

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](#)
- Generate visuals
- Change the color 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 and 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 add 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 `student-mat.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 Mousinho da Silveira includes several pertinence values. Examples of such data are records of demographic information, grades, and alcohol consumption.

Field	Description
school	GP/MS for the student's school
sex	M/F for gender
age	15-22 for the student's age
address	U/R for urban or rural, respectively
fam size	LE3/GT3 for less than or greater than three family members
Pstatus	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
Fedu	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 hr) / 4 (>1hr) for a time from home to school
studytime	1 (<2hrs) / 2 (2 - 5hrs) / 3 (5 - 10hrs) / 4 (>10hrs) for weekly study time
failures	1-3/4 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	0-93 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.



akkio.com



The
for a

Wow you

happy w

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

Akkio Generative BI fo

Akkio lets you add AI-powered analysis to your service offering, so your clients can analyze data, create live charts and graphs by asking. Sign up now for a free trial and see how Akkio can help your agency and drive new revenue.



avocado prices

Forecast Forecast or create a time dependent model

TRAINING DATASET
Select a dataset to train a model.
AVOCADO PRICES.CSV

TIME
Choose which field corresponds to time in your dataset.
DATE

ID FIELD
For datasets that contain more than one sequence, select an ID field to generate forecasts for each subsequence independently. A subsequence must contain at least 5 items to be included in the forecast.
Optional

PREDICT FIELDS
Select which numerical or categorical fields to predict and optionally ignore.
Predict **Ignore**

Time Dependent To
Individual factors ranked by their influence on the forecast.

Factor
4770

Model
0.0000

Select All	Search Fields
<input checked="" type="checkbox"/>	average_price
<input type="checkbox"/>	total_volume
<input type="checkbox"/>	4046
<input type="checkbox"/>	4225
<input type="checkbox"/>	4770



Watch Demo

Schedule

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- After creating your account, you will get a pop-up window as 'How are you planning to use Akkio?', you can choose the relevant option and click 'Continue'. You can skip the rest of the pop-up windows, as it's optional. Once the setup is completed, you will get a pop-up window as 'Enjoy Your Free Trial! 🎉'. Click on 'Get Started'.





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

N



Chat Data Prep



Clean



M



3	Manager	24
4	Executive	3
5	Director	29
6	Consultant	27
7	Executive	28
8	Assistant	9

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.



Proj



Sathya's Team



Projects

7



Dashboards



Integrations



Datasets

Develo

JOB Title

Assistant

Manager

Manager

Executive

Not

Settings



Sathya Priya
Trial



- 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's Project (1)



CSV

Upload File



Not Connected

[Google BigQuery](#)



< Back



Upload Dataset

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

Task 1.2: Generating visuals using Akkio

1. 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



retail sales data.csv

3,000 rows, 9 columns



No transforms applied



Chat Data Prep



Clean



Merge

Store ID	Employee Number	Category
Number (Integer)	Number (Integer)	Sc
		As
1	54	Or
2	57	Sc
3	50	As
4	56	Or

5	1	50	A
6	1	56	A
7	1	52	A
8	1	56	A
9	1	55	A
10	1	58	A



< retail sales data



No chat history

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

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'.



< diamond / retail sales data

+ New Chat

Today

Make a scatter plot of M...



< retail sales data

+ New Chat

Today

Make a scatter plot of M...

3. 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

+ New Chat

Today

Make a scatter plot of M...



< diamond / retail sales data

+ New Chat

Today

Make a scatter plot of M...

4. To generate the correlation matrix on the data attributes as a heat map to understand their correlation, type 'Generate the Correlation matrix on the data attributes as heatmap' in the 'Ask a question about your data' prompt and click the 'Execute' icon.

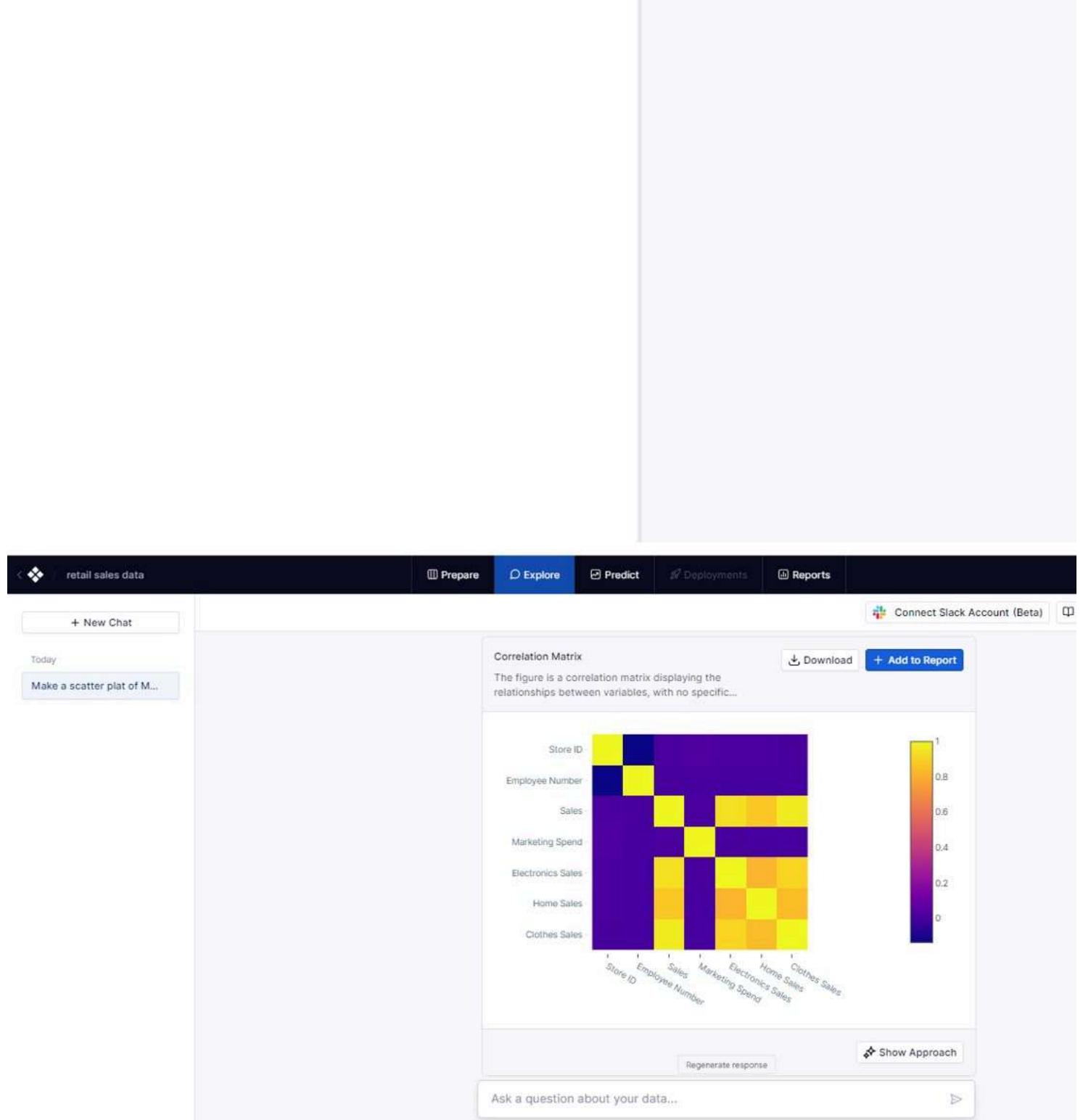


/ retail sales data

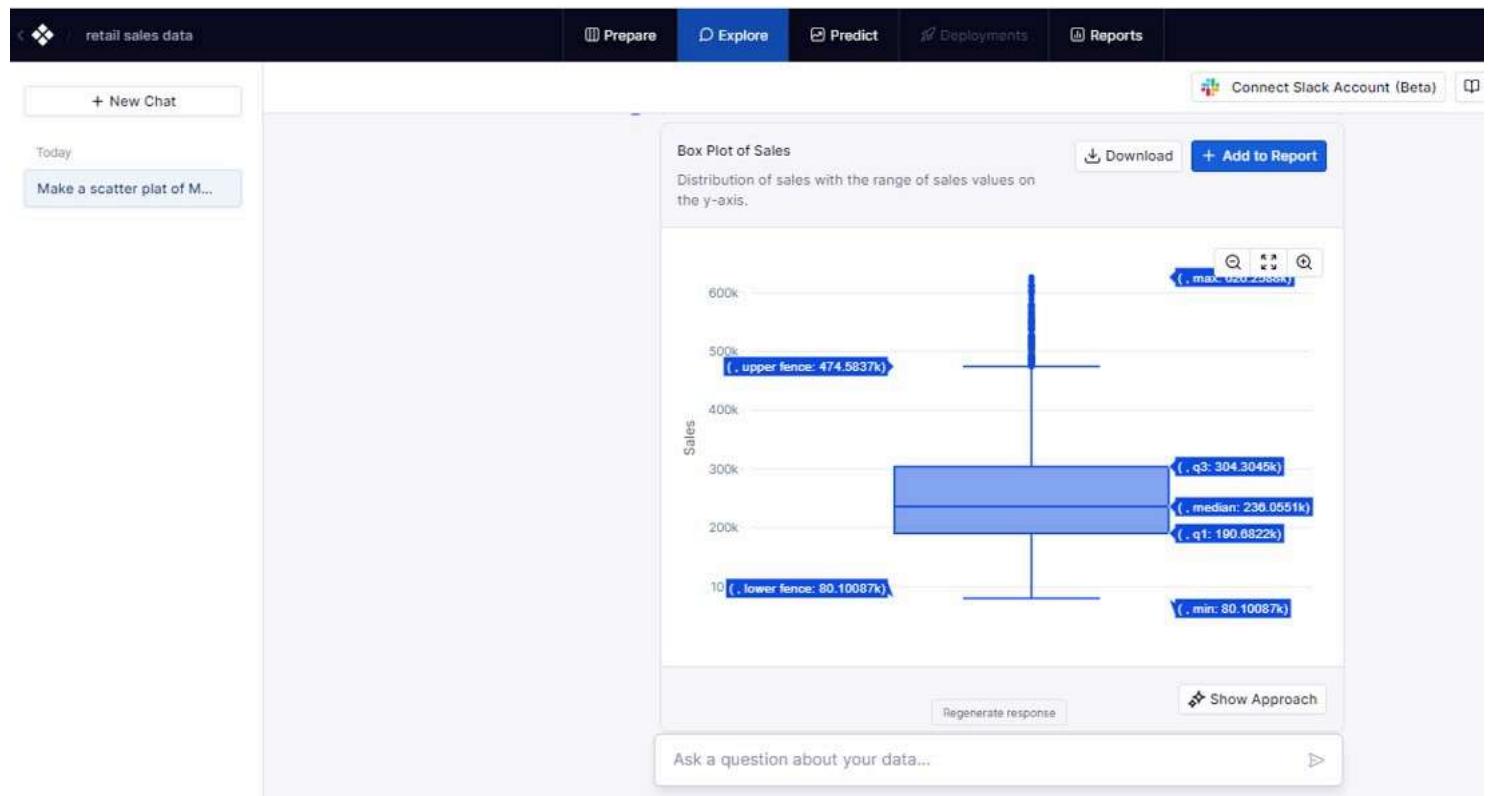
+ New Chat

Today

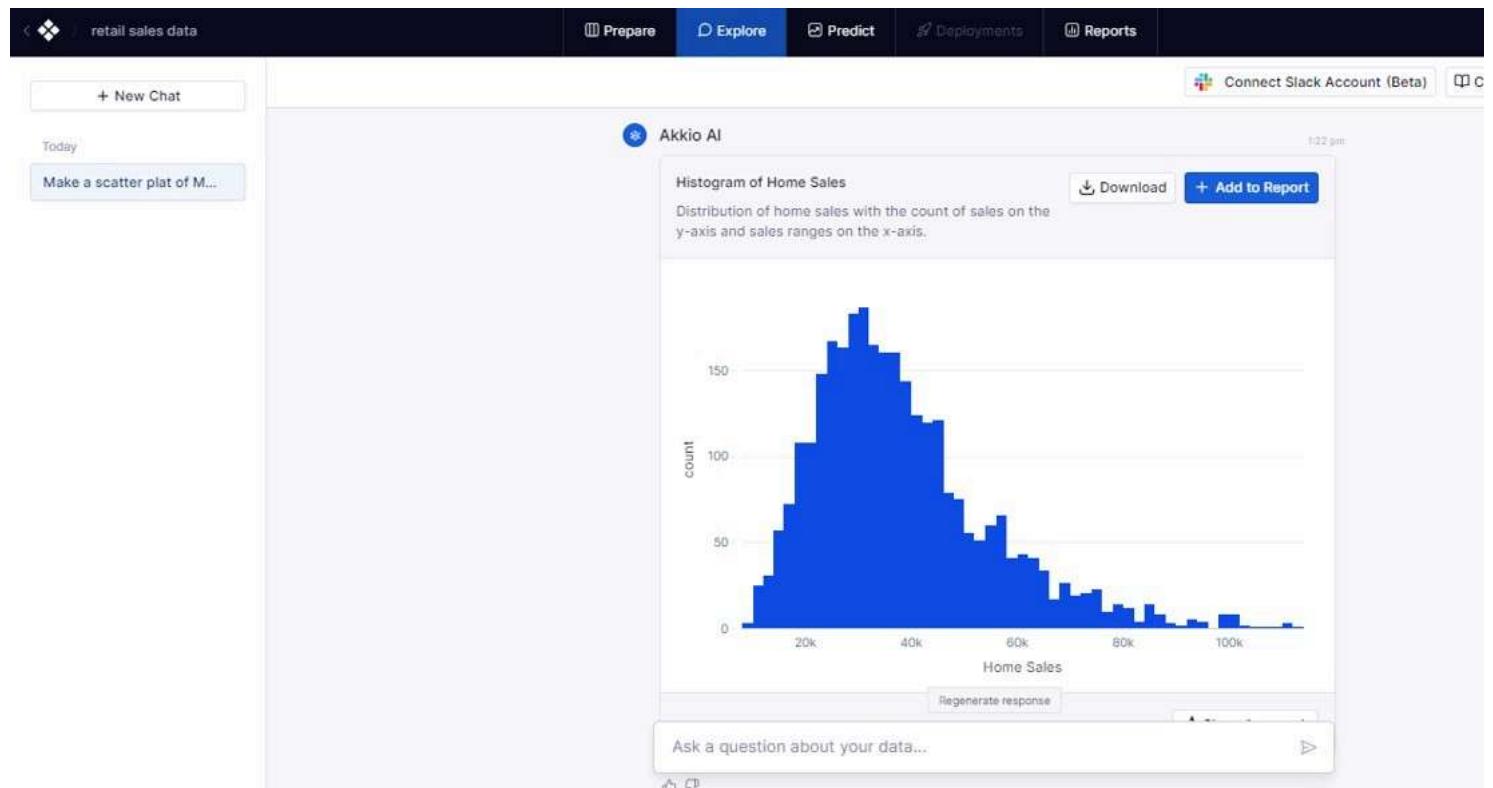
Make a scatter plot of M...



5. To generate box plots for verifying outliers, type 'Generate box plots to verify any outliers' in the 'Ask a question about your data' prompt and click the 'Execute' icon.



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 'Login' button at the top right corner.

←

→

⟳



columns.ai



Home

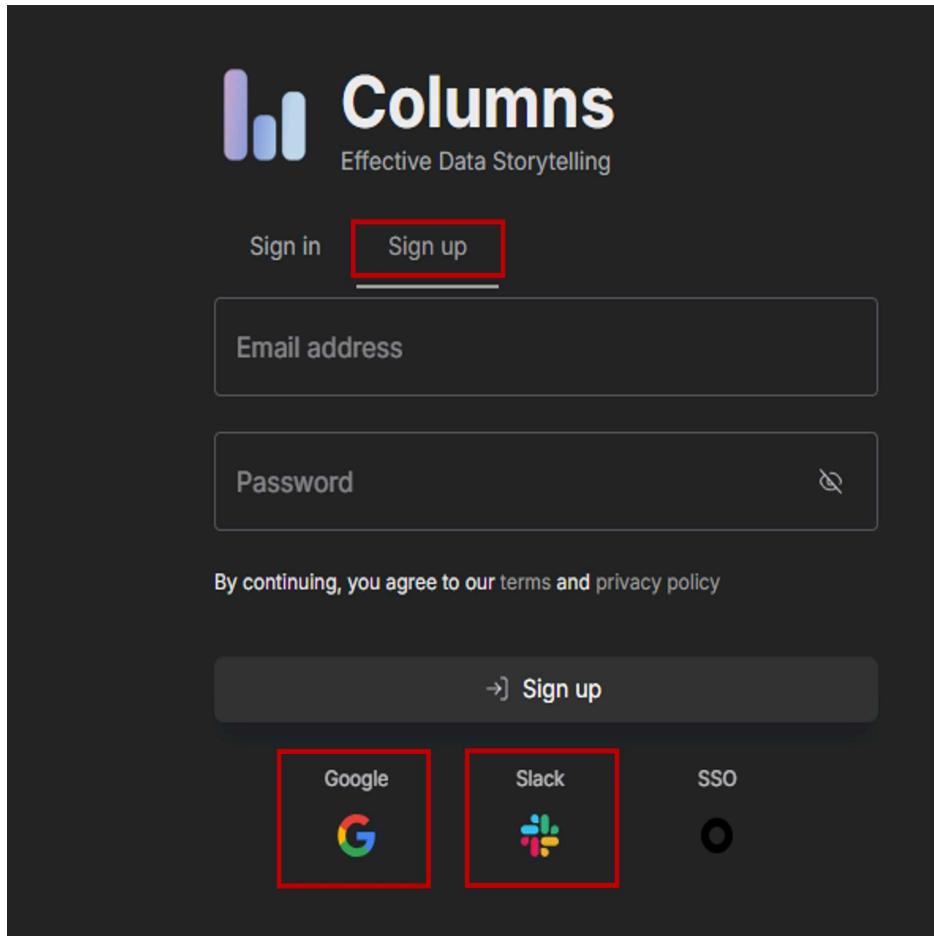
Gallery

Price

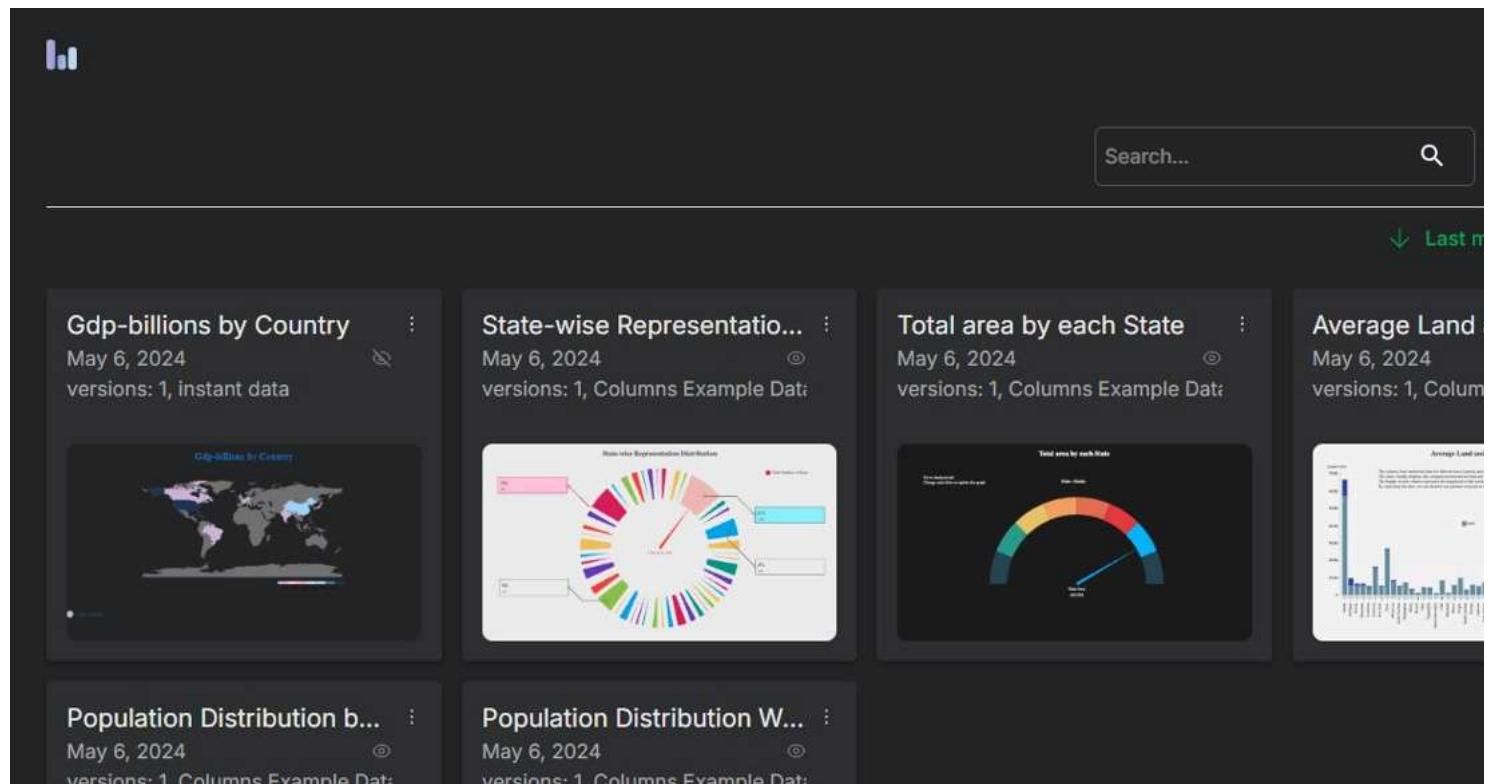


Data Integration: connect Google Spread Notion, Airtable, Http API, SQL DB, CSV fi

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.



4. After creating your account, you may launch to the main page.



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



:

Gdp-billions by Country



Copy & Paste

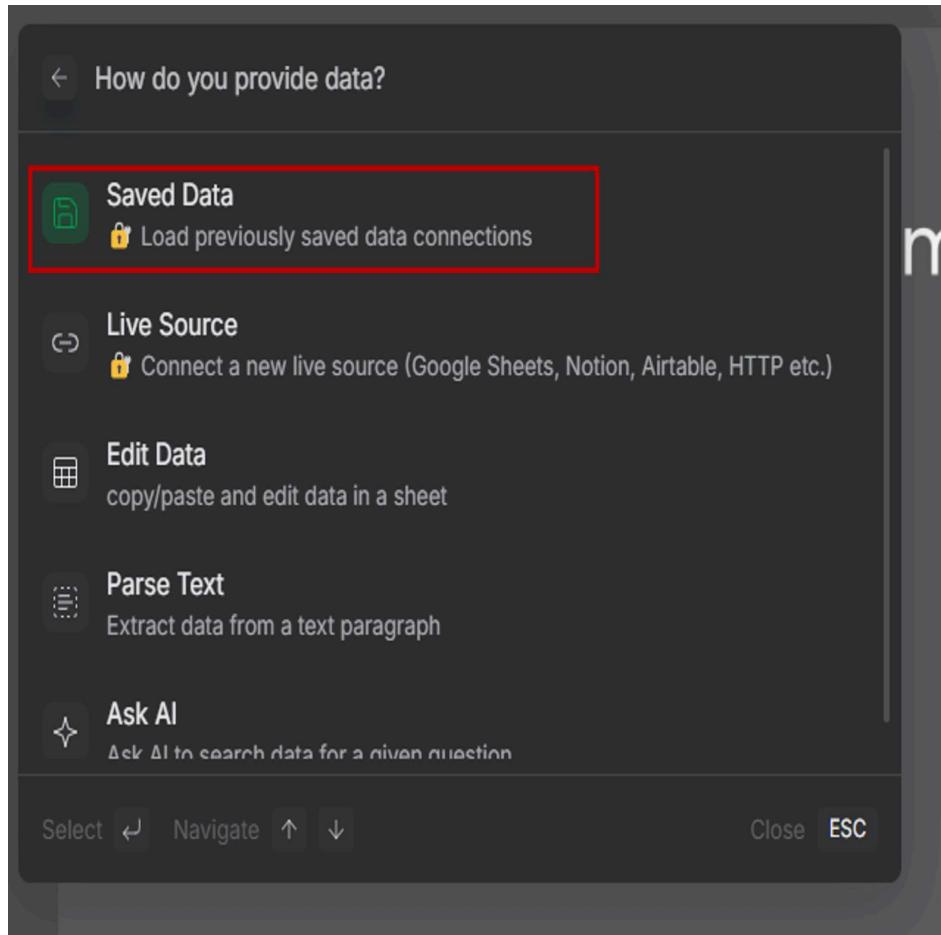
Population Distribution b...

May 6, 2024



versions: 1 Columns Example Data

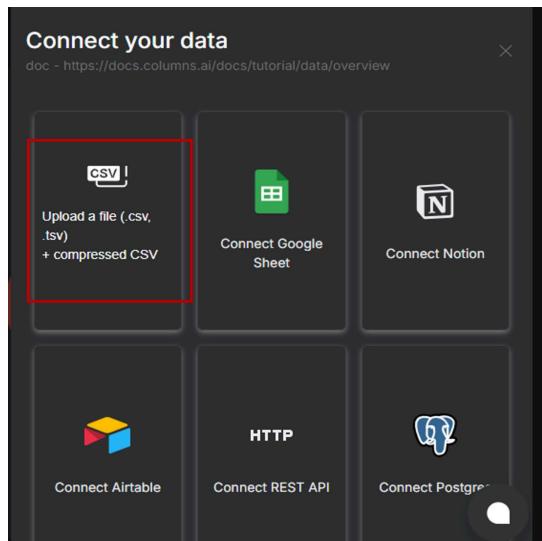
2. Select the 'Saved Data' option from the pop-up window. A pop-up window as 'Load a Dataset' will appear.



3. Select the 'Connect new data' option from the pop-up window.



4. Select the 'Upload a file (csv)' from the Connect your data window. Choose the 'student-mat.csv' file from your computer.





> Downloads > archive

New folder

Name

▼ Today

student-mat

student-por

Flexible Ro



ds

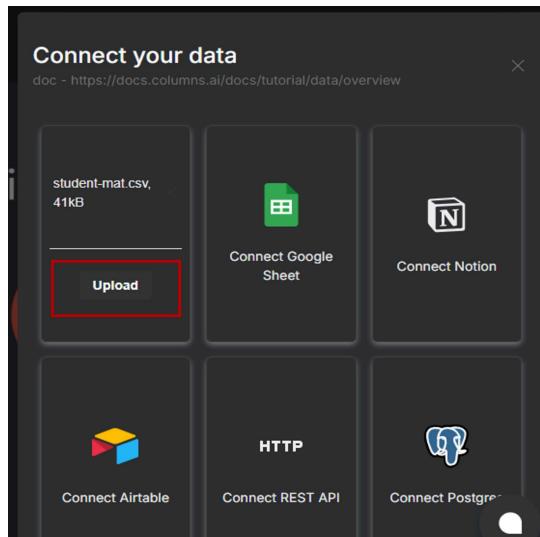


ots

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 _____

student_mat_csv

T school



T sex

GP

F

GP

F

GP

F

GP

F

GP

F

GP

M

GP

M

Advanced options for CSV upload

Delimiter



Comma



Tab



Semicolon



Exclude the second row (the second row has only me

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



Σ

Data & Query

Load data and generate query

tour

student_mat_csv



Explore

Wizard



Ideas

Metrics

values to display

add

no metrics selected

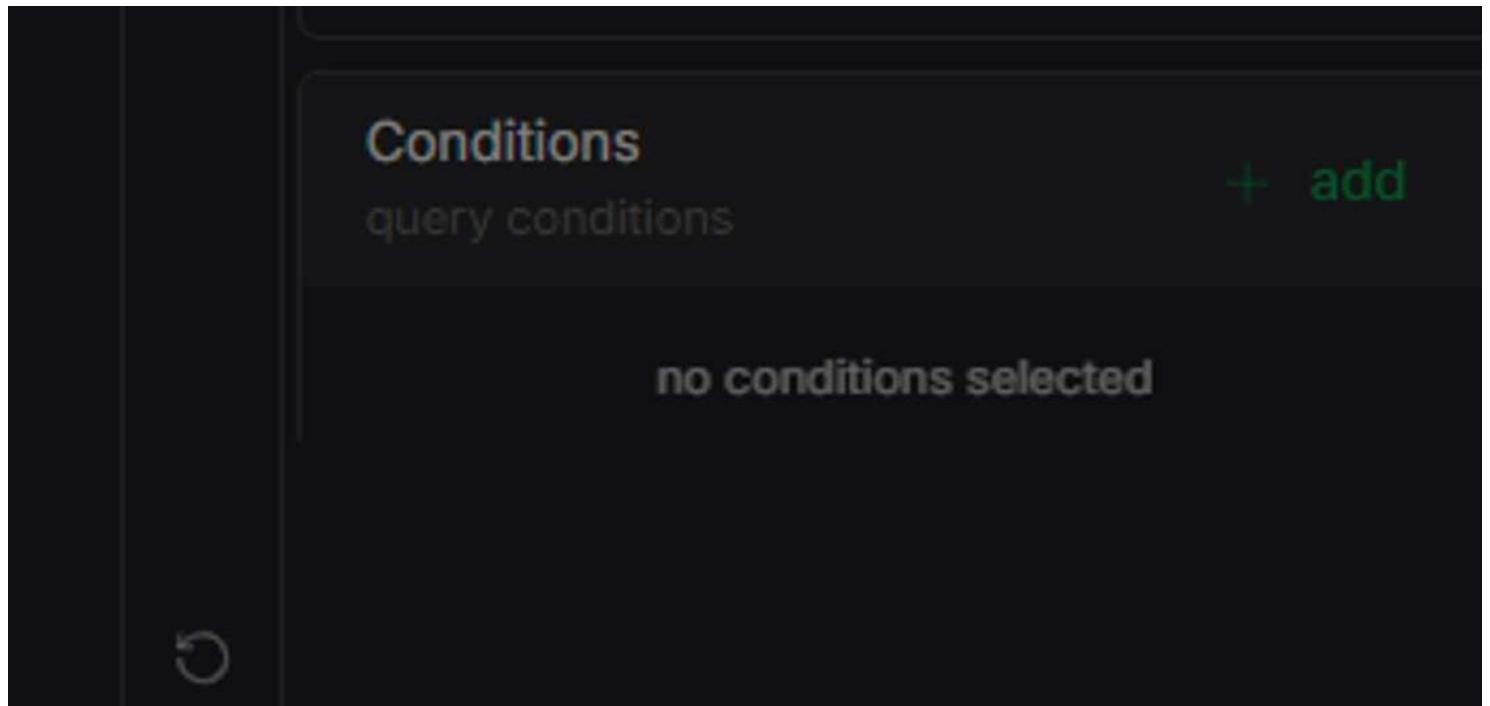
Keys

segmented by

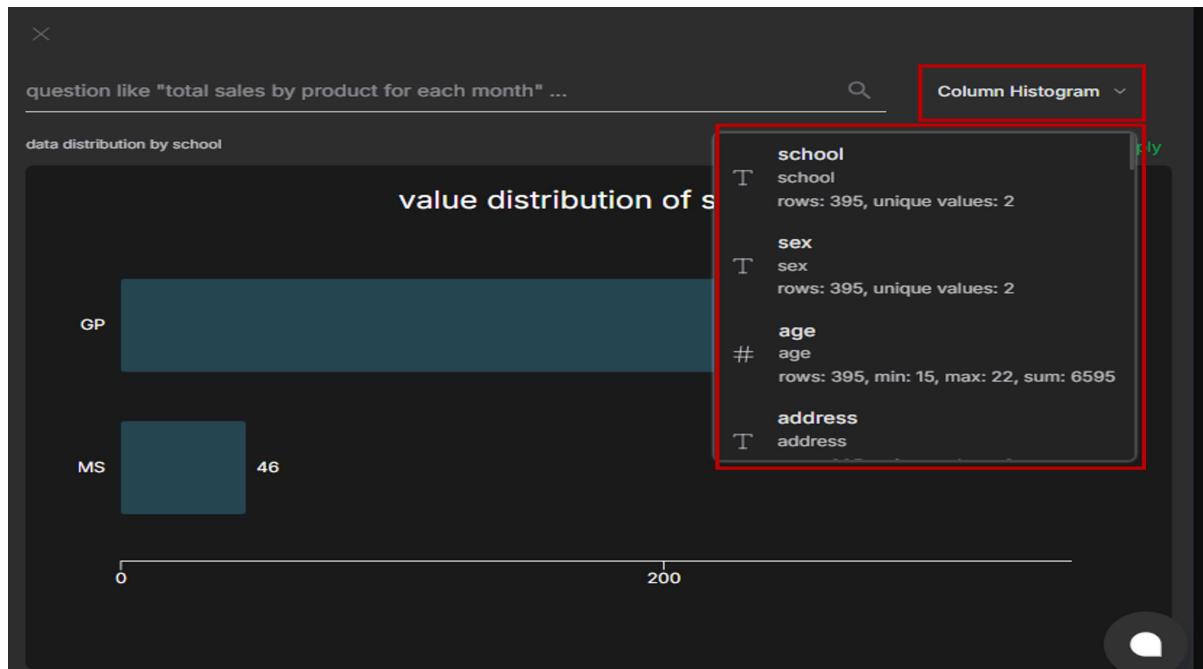
add

no keys selected

Transform Key



8. Select the 'Column Histogram' drop-down and choose any of the columns to view the visualization of autogenerated charts and statistics from the data.



Task 2.2: Generating Visuals using Columns AI

1. To find the total number of male and female students in the dataset. Type "total number of male and female students in the dataset" in the 'Question' prompt and click the 'Search' button. A bar chart will appear with the sorted result. You can click 'Apply' to view and use it for the dataset.

total number of male and female students in the data set.

place for a graph...

Data Source

student_mat_csv (no description)	Columns source type	2024-05-15 06:51:53 last updated	CSV data format																																																								
Edit Schema <table border="1"> <thead> <tr> <th>school</th> <th>sex</th> <th>address</th> <th>famsize</th> <th>pstatus</th> <th>mjob</th> <th>fjob</th> <th>cou</th> </tr> </thead> <tbody> <tr><td>GP</td><td>F</td><td>U</td><td>GT3</td><td>A</td><td>at_home</td><td>teacher</td><td>cou</td></tr> <tr><td>GP</td><td>F</td><td>U</td><td>GT3</td><td>T</td><td>at_home</td><td>other</td><td>cou</td></tr> <tr><td>GP</td><td>F</td><td>U</td><td>LE3</td><td>T</td><td>at_home</td><td>other</td><td>oth</td></tr> <tr><td>GP</td><td>F</td><td>U</td><td>GT3</td><td>T</td><td>health</td><td>services</td><td>hor</td></tr> <tr><td>GP</td><td>F</td><td>U</td><td>GT3</td><td>T</td><td>other</td><td>other</td><td>hor</td></tr> <tr><td>GP</td><td>M</td><td>U</td><td>LE3</td><td>T</td><td>services</td><td>other</td><td>rep</td></tr> </tbody> </table>				school	sex	address	famsize	pstatus	mjob	fjob	cou	GP	F	U	GT3	A	at_home	teacher	cou	GP	F	U	GT3	T	at_home	other	cou	GP	F	U	LE3	T	at_home	other	oth	GP	F	U	GT3	T	health	services	hor	GP	F	U	GT3	T	other	other	hor	GP	M	U	LE3	T	services	other	rep
school	sex	address	famsize	pstatus	mjob	fjob	cou																																																				
GP	F	U	GT3	A	at_home	teacher	cou																																																				
GP	F	U	GT3	T	at_home	other	cou																																																				
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GP	F	U	GT3	T	health	services	hor																																																				
GP	F	U	GT3	T	other	other	hor																																																				
GP	M	U	LE3	T	services	other	rep																																																				

total number of male and female students in the data set. → Apply

200

100

0

F M

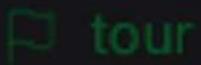
● count of Rows

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'.



Data & Query

Load data and generate query



student_mat_csv



Explore

Wizard



Ideas

Chart

run a wizard to make a chart

Bar

Line

Pie

Table

Map

Scatter

Tree

Radar

Boxplot

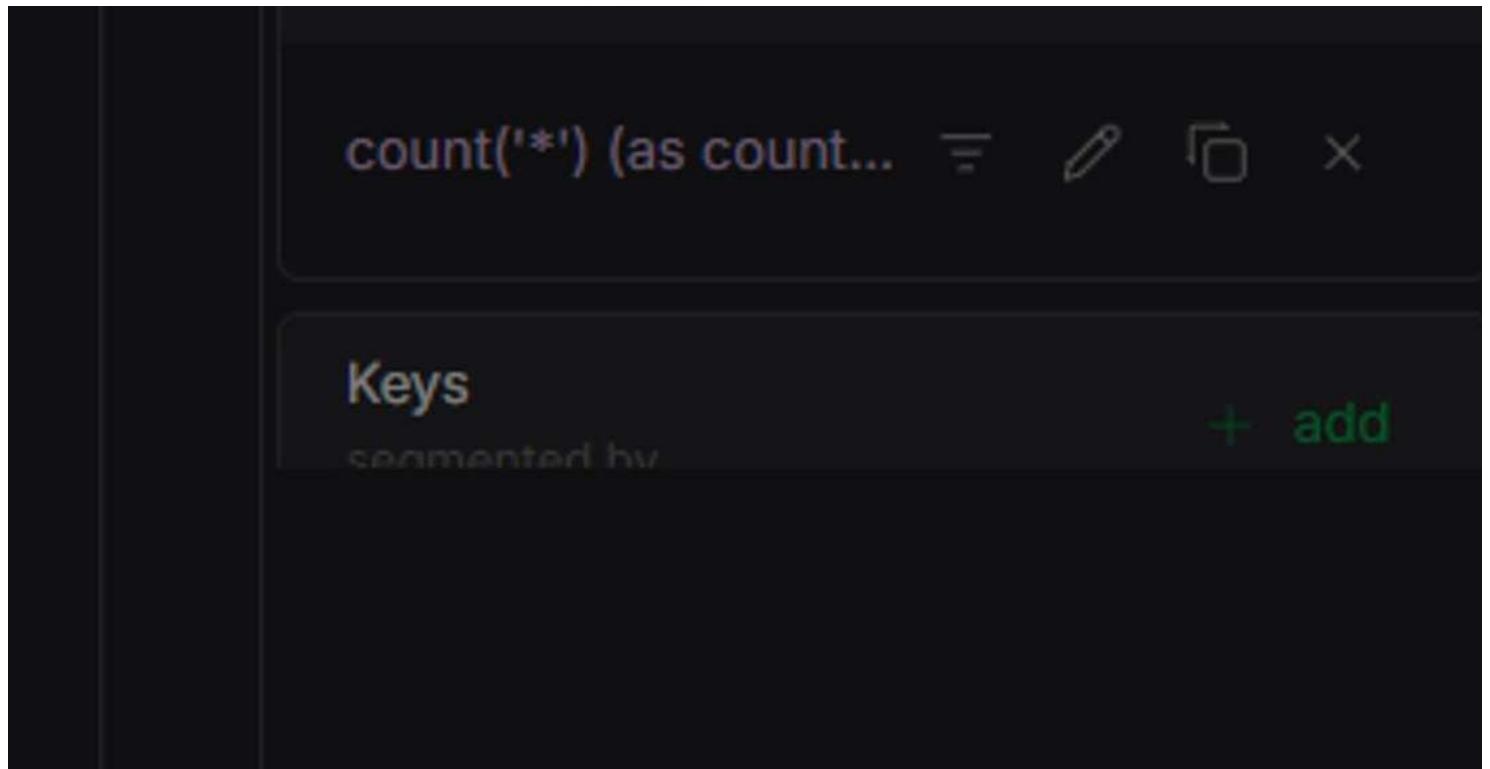
Word Cloud

Gauge

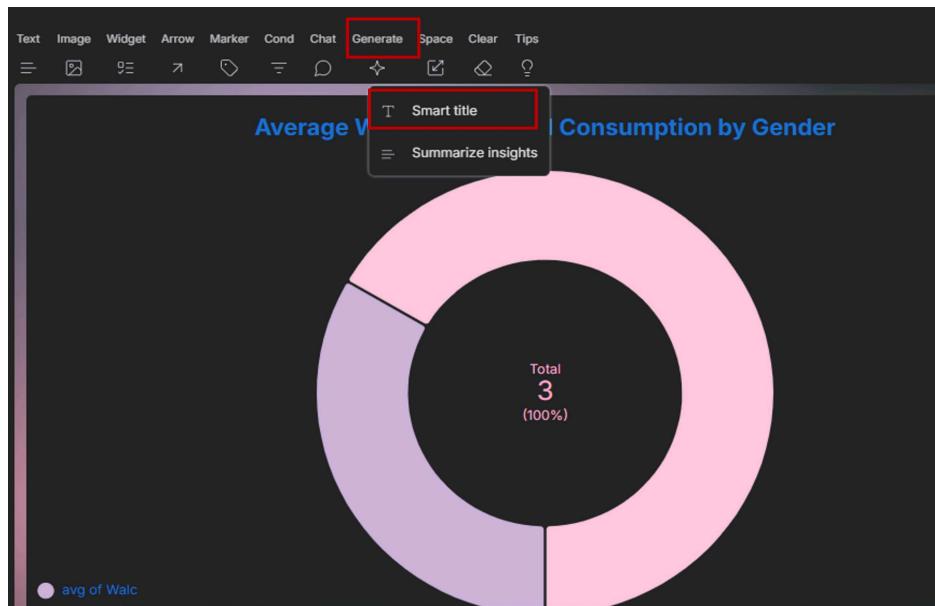
Metrics

values to display

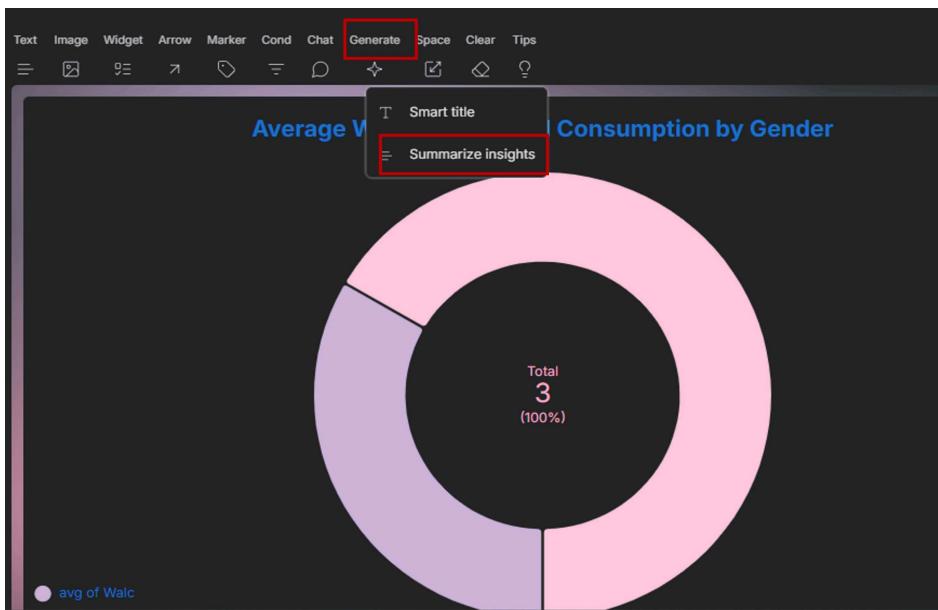
+ add



3. 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

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.

Enter ↵ for next line...

↪ **Add link**



📷 **Add image**



5. You can also change the chart appearance by clicking the 'General Setting' icon and choosing any 'Theme'.

The image shows a mobile application's settings interface with a dark background. On the left, there is a vertical sidebar with icons: a file folder, a share icon, a sigma symbol, a gear icon (which is highlighted with a red box), a circular arrow icon, and a hash symbol.

Theme

Customize my theme

neon

Canvas Background

Palette

Sketchy

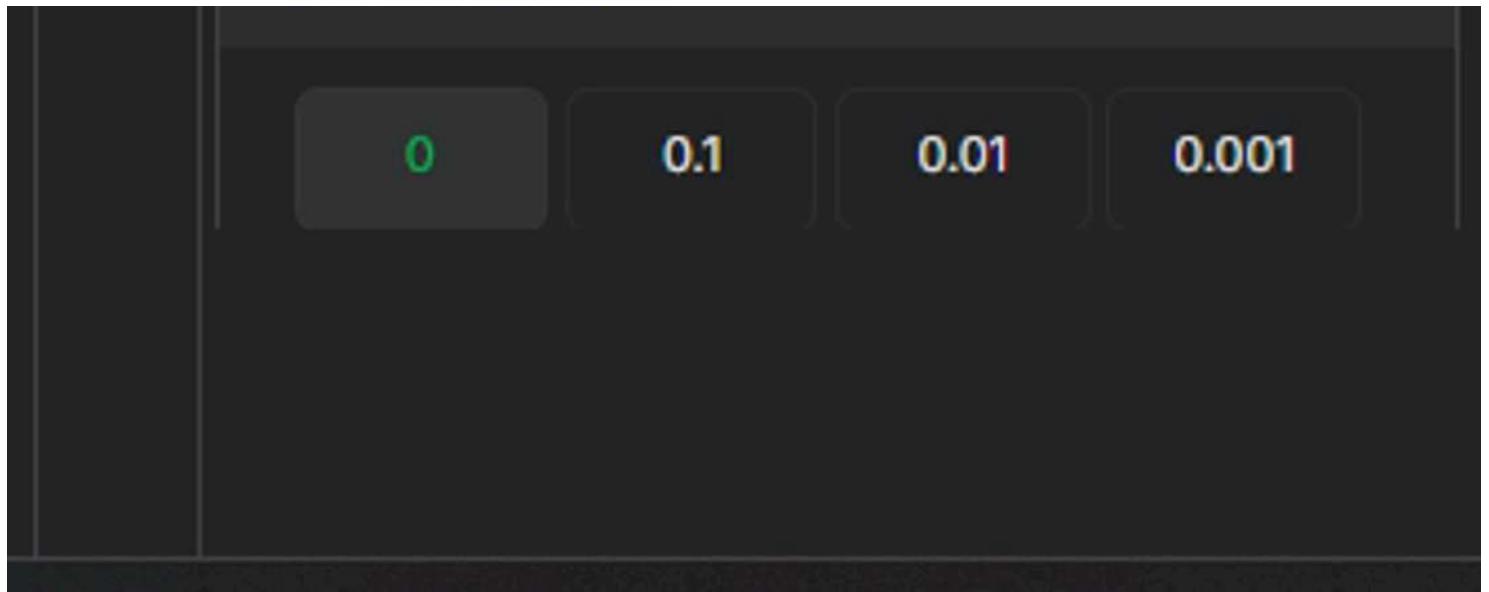
Value format

auto full thousand

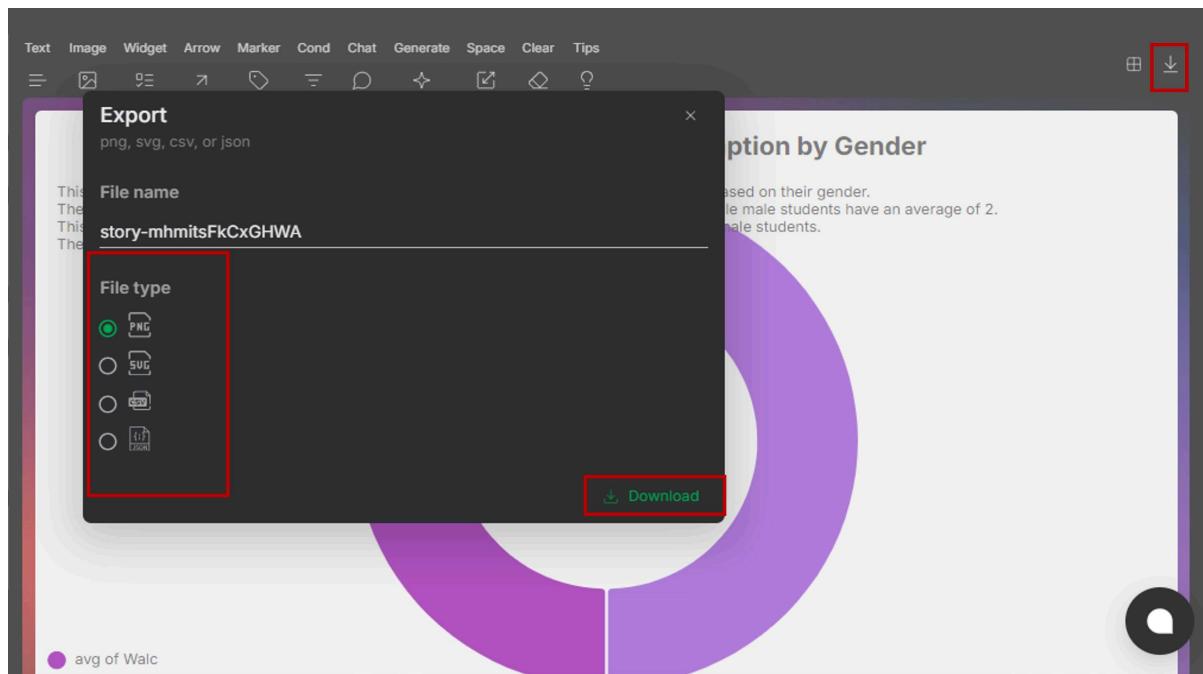
million billion percentage

Decimal count

This screen allows users to customize the application's appearance. It includes sections for themes (with a preview of five color palettes), canvas background colors, palette colors, sketchy mode, value formats (including auto, full, thousand, million, billion, and percentage), and decimal counts.



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 Columns 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:

[Sathya Priya](#)



Skills Network