Exploratory data analysis on Azure Databricks

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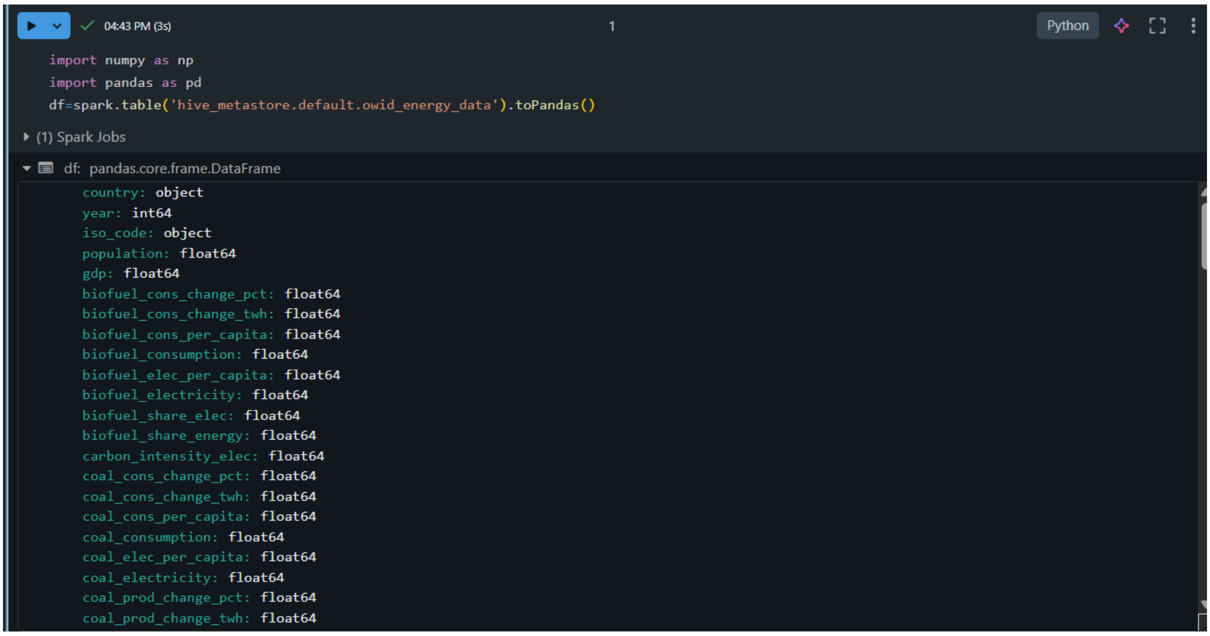
Load CSV file

Create a pandas DataFrame from the dataset for easier processing and visualization. Replace the file path below with the one you copied earlier.

import numpy as np

import pandas as pd

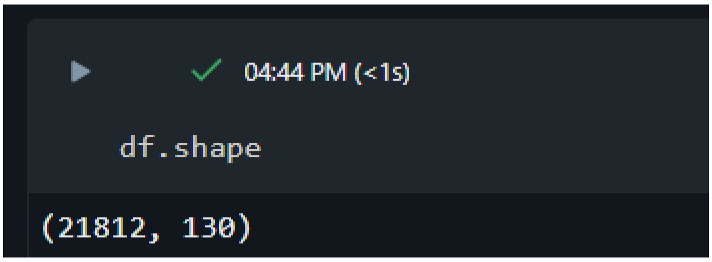
df=spark.table('hive_metastore.default.owid_energy_data').toPandas()



Use pandas for data insights

The df.shape command returns the dimensions of the DataFrame, giving you a quick overview of the number of rows and columns.

df.shape



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df.describe()

The df.describe() command generates descriptive statistics for numerical columns, such as mean, standard deviation, and percentiles, which can help you identify patterns, detect anomalies, and understand the distribution of your data.

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```
df.describe()
```

	year	population	gdp	biofuel_cons_change_pct	biofuel_cons_change_twh	biofuel_cons_per_capita	biofuel_consumption	biofuel_elec_per_capi
count	21812.000000	1.844700e+04	1.177500e+04	1806.000000	2796.000000	2400.000000	2876.000000	5570.0000
mean	1974.195718	1.054051e+08	4.260596e+11	45.489759	2.867027	136.600523	39.082519	66.7508
std	35.342860	4.665375e+08	3.508591e+12	266.131064	10.692769	261.757657	116.307666	197.5421
min	1900.000000	1.833000e+03	1.642060e+08	-100.000000	-49.355000	0.000000	0.000000	0.0000
25%	1946.000000	1.714291e+06	1.438637e+10	-0.500000	0.000000	0.000000	0.000000	0.0000
50%	1984.000000	6.998022e+06	4.393385e+10	8.189000	0.000000	14.642500	0.694500	0.4910
75%	2004.000000	2.571993e+07	1.830838e+11	26.550000	0.832000	175.006500	12.811500	38.1627
max	2023.000000	8.045311e+09	1.301126e+14	5659.328000	144.146000	2588.512000	1317.625000	2453.0430

8 rows × 128 columns

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df.info()

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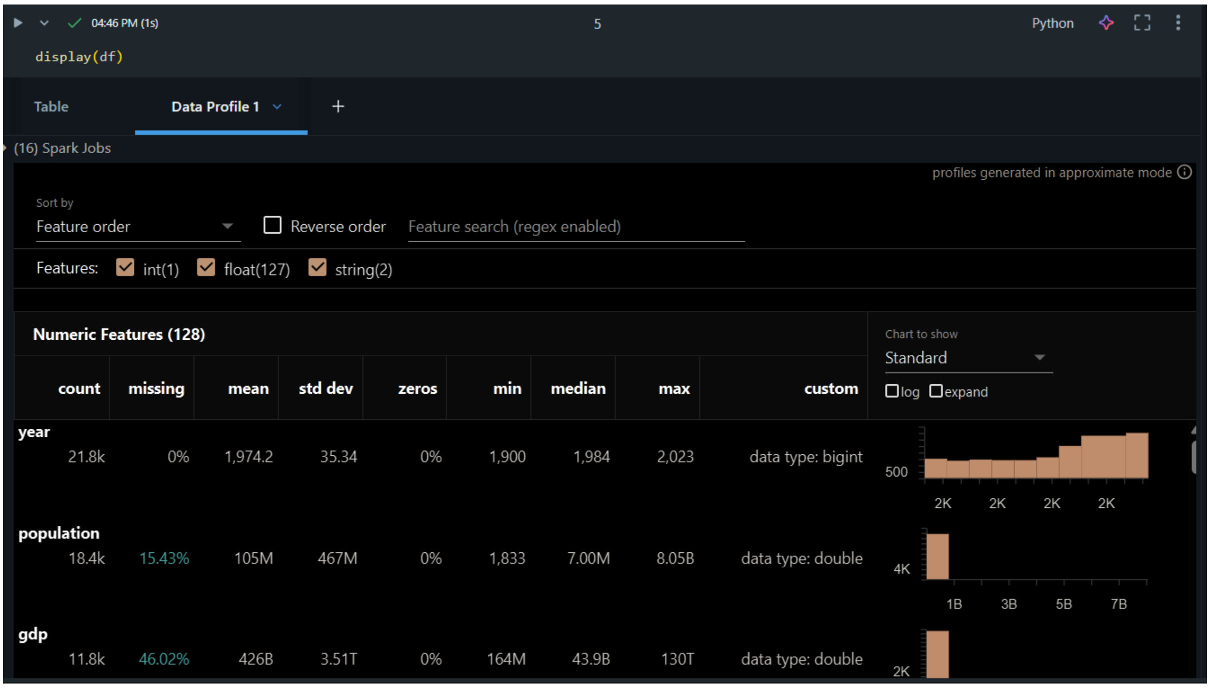
```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 21812 entries, 0 to 21811
Columns: 130 entries, country to wind_share_energy
dtypes: float64(127), int64(1), object(2)
memory usage: 21.6+ MB
```

Generate a data profile

Click + > Data Profile next to the Table in the output. This runs a new command that generates a profile of the data in the DataFrame.

display(df)



Clean the data

Remove duplicate data

Check if the data has any duplicate rows or columns. If so, remove them.

duplicate_rows = df.duplicated().sum()

duplicate_columns = df.columns[df.columns.duplicated()].tolist()

print("Duplicate rows count:", duplicate_rows)

print("Duplicate columns:", duplicate_columns)

df = df.drop_duplicates()

df = df.loc[:, ~df.columns.duplicated()]

```
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duplicate_rows = df.duplicated().sum()

duplicate_columns = df.columns[df.columns.duplicated()].tolist()

print("Duplicate rows count:", duplicate_rows)
print("Duplicate columns:", duplicate_columns)

df = df.drop_duplicates()

df = df.loc[:, ~df.columns.duplicated()]

df: pandas.core.frame.DataFrame = [country: object, year: int64 ... 128 more fields]
Duplicate rows count: 0
Duplicate columns: []
```

Handle null or missing values

A common way to treat NaN or Null values is to replace them with 0 for easier mathematical processing.

df = df.fillna(0)

```
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df = df.fillna(0)

df: pandas.core.frame.DataFrame = [country: object, year: int64 ... 128 more fields]
```

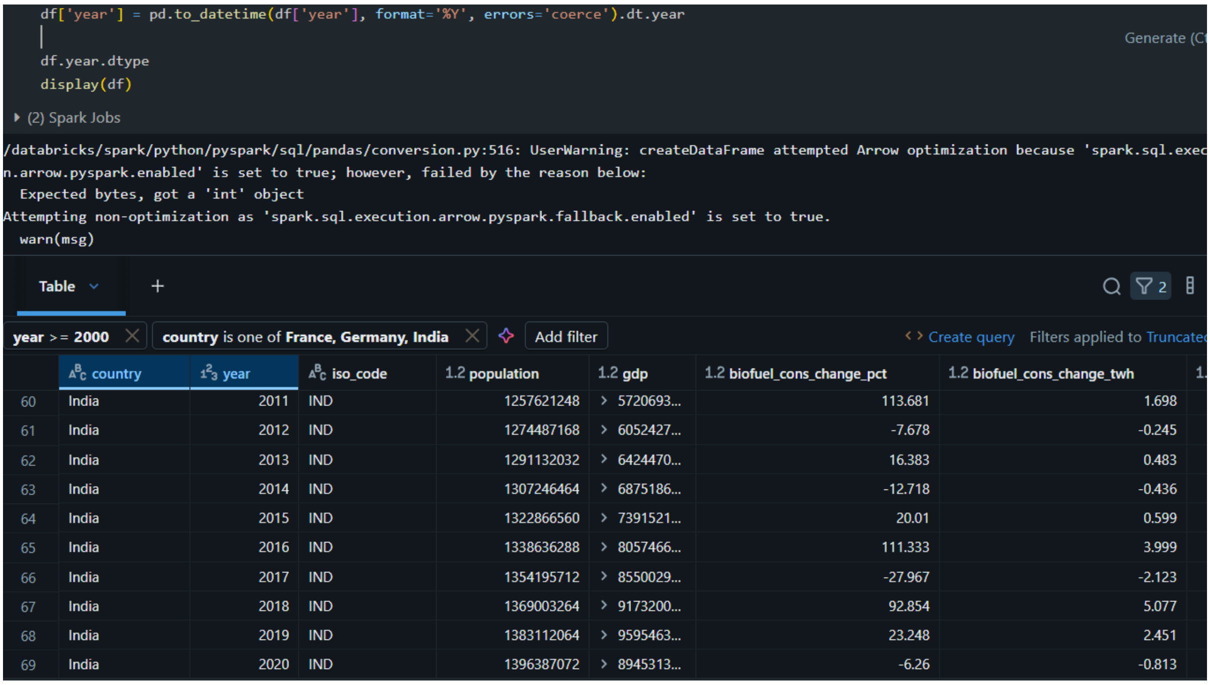
Reformat dates

Dates are often formatted in various ways in different datasets. They might be in date format, strings, or integers.

df['year'] = pd.to_datetime(df['year'], format='%Y', errors='coerce').dt.year

df.year.dtype

display(df)



```
df['year'] = pd.to_datetime(df['year'], format='%Y', errors='coerce').dt.year

df.year.dtype
display(df)
```

Generate (C

(2) Spark Jobs

```
/databricks/spark/python/pyspark/sql/pandas/conversion.py:516: UserWarning: createDataFrame attempted Arrow optimization because 'spark.sql.exec
n.arrow.pyspark.enabled' is set to true; however, failed by the reason below:
  Expected bytes, got a 'int' object
Attempting non-optimization as 'spark.sql.execution.arrow.pyspark.fallback.enabled' is set to true.
  warn(msg)
```

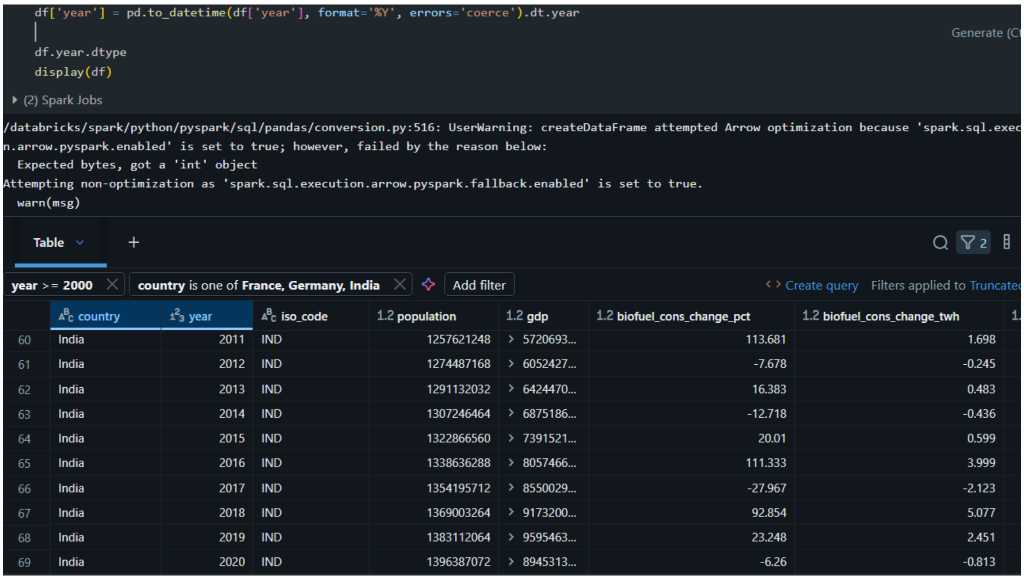
Table +

year >= 2000 | country is one of France, Germany, India | Add filter | Create query | Filters applied to Truncated

	country	year	iso_code	population	gdp	biofuel_cons_change_pct	biofuel_cons_change_twh
60	India	2011	IND	1257621248	5720693...	113.681	1.698
61	India	2012	IND	1274487168	6052427...	-7.678	-0.245
62	India	2013	IND	1291132032	6424470...	16.383	0.483
63	India	2014	IND	1307246464	6875186...	-12.718	-0.436
64	India	2015	IND	1322866560	7391521...	20.01	0.599
65	India	2016	IND	1338636288	8057466...	111.333	3.999
66	India	2017	IND	1354195712	8550029...	-27.967	-2.123
67	India	2018	IND	1369003264	9173200...	92.854	5.077
68	India	2019	IND	1383112064	9595463...	23.248	2.451
69	India	2020	IND	1396387072	8945313...	-6.26	-0.813

Filter for specific conditions

You can use built-in table filters to filter your columns for specific conditions. There are several ways to create a filter.




```
df['year'] = pd.to_datetime(df['year'], format='%Y', errors='coerce').dt.year

df.year.dtype
display(df)
```

Generate (C

(2) Spark Jobs

```
/databricks/spark/python/pyspark/sql/pandas/conversion.py:516: UserWarning: createDataFrame attempted Arrow optimization because 'spark.sql.exec
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Table +

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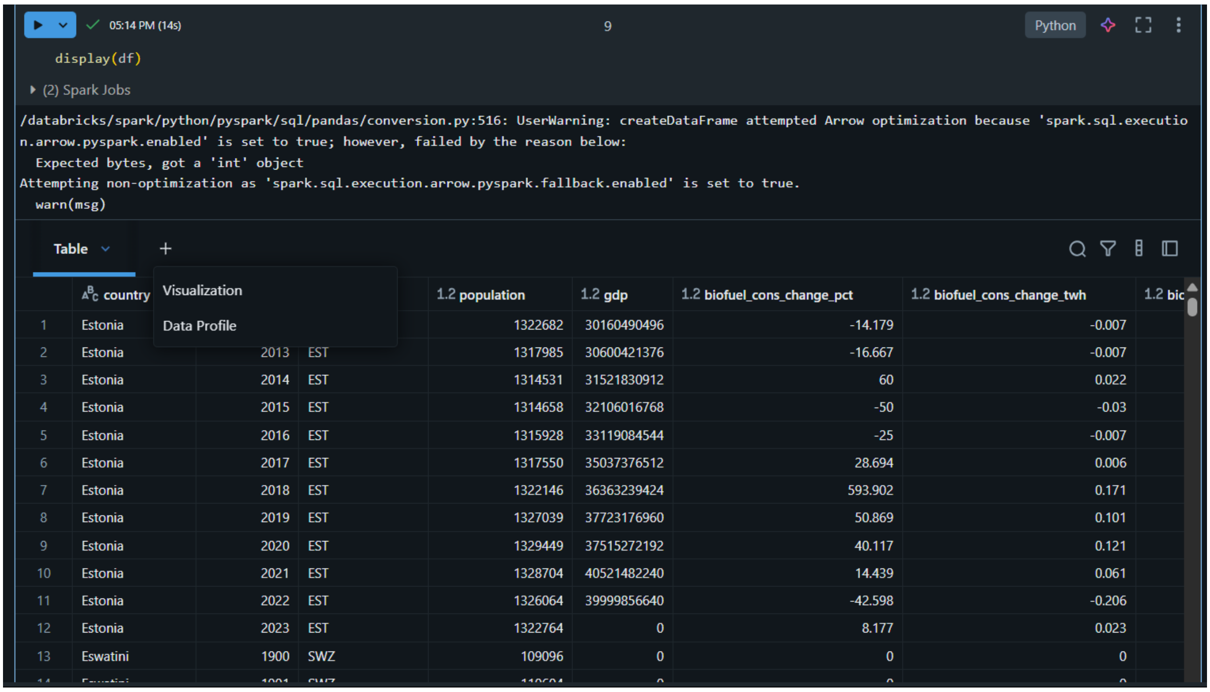
Create visualizations using the dataset

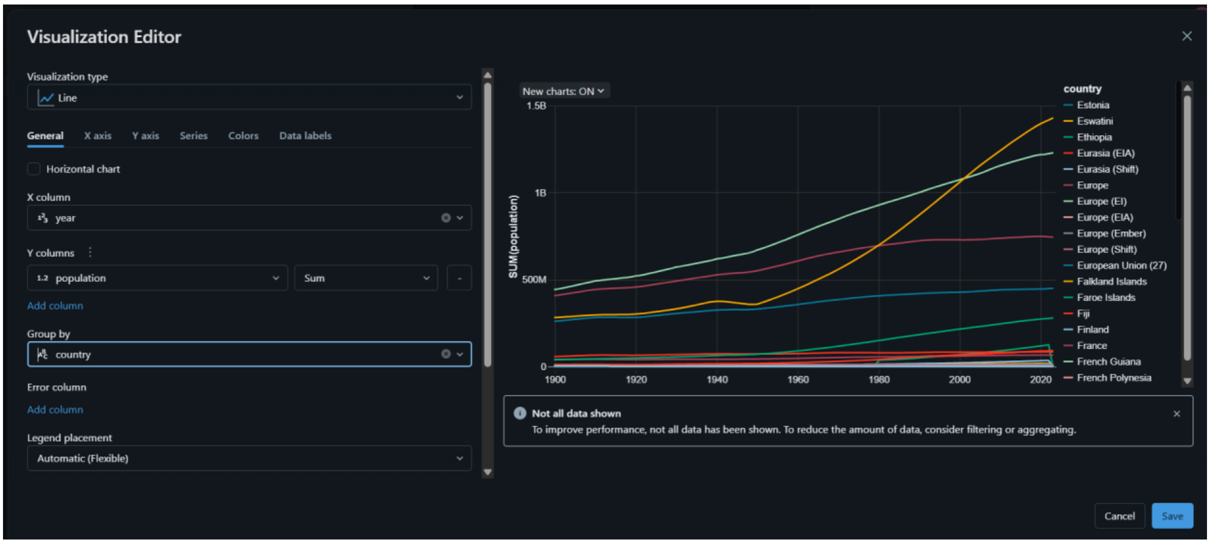
At the top of the output table, click + > **Visualization** to open the visualization editor.



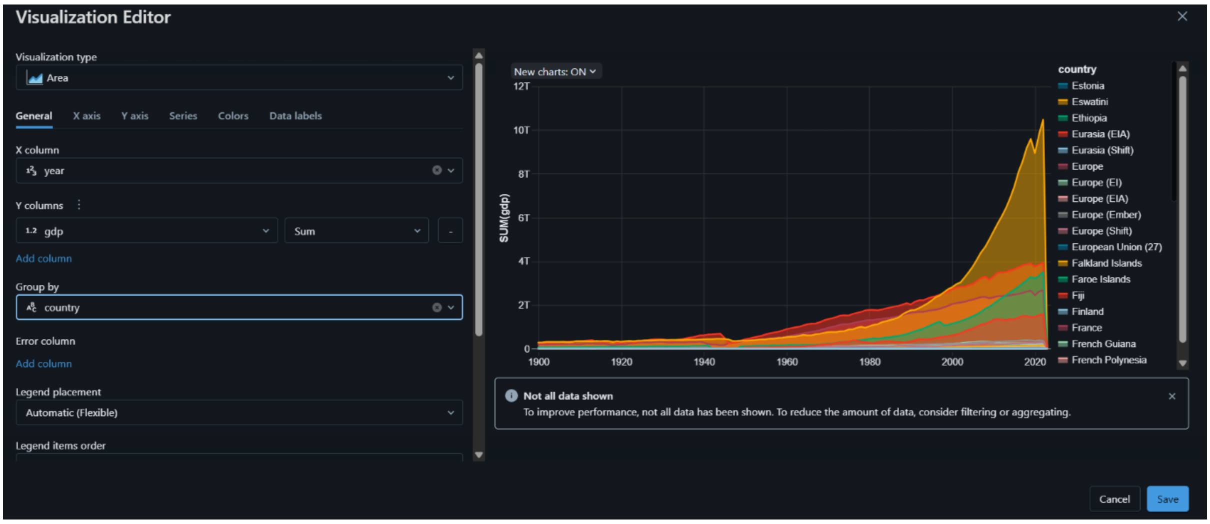
Visualization

Select the visualization type and columns you'd like to visualize. The editor displays a preview of the chart based on your configuration

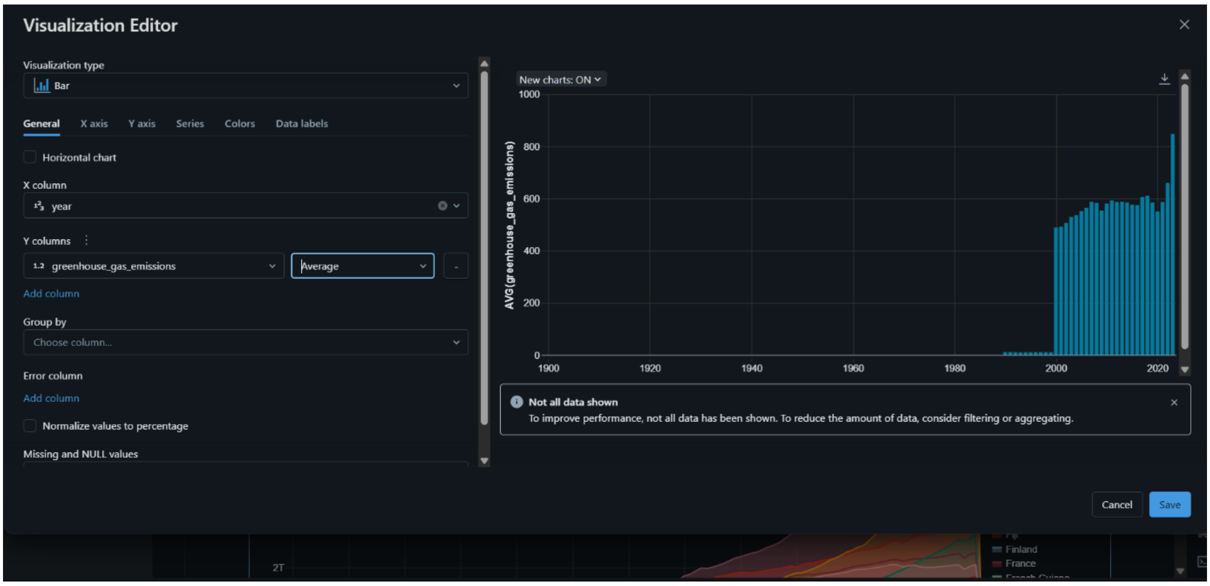
Line Chart



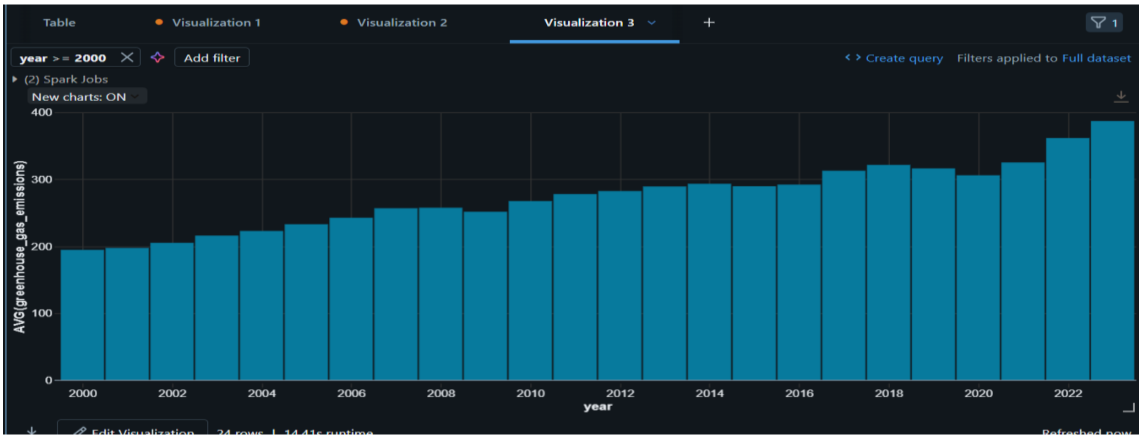
Area Chart



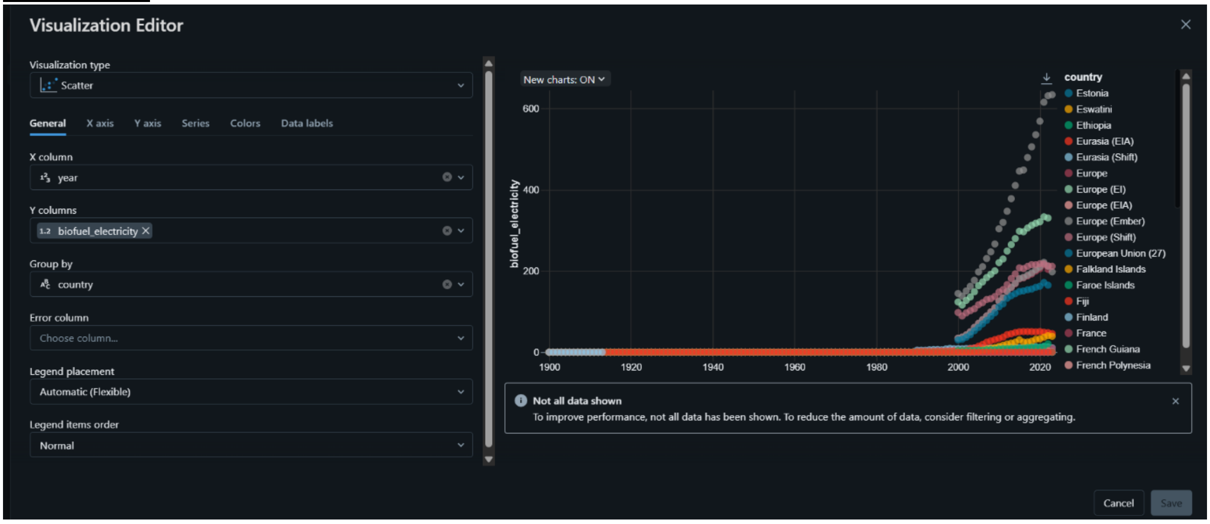
Bar Chart



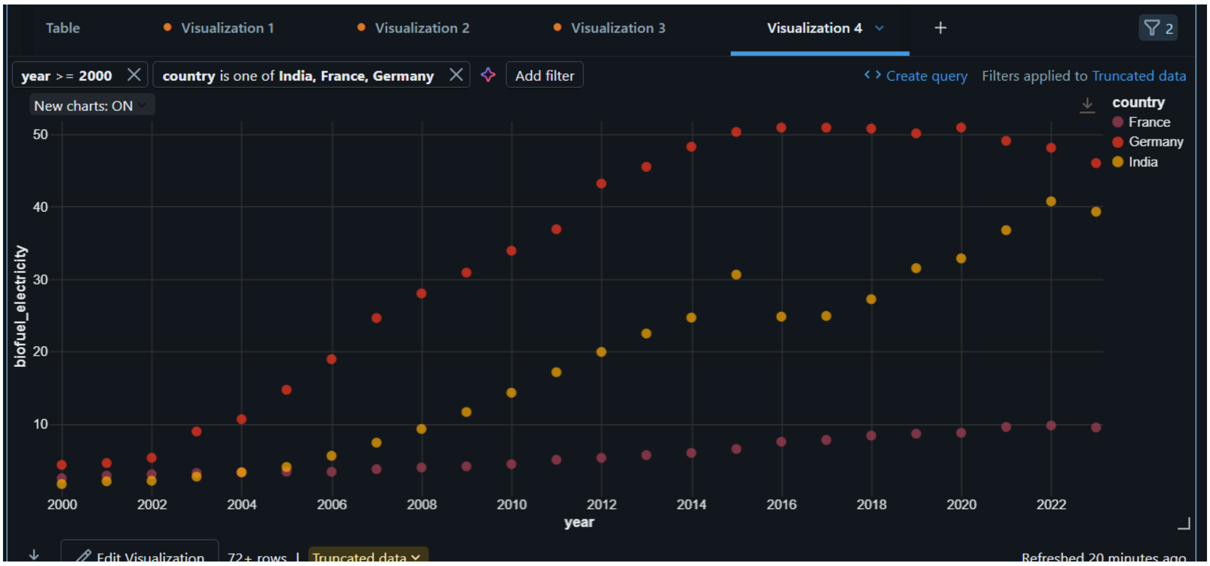
Bar Chart with Filters



Scatter Plot



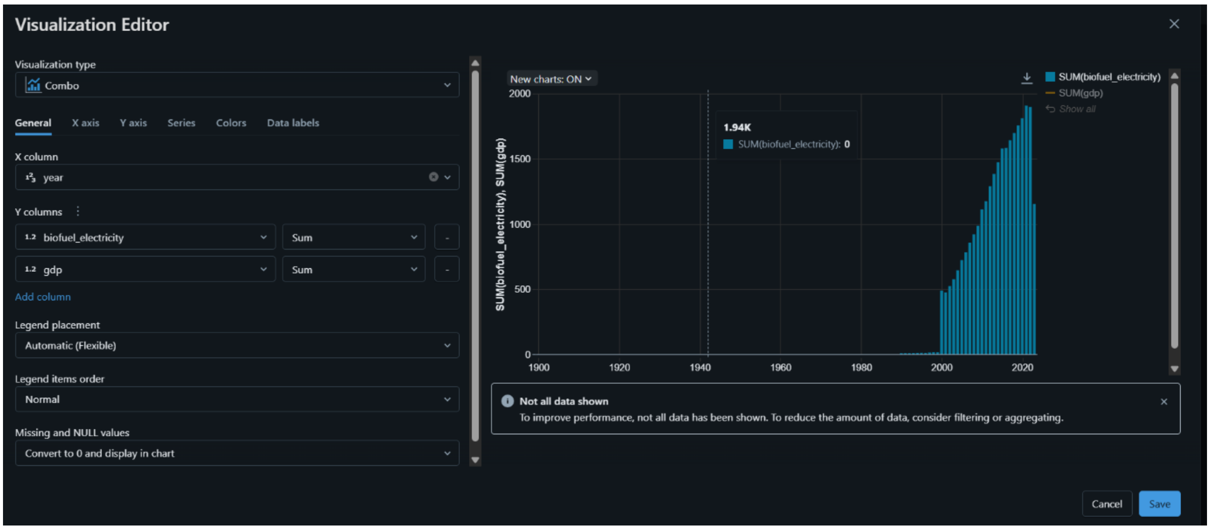
Scatter Plot with Filters



Heatmap

Heatmap with Filters

Combo Chart


Visualization Editor
Visualization type
Combo
General
X axis
Y axis
Series
Colors
Data labels
X column
year
Y columns
biofuel_electricity
Sum
gdp
Sum
Add column
Legend placement
Automatic (Flexible)
Legend items order
Normal
Missing and NULL values
Convert to 0 and display in chart
New charts: ON
SUM(biofuel_electricity)
SUM(gdp)
Show all
1.94K
SUM(biofuel_electricity): 0
SUM(biofuel_electricity), SUM(gdp)
2000
1500
1000
500
0
1900
1920
1940
1960
1980
2000
2020
Not all data shown
To improve performance, not all data has been shown. To reduce the amount of data, consider filtering or aggregating.
Cancel
Save