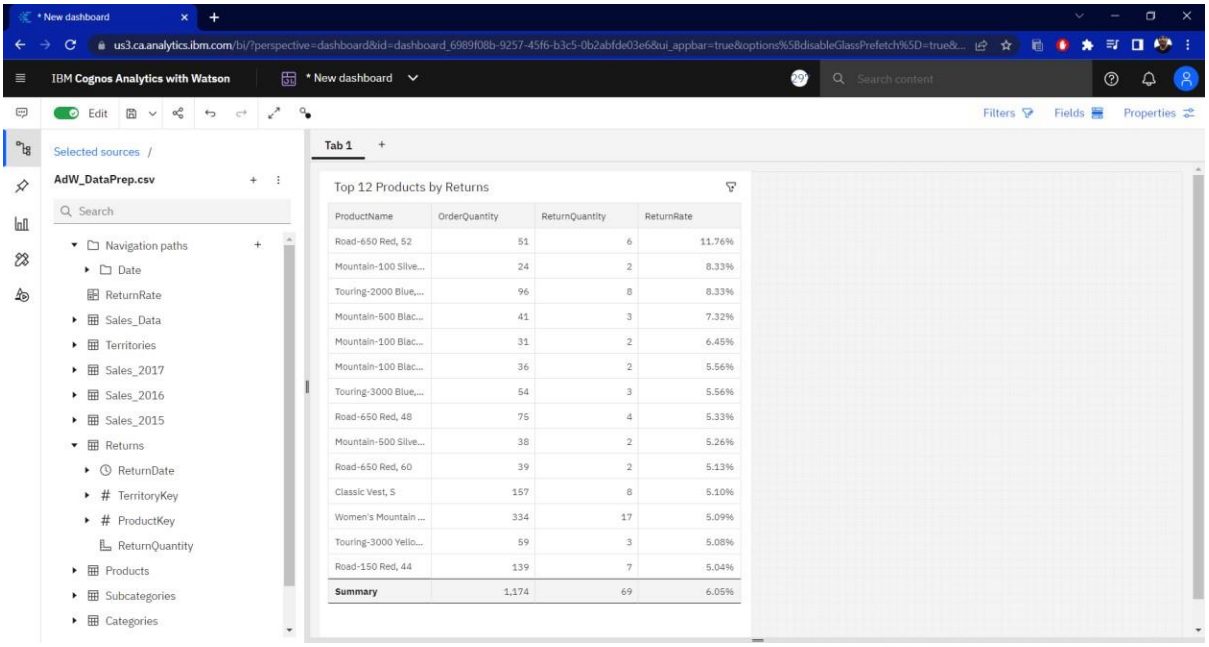


Fig: Top 12 products by Returns(productName,OrderQuantity,ReturnQuantity,ReturnRate)

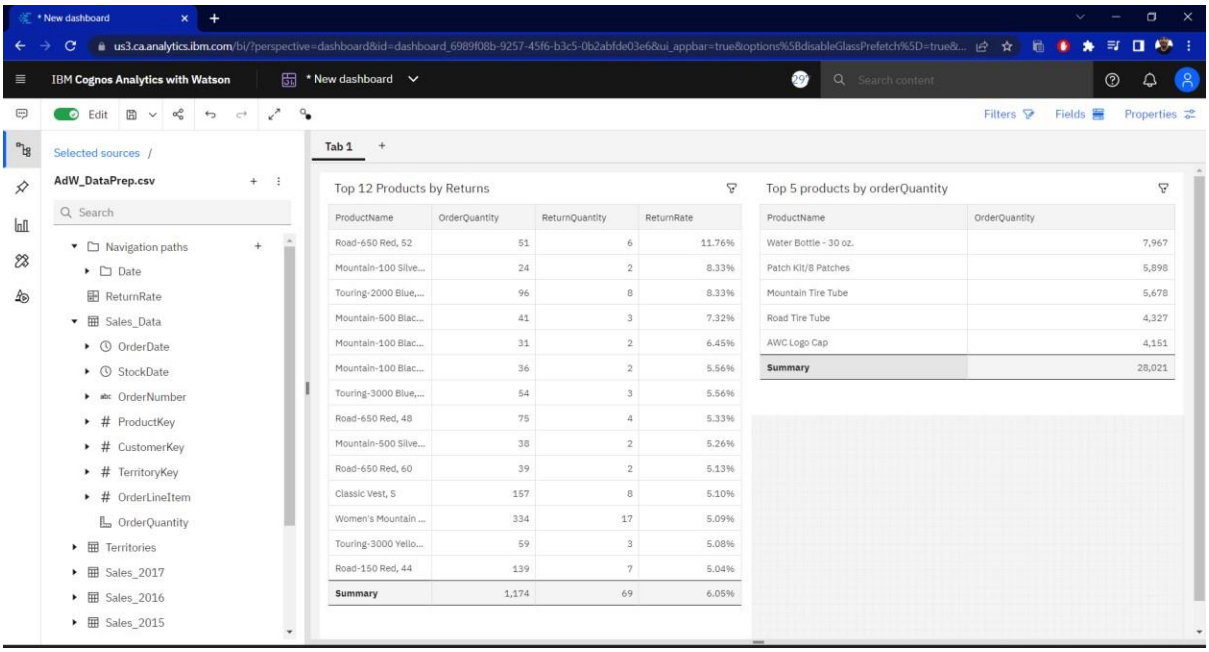


Fig: Top 5 product by OrderQuantity

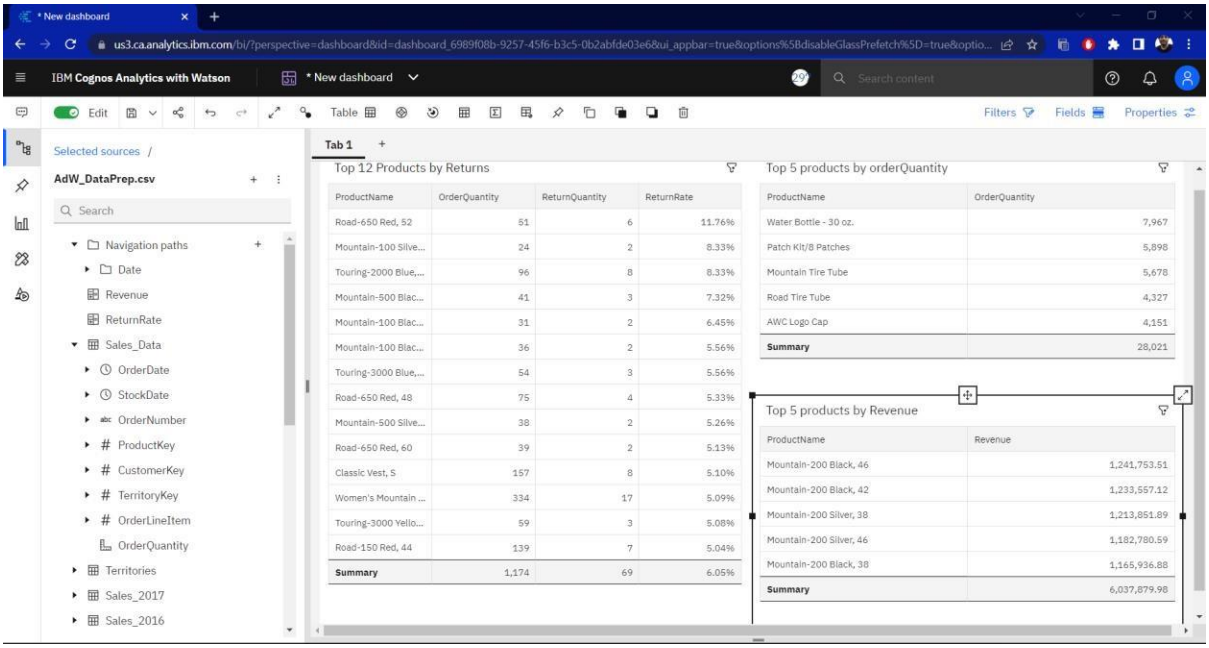


Fig: Top 5 products by revenue

7. Showing the Revenue by Education Level with Tree Map

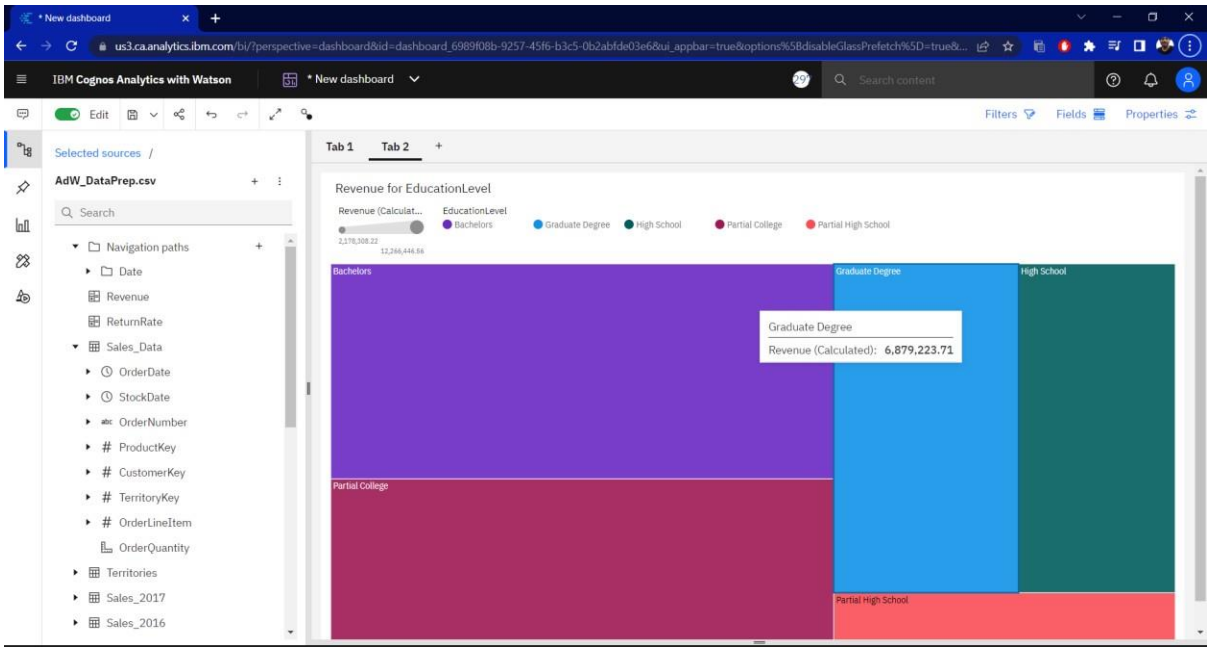


Fig: Revenue for EducationLevel

8. Country Wise Sales using Geographical map.

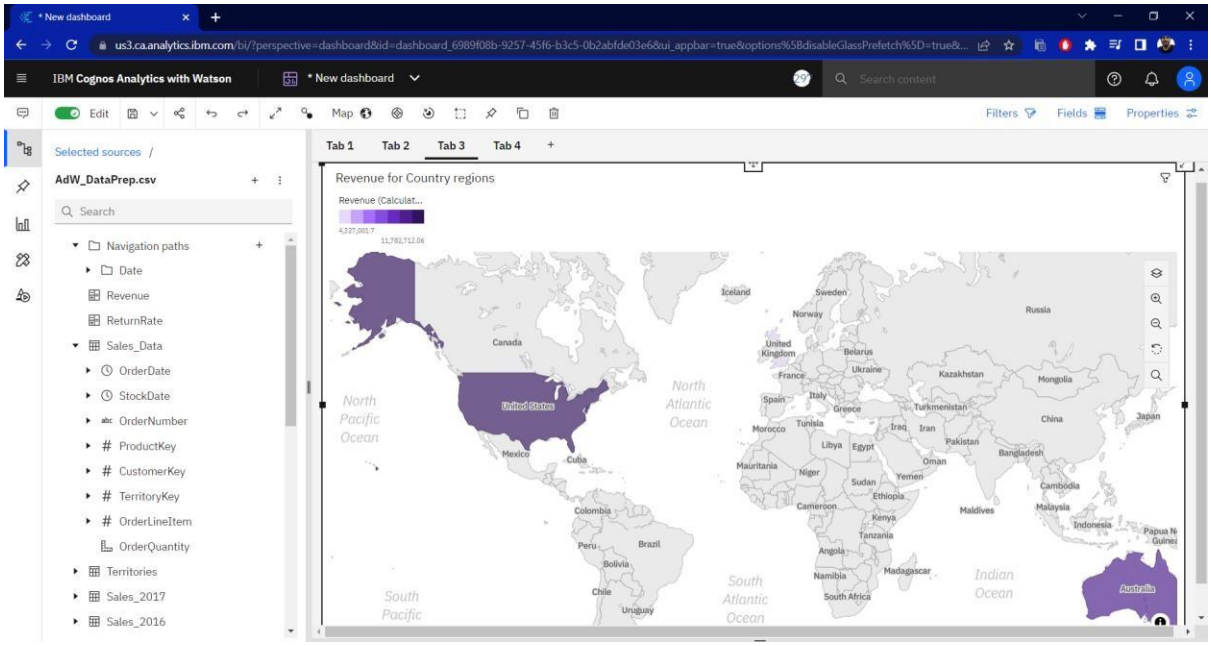


Fig: Revenue for Country Regions

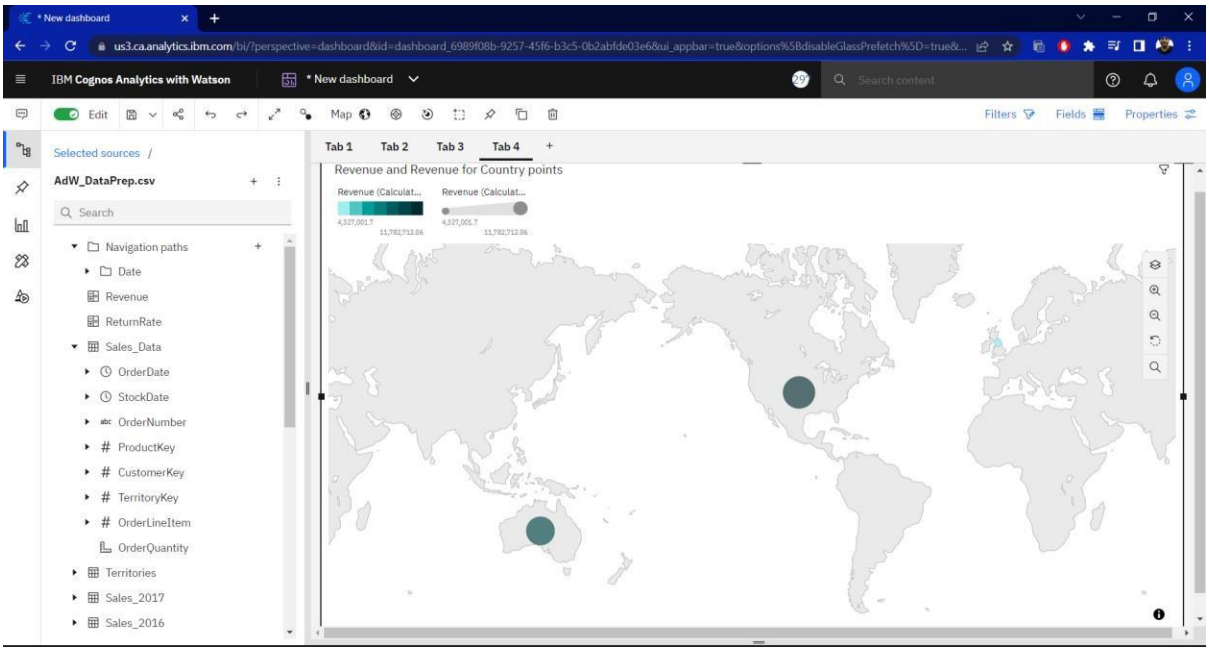


Fig: Revenue and Revenue for Country Points

9. Revenue by month using Pie Chart

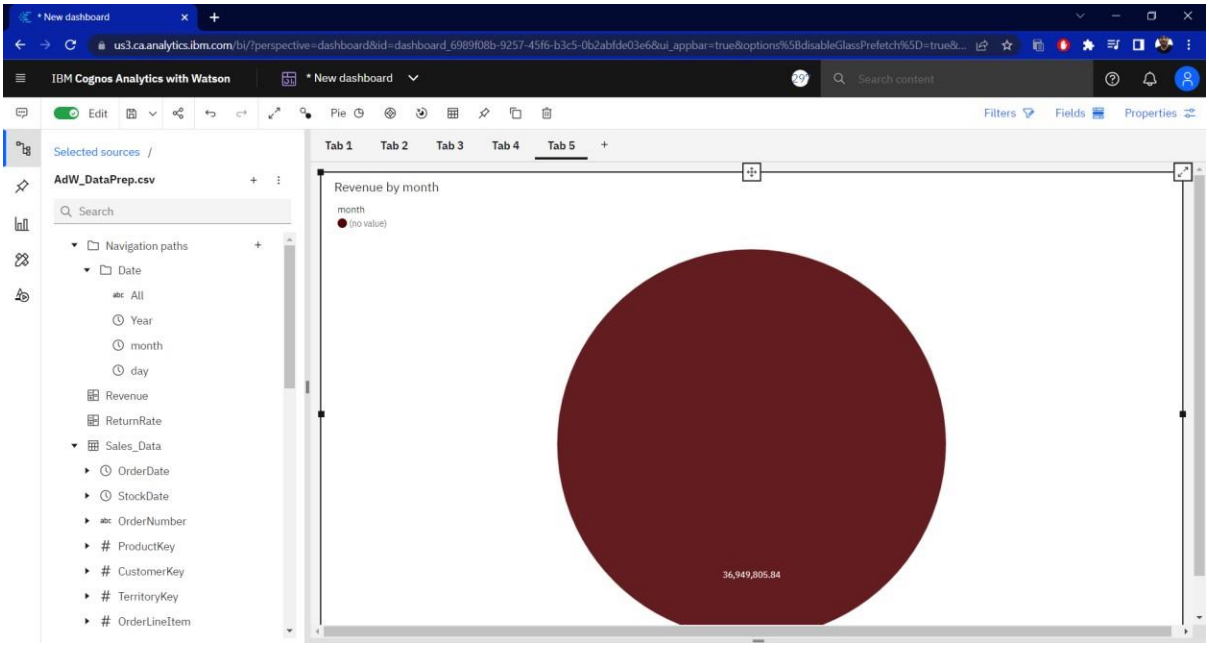


Fig: revenue by month

10. Summary of Revenue, Orders and Returns.

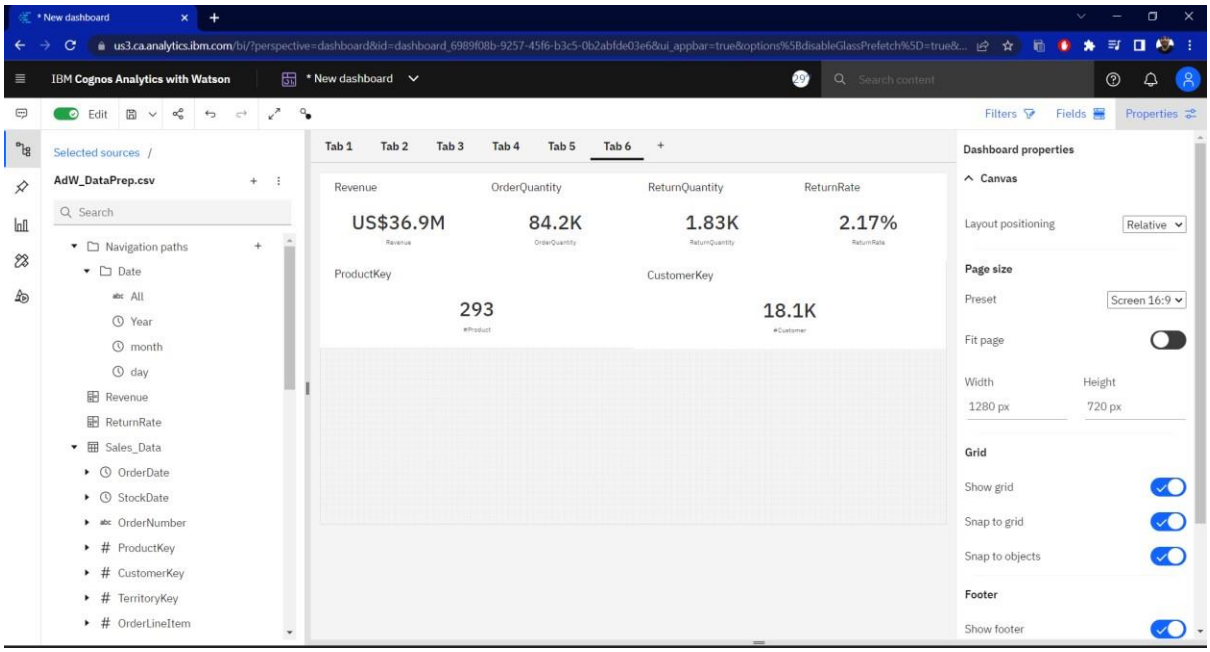


Fig: summary of Revenue order and returns

11. Monthly Forecast of Revenue

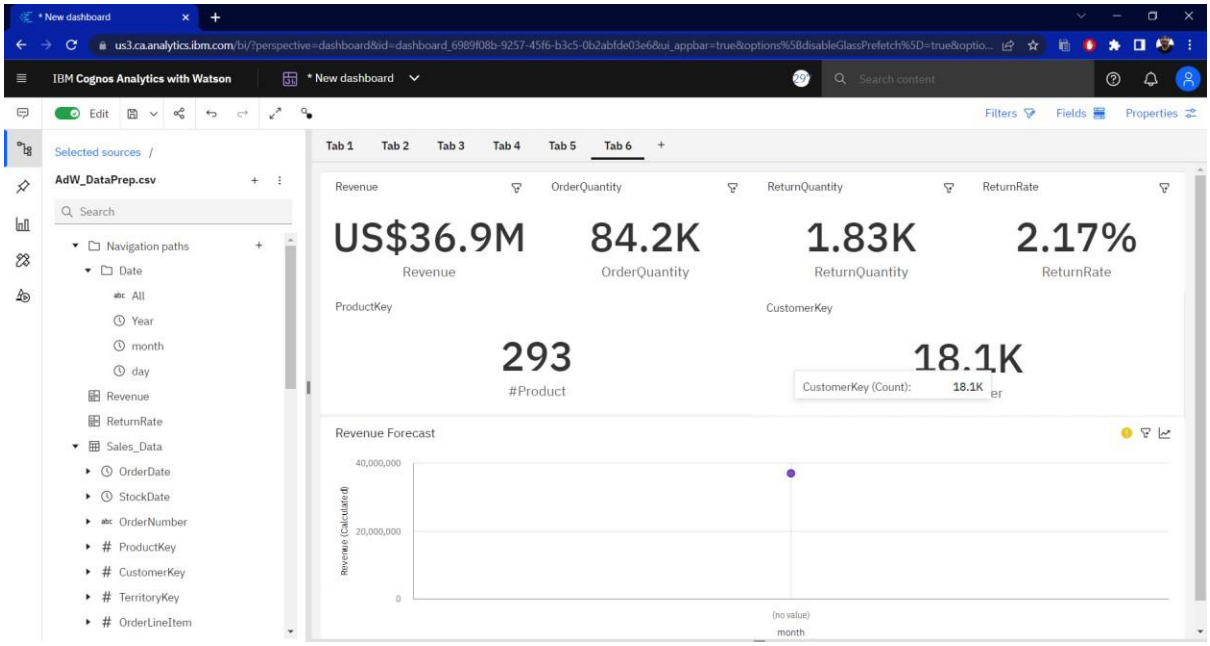


Fig: Revenue Forecast

Advantage and Disadvantage of creating Dashboard

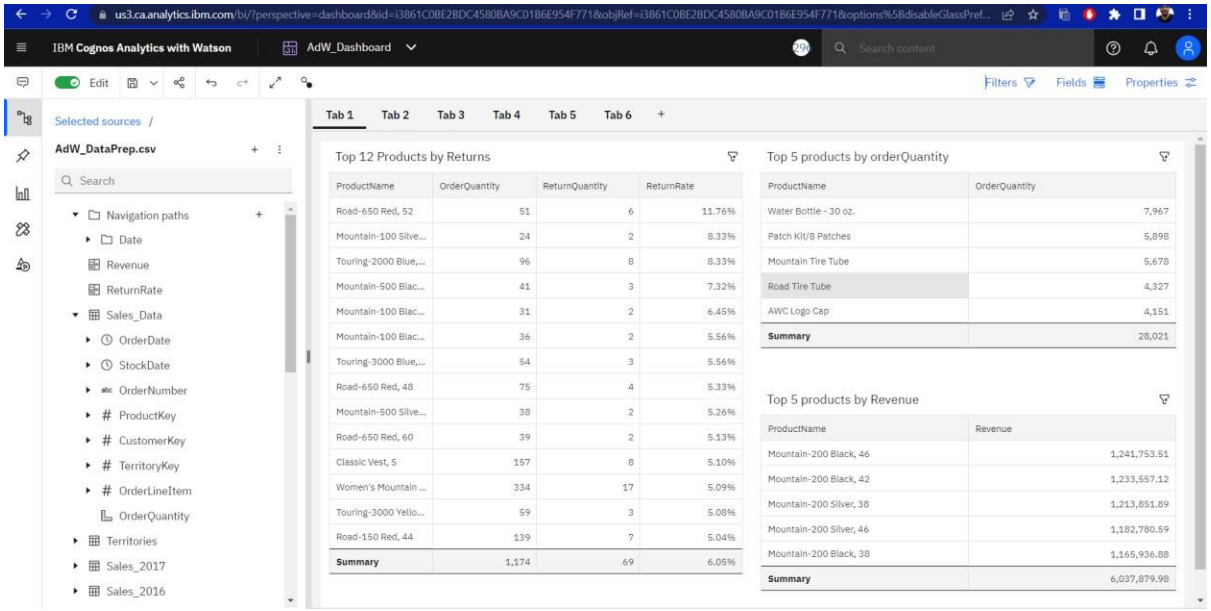
Advantage:

- Enhanced Visibility: Dashboards provide greater visibility with information available whenever it is required to ensure businesses are better placed to respond to changing market conditions.
- Timesaving Efficiency: With dashboards, we are no longer wasting valuable time generating reports from multiple systems. Instead, data is drawn from a source and displayed as an easy to interpret visual overview.
- Better Forecasting: With greater insight into the data, future demand can be more accurately predicted using historic information. Businesses can be more effectively planned for demand fluctuations, setting measurable goals and deliverables for greater success.
- Better Decision Making: Whether you're providing reporting and analysis for the entire organization or functional areas of the business, a dashboard allows companies to analyse key data quickly and meticulously. Visualized interactivity serves to deliver overwhelming amounts of data in a way that is easy to understand. With the ability to easily identify what the data really means; better decisions can be made relevant to the business.

Disadvantage:

- Flashy or cluttered design, with users attempting to incorporate too much information without understanding constraints or considering their specific needs from the range of different measurables detailed data analysis provides.
- The technology used in the development of dashboards differs from other software solutions already employed in organizations and can be initially difficult to understand.
- The business has no predetermined rules and hierarchies for how dashboard metrics are used. This means each employee can use the metrics in different ways, resulting in a diverse set of data being reported.

Dashboard



Conclusion

This way, with the help of diagrams, graphs, and maps we can understand given data. This understanding of data allows us to ask the right questions to reach our desired goals by optimizing methods. With this project, we learned how to upload and prepare data. We also statistical concepts which helped in calculations and plotting of graphs and maps to make a dashboard.