

Hands-On Lab: Generative AI for Data Visualization

Estimated time needed: 60 minutes

Overview

In this lab, you will learn how to use generative AI to generate various visuals from the dataset. You will use the [Akkio](#) and [Columns AI](#) platforms to create multiple charts and graphs automatically using simple steps.

Learning Objectives

After completing this lab, you will be able to:

- Sign in to [Akkio](#) and [Columns AI](#)
- Create visualizations
- Change the theme in the chart
- Generate various charts

Prerequisites

- Columns AI and Akkio account
- Basic understanding of exploratory data analysis (EDA)

Note: In Akkio and Columns AI, you can explore few features in the paid or trial version only.

About Akkio

Akkio empowers users to harness the power of AI to automate repetitive tasks, including data analysis and visualization. With Akkio's intuitive platform, users can streamline their workflows and generate insights from their data effortlessly.

Using Akkio AI-driven capabilities, users can interact with their data through natural language queries, generating visualizations and actionable insights with ease. By automating these processes, Akkio enables users to focus on strategic decision-making and innovation.

Note: Akkio free trial version is limited to a duration of 15 days

About Columns AI

With Columns AI Natural Language Visualization feature, you can generate charts using descriptions written in plain language. This simplifies and enhances accessibility to data visualization.

Utilizing a natural language interface, users can inquire about their data receive textual summaries, code snippets, or visual charts as outputs. Leveraging advanced AI models, Columns AI interprets user queries to discern intent and deliver appropriate responses.

Note: While signing up for Columns AI to access the free 7-day trial, users are required to provide their bank account details. After the trial period, charges will apply. It is optional to proceed with this Columns AI exercise, and learners can decide if they wish to continue with the sign-up process.

Dataset

In this lab, you will work with two datasets: the Retail Sales Data dataset available on the Akkio platform and the Student Alcohol Consumption dataset [vtex-retail-csv](#) by UCI Machine Learning, which can be obtained from [Kaggle](#) for Columns AI.

The Retail Sales Data dataset contains information on retail sales, including various attributes such as Store ID, Employee Number, Area, Date, Sales, Marketing Spend, Electronics Sales, Home Sales, and Clothes Sales. This dataset appears to represent retail sales data, possibly from multiple stores in the same geographic area, over a period of time. Each entry in the dataset corresponds to a single sales transaction, including information about the store, employee, sales amount, and product categories.

Field	Description
Store ID	Identifier for the store where the sales were made.
Employee Number	Identifier for the employee involved in the sales transaction.
Area	Geographic area where the store is located.
Date	Date of the sales transaction.
Sales	Total sales amount for the transaction.
Marketing Spend	Amount spent on marketing activities for the transaction.
Electronics Sales	Sales amount specifically related to electronics products.
Home Sales	Sales amount specifically related to home products.
Clothes Sales	Sales amount specifically related to clothing products

The Student Alcohol Consumption dataset is based on data collected from two secondary schools in Portugal, with students enrolled in mathematics and Portuguese courses. The dataset we are using is for the mathematics course. The number of mathematics students involved in the collection was 395. The data collected in locations such as Gabriel Pereira and Moutinho da Silveira includes several pertinence values. Examples of such data are records of demographic information, grades, and alcohol consumption.

Field	Description
school	GPMES for the student's school
sex	M/F for gender
age	13-20 for the student's age
address	UR for urban or rural, respectively
fnsize	L3GCT for less than or greater than three family members
fam居住	T/A for living together or apart from parents, respectively
Medu	0 (none) / 1 (primary-4th grade) / 2 (5th - 9th grade) / 3 (secondary) / 4 (higher) for mother's education
Pedu	0 (none) / 1 (primary-4th grade) / 2 (5th - 9th grade) / 3 (secondary) / 4 (higher) for father's education
Mjob	teacher, "health care related, civil services," "at home" or "other" for the student's mother's job
Fjob	teacher, "health care related, civil services," "at home" or "other" for the student's father's job
reason	close to "home," school reputation, "course preference, or "other" for the choice of school
guardian	mother/father/other as the student's guardian
traveltime	1 (≤15mins) / 2 (15 - 30 mins) / 3 (30 mins - 1 h) / 4 (1-1hr) for a time from home to school
studytime	1 (Chz) / 2 (1-Shz) / 3 (10hrs) / 4 (10hrs) for weekly study time
failures	1-3 for the number of class failures (if more than three, then record 4)
schoolsup	yes/no for extra educational support
famsup	yes/no for family educational support
paid	yes/no for extra paid classes for Math or Portuguese
activities	yes/no for extra-curricular activities
nursery	yes/no for whether attended nursery school
higher	yes/no for the desire to continue studies
internet	yes/no for internet access at home
romantic	yes/no for relationship status
famrel	1-5 scale on quality of family relationships
freetime	1-5 scale on how much free time after school
goout	1-5 scale on how much student goes out with friends
Dalc	1-5 scale on how much alcohol consumed on weekdays
Walc	1-5 scale on how much alcohol consumed on the weekend
health	1-5 scale on health condition
absences	0-95 number of absences from school
G1	0-20 for the first-period grade
G2	0-20 for the second-period grade
G3	0-20 for the final grade

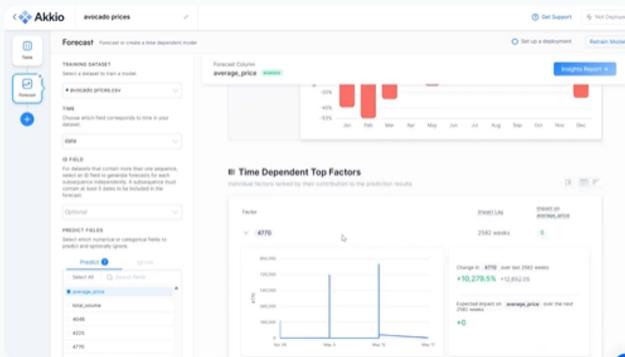
Task 1: Sign up and create an account on Akkio.

1. Sign up for Akkio.
2. Open the link [Akkio](#) and then click the "Try for free" button at the top right corner.

1. You will see the 'Sign up' page. You may continue with an existing Google account or create a new one.

Akkio Generative BI for Agencies

Akkio lets you add AI-powered analytics and predictive modeling to your service offering, so your customers can chat with their data, create live charts and graphs, and predict future trends – just by asking. Sign up now for a free trial and see how AI can elevate your agency and drive new revenue.


[Watch Demo](#)
[Schedule a Call →](#)

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[Free Trial](#)

No credit card required


[Sign Up With Google](#)

or

 First Name

 Last Name

 Email

 Password

 Re-enter Password

I would like to receive emails about new product updates and other news.

[Start Free Trial](#)

By signing up you agree to our [Terms](#) and [Privacy Policy](#).

Already have an account? Log In



How are you planning to use Akkio?

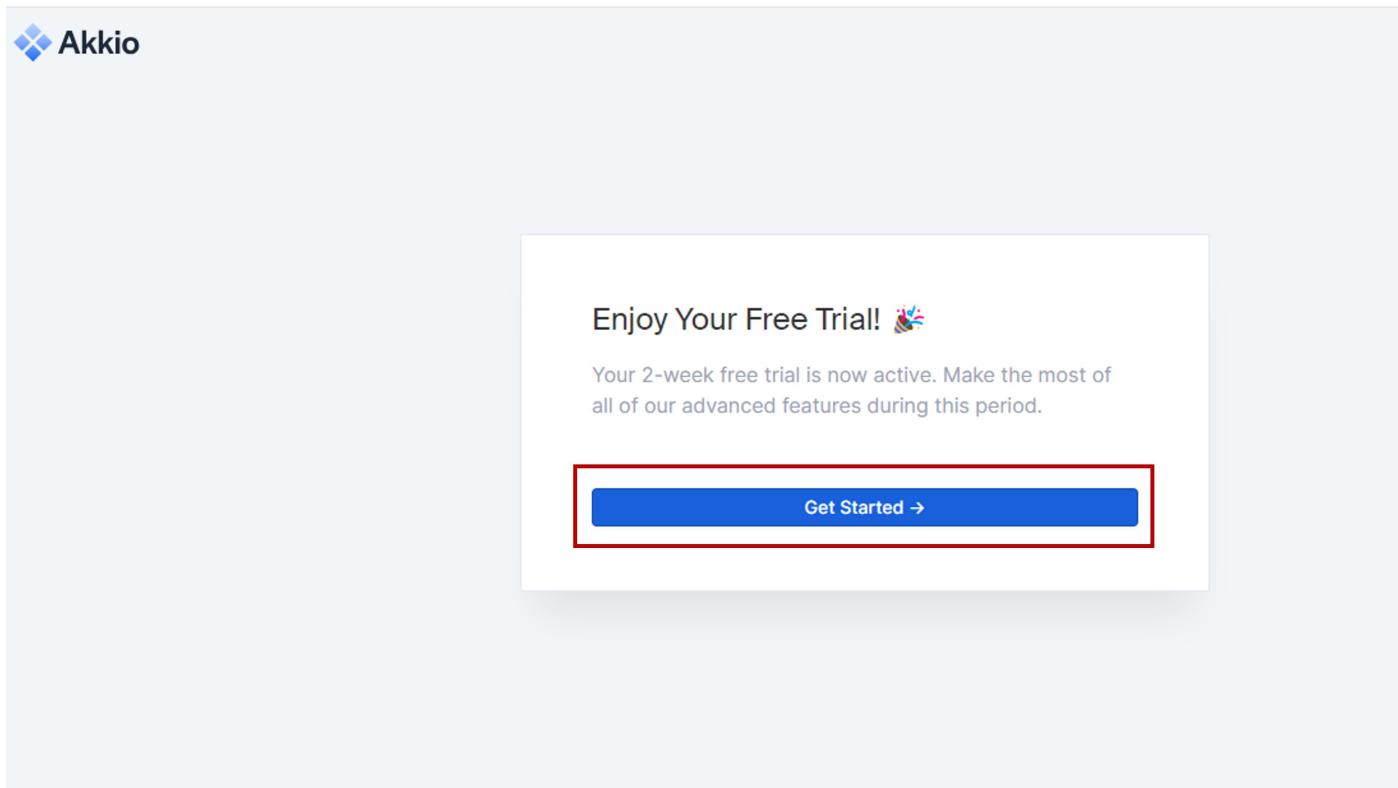
This will help us optimize your onboarding experience

With my downstream customers
(build on top with API or Whitelabel)

Internally to my company

For personal use / as a student

[Continue →](#)



5. The Launching page will occur; you have to select the 'Home' button from the left top corner. It will launch on the home page.

Lead Scoring Demo

tech company lead scoring.csv 10,000 rows, 13 columns No transforms applied

Chat Data Prep Clean Merge

Job Title	Years of Experience	Company Size	Industry	Location	Website Visits	Resource
Assistant	20.6%	Small	Finance	Urban	33.9%	0
Director	20.3%	Large	Retail	Rural	33.3%	1
Other	59.1%	Medium	Other	Suburban	32.8%	0
1 Assistant	23	Large	IT	Suburban	11	1
2 Manager	23	Large	Finance	Rural	24	0
3 Manager	24	Large	Finance	Rural	13	0
4 Executive	3	Large	Healthcare	Rural	13	0
5 Director	29	Large	IT	Suburban	14	0
6 Consultant	27	Medium	Manufacturing	Suburban	27	0
7 Executive	28	Small	Manufacturing	Suburban	7	0
8 Assistant	9	Large	IT	Suburban	13	0

Task 1.1: Connecting to the dataset

1. From the home page, click 'Create New Project' to create a new project from the existing dataset, the **retail sales data** dataset, one of the sample datasets provided by Akkio.

Akkio

S Sathya's Team 7

Projects 7

Development Production Archive

Create New Project

Job Title Years of Ex... Department Salary Range

Assistant	25	Sales	High
Consultant	29	Customer S...	Medium
Executive	6	Sales	High
Consultant	3	Marketing	Medium

Not deployed ...

Employee Attrition Demo 14 minutes ago

Sentiment Model 14 minutes ago

Job Title Years of Ex... Company S... Industry

Assistant	23	Large	IT
Manager	23	Large	Finance
Manager	24	Large	Finance
Executive	3	Large	Healthcare

Not deployed ...

customerID gender SeniorCitizen Partner

7590-VHVE...	Female	0	Yes
5575-GNV...	Male	0	No
3668-QPY...	Male	0	No
7795-CFO...	Male	0	No

Not deployed ...

Transaction... Trans

7271	US
861	US
5391	US
5192	US

Not deployed ...

From the Prepare tab, select the 'Upload File' option, which will redirect to the page to choose the dataset. Select the Retail sales data.csv dataset.

Sathya Priya Trial

Sathya's Project (1) Prepare Explore Predict Deployments Reports

Pick a data source to start

Upload File CSV EXCEL JSON

Google Ads Beta Not Connected

Google Sheets Not Connected

Google BigQuery Not Connected

Google BigQuery Service Account (import only) Not Connected

Snowflake Not Connected

Sathy's Project (1) / Prepare Explore Predict Deployments Reports

[Back](#)

Select a dataset

Search for datasets...

Upload Dataset

Job Title	Years of Exp...	Department	Salary Range
Assistant	25	Sales	High
Consultant	29	Customer S...	Medium
Executive	6	Sales	High
Consultant	3	Marketing	Medium

employee_attrition_demo_data.... Today at 11:40 AM

Sentiment	Text
Negative	@switchfoot http://twitpic.co...
Negative	is upset that he can't update ...
Negative	@Kenichan I dived many time...
Negative	my whole body feels itchy an...

Sentiment Data.csv Today at 11:40 AM

customerID
7590-VHVEG
5575-GNVDE
3668-QPYBK
7795-CFOC...

Telco-Custo

Transaction ...	Transaction ...	Transaction ...	Transaction ...
7271	US	AUD	1
861	US	AUD	8
5391	US	CAD	12
5192	US	USD	5

Credit_Card_Fraud.csv Today at 11:40 AM

Review Text	Review
Wow... Loved this place.	Positive
Crust is not good.	Negative
Not tasty and the texture was...	Negative
Stopped by during the late M...	Positive

Restaurant_Reviews.csv Today at 11:40 AM

Store ID	Employee N...	Area	Date
1	54	Asia	2018-01-31
1	57	Asia	2018-02-28
1	50	Asia	2018-03-31
1	56	Asia	2018-04-30

retail sales data.csv Today at 11:40 AM

Task 1.2: Generating visuals using Akkio

The selected dataset will appear on the page. Select the 'Explore' tab to get an exploratory insight into the relationship between marketing spend and sales by generating a scatter plot. To do so, type 'Make a scatter plot of Marketing spend vs. sales' in the 'Ask a question about your data' prompt and click the 'Execute' icon.

retail sales data.csv 3,000 rows, 9 columns

Explore

Chat Data Prep Clean Merge

Store ID	Employee Number	Area	Date	Sales	Marketing Spend	Electronics Sales	Hon
1	54	Asia	2018-01-31	86586.23	16022.68	23312.79	1099
2	57	Asia	2018-02-28	131181.61	6562.93	38738.19	1700
3	50	Asia	2018-03-31	185833.69	1106.61	53601.54	2699
4	56	Asia	2018-04-30	150538.66	16586.79	42062.01	2581
5	50	Asia	2018-05-31	183421.04	2708.69	42276.04	2670
6	56	Asia	2018-06-30	292656.36	10459.98	69192.41	4589
7	52	Asia	2018-07-31	214964.98	26320.18	48065.41	2404
8	56	Asia	2018-08-31	189526.91	26479.09	47851.76	2755
9	55	Asia	2018-09-30	222308.26	4848.86	64556.77	3840
10	58	Asia	2018-10-31	213762.78	13452.72	43525.38	2118

retail sales data | Prepare | Explore | Predict | Deployments | Reports | Connect Slack Account (Beta)

No chat history

There are no saved chats in this project. Start one by asking a question.

Chat Explore

Explore your data

↳ What is the average sales by area?

↳ Show me a scatterplot of sales vs. marketing spend

↳ Make a histogram of employee numbers

↳ What is the total sales by date?

For best results, ask one question at a time. Start a new chat when you switch topics.

Make a scatter plot of Marketing spend vs sales

2. The scatter plot will be generated. You can get the details on the approach used to create this chart by clicking the Show Approach.

retail sales data | Prepare | Explore | Predict | Deployments | Reports | Connect Slack Account (Beta)

+ New Chat

Today

Make a scatter plat of M...

Marketing Spend vs Sales

Relationship between marketing spend and sales, with marketing spend on the x-axis and sales on the y-axis.

Sales

Marketing Spend

Show Approach

Show Table

Regenerate response

Ask a question about your data...

retail sales data

Prepare Explore Predict Deployments Reports Connect Slack Account (B)

+ New Chat Today Make a scatter plot of M...

Marketing Spend

This chart, titled "Marketing Spend vs Sales", was generated using a Python library called Plotly Express. The code takes a DataFrame, which is a table of data, and uses the scatter plot function from Plotly Express to create a scatter plot chart. In this chart, the x-axis represents the amount of money spent on marketing, and the y-axis represents the sales generated. Each point on the chart represents a combination of marketing spend and sales for a specific data point. To create the chart, the code specifies the DataFrame and the columns to use for the x-axis and y-axis. It also sets the title of the chart and labels for the x-axis and y-axis. The scatter plot function then calculates the position of each point on the chart based on the values in the DataFrame. It also adds the title and labels to the chart. The resulting chart shows the relationship between marketing spend and sales. By looking at the chart, you can see if there is a correlation between the two variables. For example, if the points on the chart are mostly clustered in the upper right corner, it suggests that higher marketing spend is associated with higher sales.

Example SQL

```
SELECT `Marketing Spend`, `Sales`  
FROM YOUR_DATASET;
```

Ask a question about your data... ➤

To generate a bar chart that shows the average sales by area, type 'Create a bar chart that shows the average sales by area' in the Ask a question about your data prompt and click 'Execute' icon. You can also download the charts by clicking the 'Download' button.

retail sales data

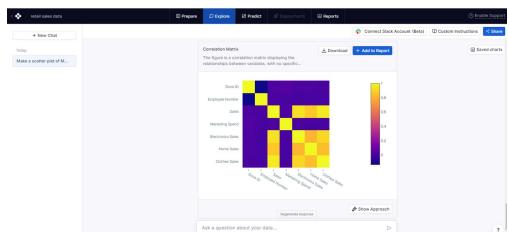
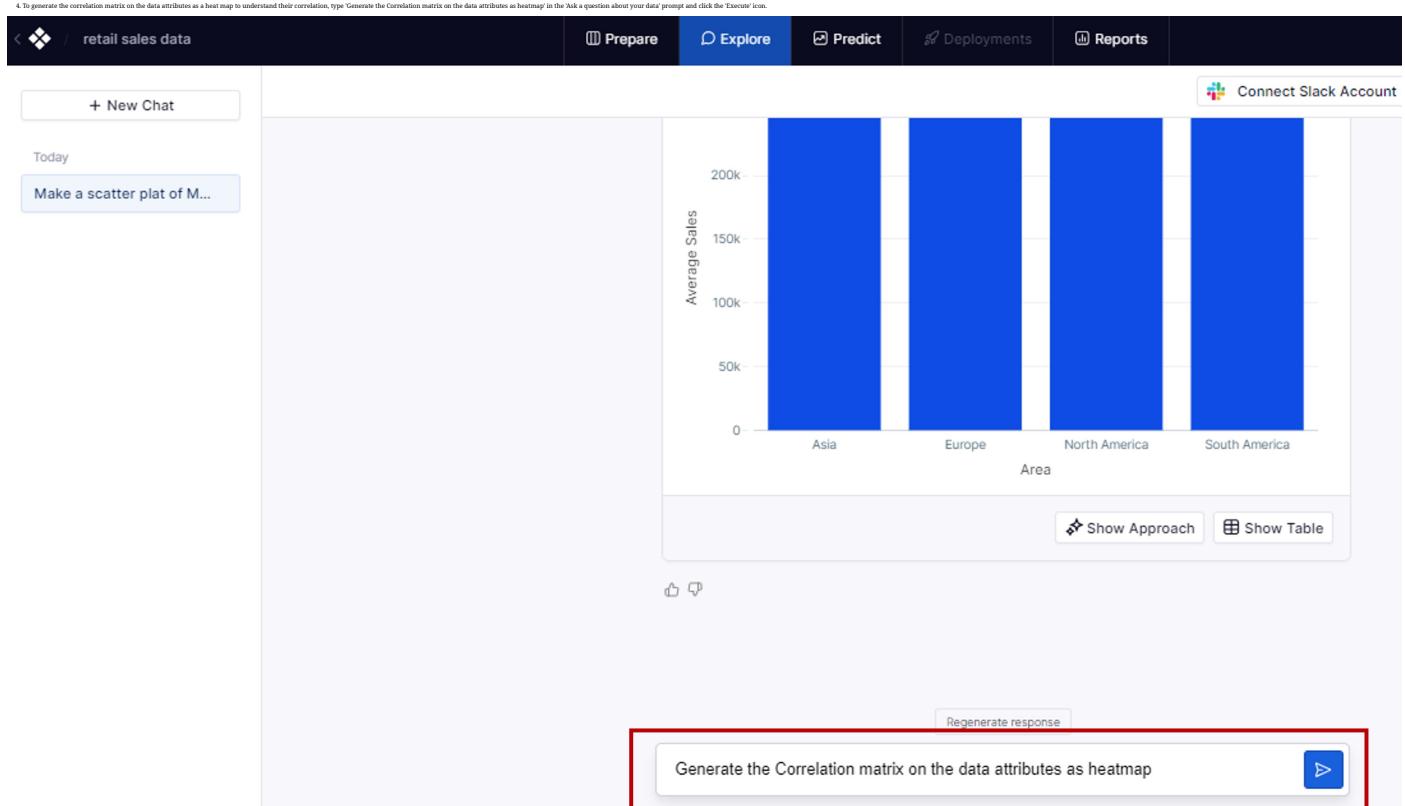
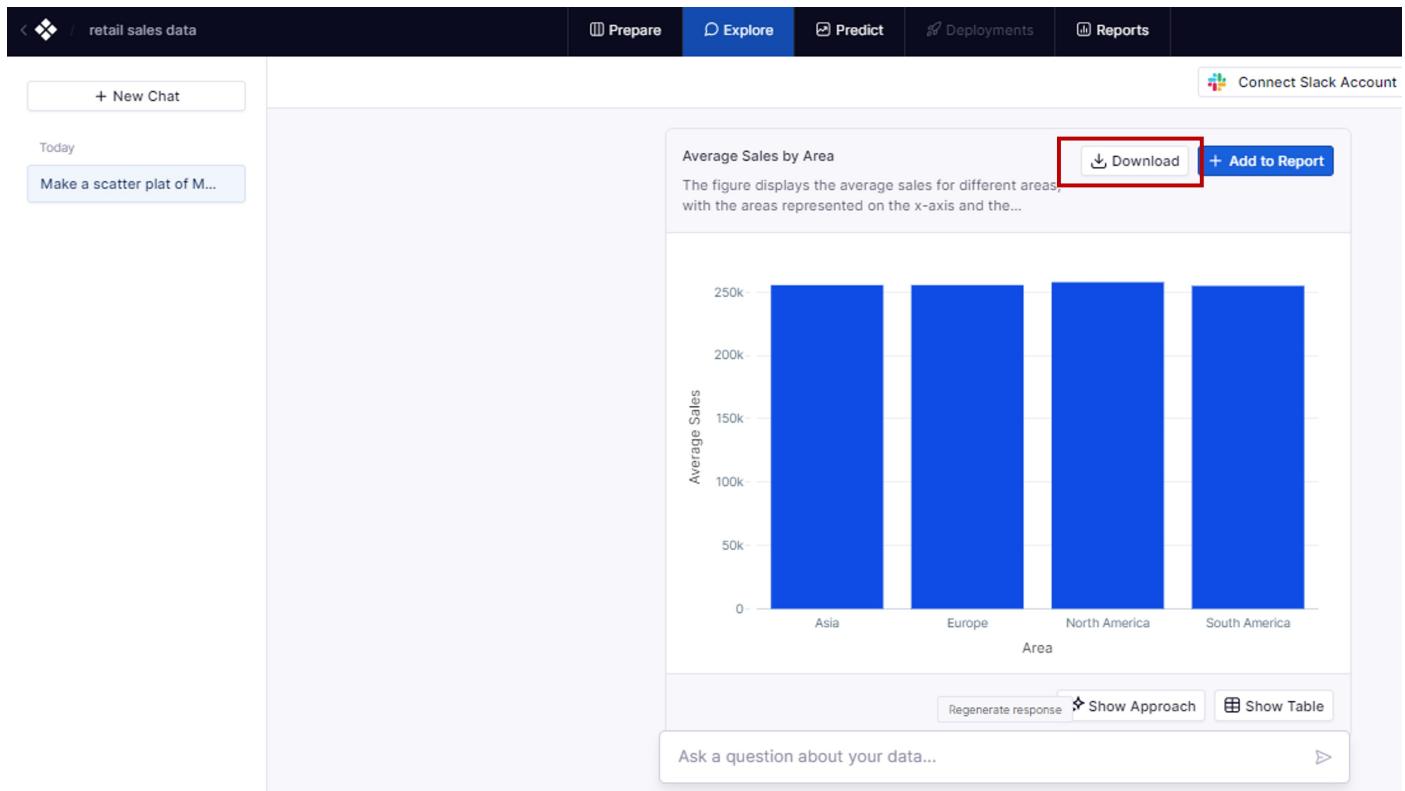
Prepare Explore Predict Deployments Reports Connect Slack Account (B)

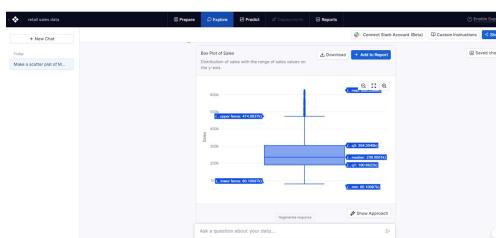
+ New Chat Today Make a scatter plot of M...

Sales

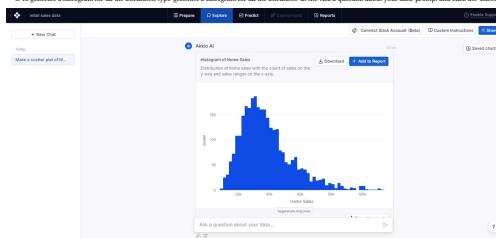
Marketing Spend

Create a bar chart that shows the average sales by area ➤





6. To generate a histogram for all the attributes, type 'generate a histogram for all the attributes' in the 'Ask a question about your data' prompt and click the 'Execute' icon. You can scroll up and down to see the histograms for all the attributes.



Task 2 (Optional): Sign up and create an account on Columns AI

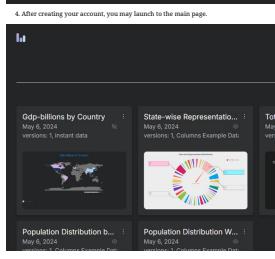
1. Sign up for Columns AI.
2. Open the link columns.ai and then click the 'Log in' button at the top right corner.

columns.ai

The screenshot shows the Columns AI homepage. The URL 'columns.ai' is highlighted with a red box. The page features a dark header with navigation links: Home, Gallery, Pricing, and Integrations. The main section has a large heading 'Beautify data for sharing' and a subtext 'data storytelling made easy'. Below this, there's a 'Product Experience' button. The page is divided into three main sections: 'Data' (with a bar chart icon), 'Insights' (with a circular icon), and 'Design' (with a book icon). Each section has a brief description: 'Data Integration: connect Google Spreadsheet, Notion, Airtable, Http API, SQL DB, CSV files, and more', 'Data Transformation: harnesses AI to effortlessly transforms your data into compelling visual narratives.', and 'Professional Storytelling content with Canva-like tools'.

3. You will see the 'Sign in or Sign up' page. You may continue with an existing Google or Slack account or create a new one by signing up.

The sign-up page for Columns AI. It features a logo with three vertical bars and the text 'Columns Effective Data Storytelling'. There are 'Sign in' and 'Sign up' buttons. The 'Sign up' button is highlighted with a red box. Below it are fields for 'Email address' and 'Password', both with placeholder text. At the bottom, there's a link 'By continuing, you agree to our terms and privacy policy' and a 'Sign up' button. There are also social media integration buttons for Google, Slack, and SSO.



Task 2.1: Connecting to the dataset

1. Click the 'Story' that is shown in the top right corner. A pop-up window will appear as 'How do you provide data?'.

Gdp-billions by Country : May 6, 2024 versions: 1, instant data

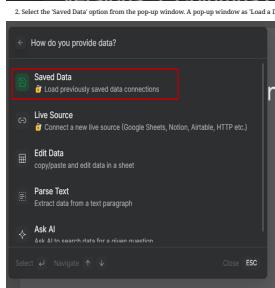
State-wise Representation Distribution : May 6, 2024 versions: 1, Columns Example Data

Total area by each State : May 6, 2024 versions: 1, Columns Example Data

Average : May 6, 2024 versions: 1

Population Distribution by Country : May 6, 2024 versions: 1, Columns Example Data

Population Distribution Within States : May 6, 2024 versions: 1, Columns Example Data



↑ > Downloads > archive

New folder

Name	Date modified	Type	Size
student-mat	15-05-2024 17:26	Microsoft Excel C...	41 KB
student-por	15-05-2024 17:26	Microsoft Excel C...	67 KB

Flexible Rc

ds

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ds

File name: student-mat

5. Once the CSV is added, click 'Upload' from the 'Connect your data' window.

6. Once you have uploaded, you can view the data. Then, click on 'Save'.

Connect data - student_mat_csv

preview meta info of the data

Name	Description
student_mat_csv	

7. Once the data is uploaded, you can explore the data by clicking the 'Explore' option from the Data & Query section.

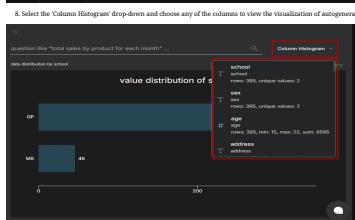
Advanced options for CSV upload

Delimiter: Comma

Comma Tab Semicolon

Exclude the second row (the second row has only meta data)

The screenshot shows the Columns AI interface. On the left, the 'Data & Query' section is open, with the 'Explore' button highlighted by a red box. Below it are sections for 'Metrics', 'Keys', and 'Conditions'. On the right, the 'Data Source' panel displays the 'student_mat_csv' dataset, showing its columns (school, sex, address, famsize, pstatus) and last update (2024-05-15 06:51). A preview table of the data is shown, with the first few rows of data.



Task 2.2: Generating Visuals using Columns AI

The screenshot shows the 'Data & Query' section with the 'Wizard' button highlighted by a red box. To the right, a chart titled 'Total number of male and female students in the data set' is displayed, showing two bars representing the count of male and female students.

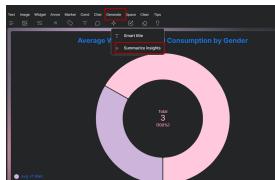
2. You can use the 'wizard' option from the 'Data & Query' section to generate a chart. You can generate a pie chart representing the average weekly alcohol consumption, identified by the Walc value for each gender. Click 'Make'.

The screenshot shows the 'Chart Wizard' interface. The 'Pie' tab is selected, highlighted by a red box. Below it, a chart area shows a single large blue bar representing the count of rows. The 'Choose values...' field contains 'Walc' and the 'Segmented by...' field contains 'sex', both highlighted by red boxes. A 'Make' button is at the bottom right.

1. Click 'Generate' and then select 'Smart Title' a title is generated for the chart.



4 Click 'Generate' and then select 'Summarize insight' to generate insight on this chart. You can edit the annotated insight if you want to.



Annotation Delete

Text Image Widget Arrow Marker Cond Chat Generate Space Clear Tips

Enter ↵ for next line...

Add link Add image

avg of Walc

Average Weekend Alcohol Consumption by G

This pie chart represents the average weekend alcohol consumption (walc.AVG) of students based on their gender. The chart shows that female students have an average weekend alcohol consumption of 1, while male students have an average of 2. This indicates that male students tend to consume more alcohol on weekends compared to female students. The data suggests a gender disparity in weekend alcohol consumption among students.

The final version of the pie chart with the following annotations and styling:

- Annotations:** A large red box highlights the explanatory text at the top right of the chart area. Below it, a smaller red box highlights the "avg of Walc" label at the bottom left.
- Theme:** The "neon" theme is selected, changing the overall color palette to neon colors.
- Background:** The background is set to "neon".
- Color palette:** The color palette is set to "neon".
- Value format:** "auto" is selected.
- Decimal count:** "0" is selected.

Theme Customize my theme

neon Canvas Background

avg of Walc

Text Image Widget Arrow Marker Cond Chat Generate Space Clear Tips

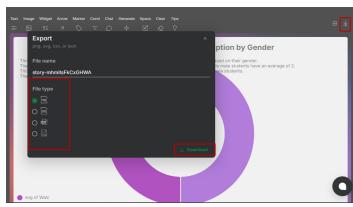
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- Theme:** The "neon" theme is selected, changing the overall color palette to neon colors.
- Background:** The background is set to "neon".
- Color palette:** The color palette is set to "neon".
- Value format:** "auto" is selected.
- Decimal count:** "0" is selected.

6 Once done with the customizations, you can download it either as a PNG or SVG image file or as a CSV or JSON data file by clicking the download icon on the top right corner, choosing the required file type from the list, and selecting the 'Download' option.

**Conclusion**

In this lab, you learned how to use the Column AI and Akkio platforms to generate various visuals from datasets. You connected to datasets, generated visuals using natural language prompts, modified chart color themes, and created different types of charts to analyze the data effectively. By leveraging these generative AI tools, you can streamline your data analysis process and gain insights quickly and efficiently.

Author:

Sudha Driva

**Skills Network**