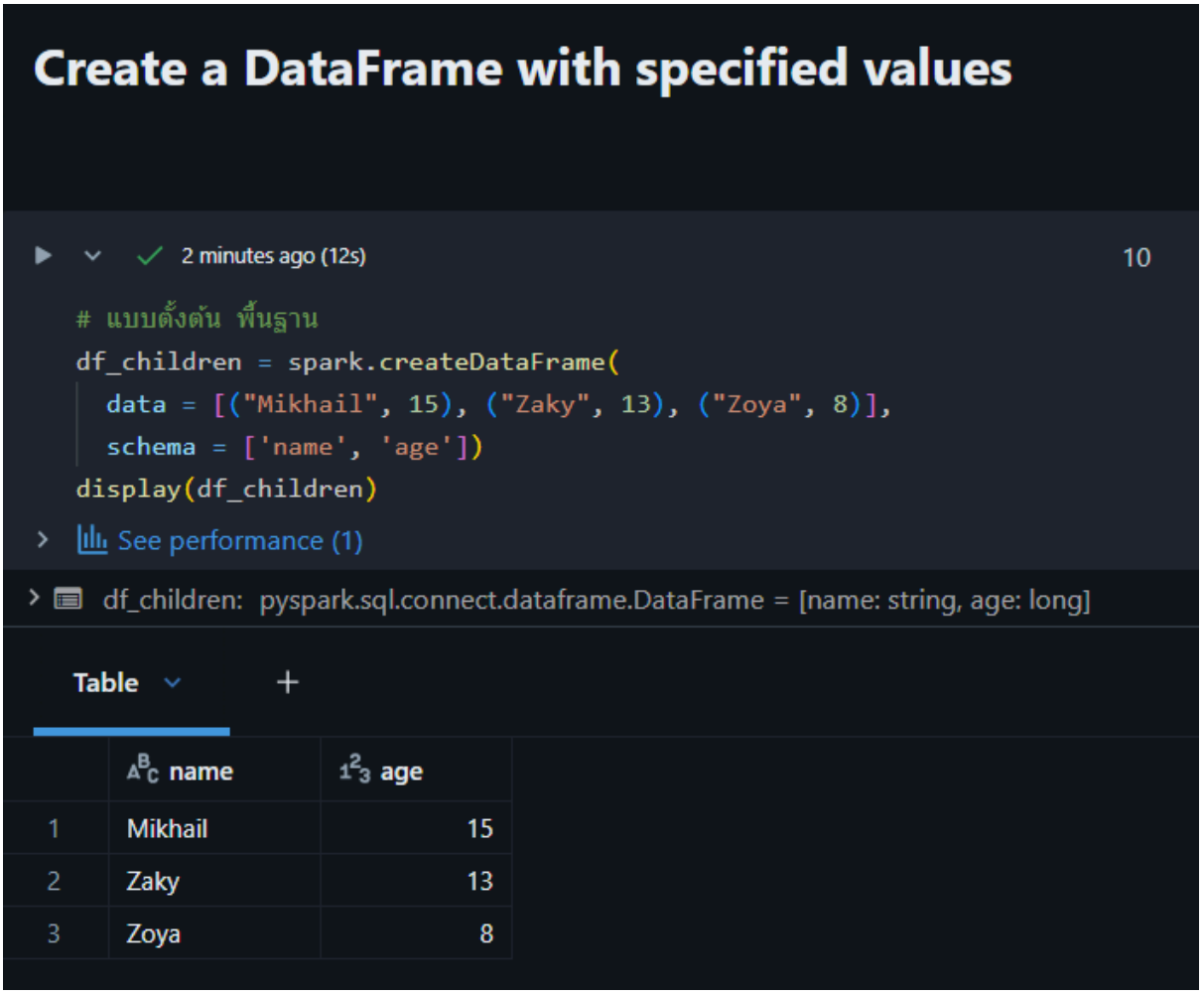
PySpark Basics Result

ผลลัพธ์จากการ run ในไฟล์ PySpark Basics จะรวบรวมไว้ในนี้ สามารถคลิกดูตามหัวข้อได้ *(ในแอพ docs คลิก 3 จุดขวาบน > Document Outline)* บางหัวข้อที่ไม่ได้มีผลลัพธ์จะไม่ได้ปรากฏในนี้

Create a DataFrame

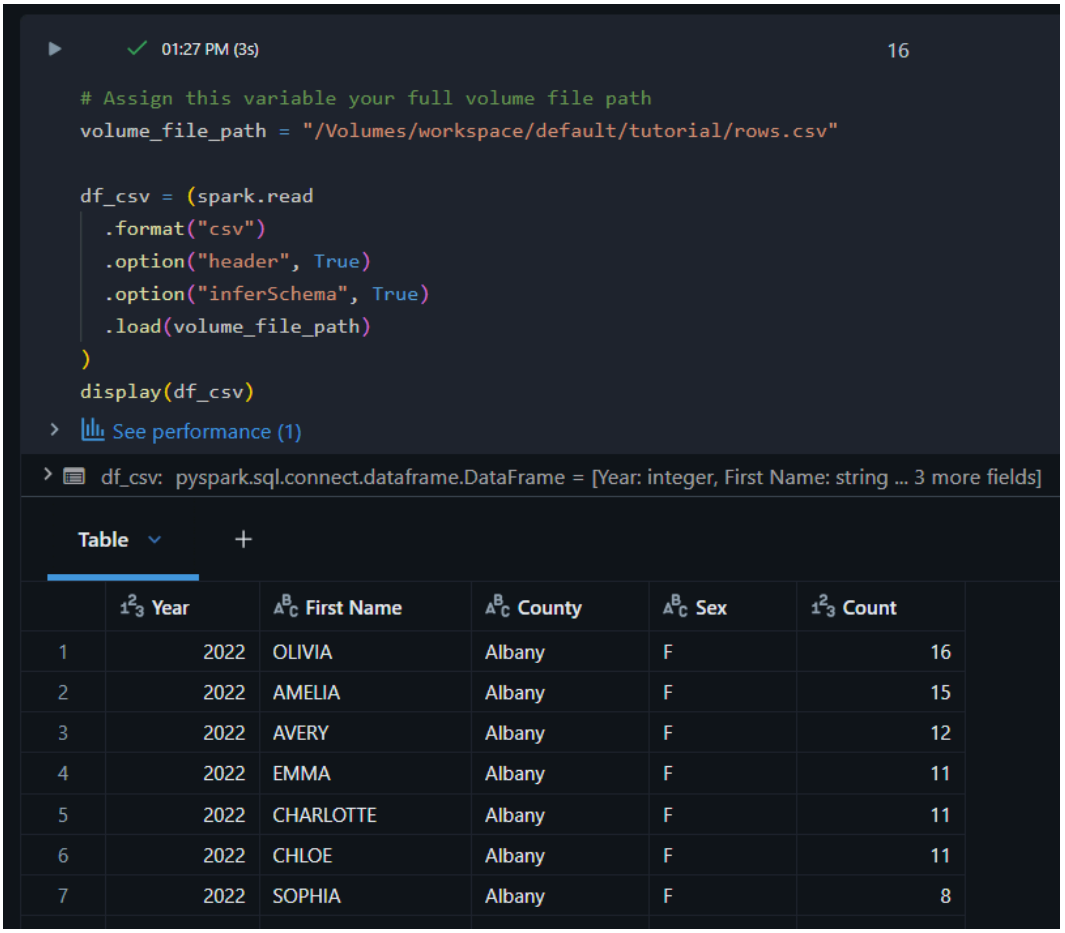
Create a DataFrame with specified values



Create a DataFrame from a table in Unity Catalog

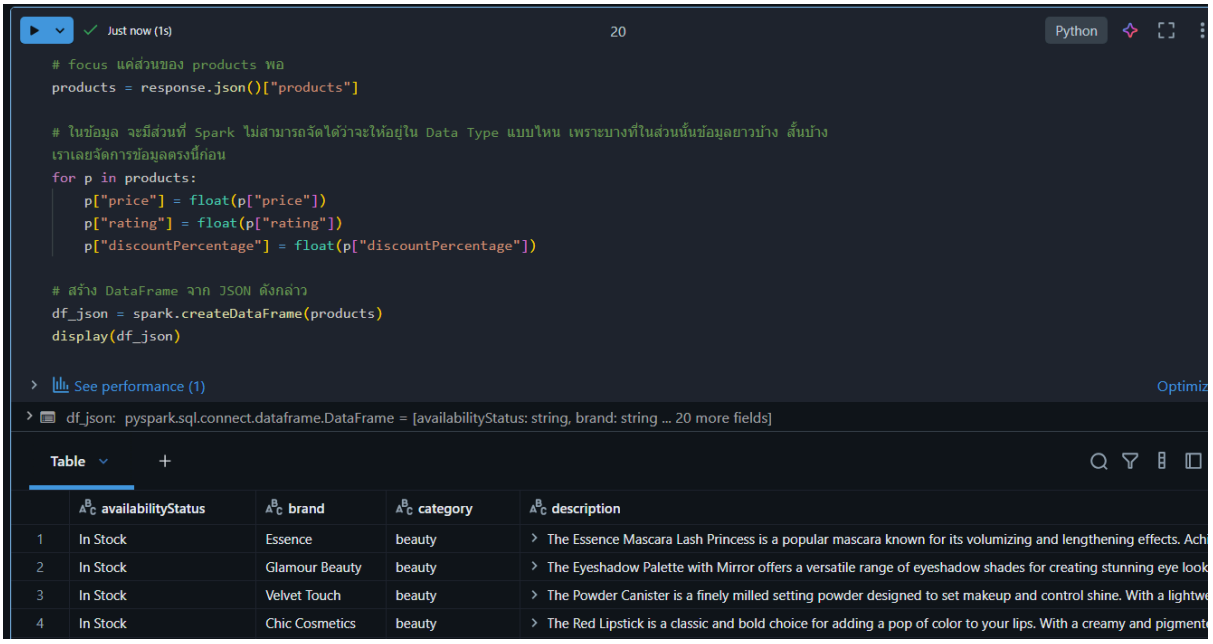
	c_custkey	c_name	c_address	c_nationkey	c_phone	c_acctbal	c_mktsegm
1	412445	Customer#0004124...	0QAB3OjYnbP6mA0B,kgf	21	31-421-403-4333	5358.33	BUILDING
2	412446	Customer#0004124...	5u8MSbyiC7J,7PuY4lvaq1JRbTCMKeNVqg	20	30-487-949-7942	9441.59	MACHINERY
3	412447	Customer#0004124...	HC4ZT62gKPgrjr ceoaZgFOunlUogr7GO	7	17-797-466-6308	7868.75	AUTOMOBILE
4	412448	Customer#0004124...	hJok1MMrDgH	6	16-541-510-4964	6060.98	MACHINERY
5	412449	Customer#0004124...	zAt1nZNG01gOhlqgyDtDa S,Y0VSofZJs1dd	14	24-710-983-5536	4973.84	HOUSEHOLD
6	412450	Customer#0004124...	fUD6loGdtF	20	30-293-696-5047	4406.28	BUILDING
7	412451	Customer#0004124...	W2Ge0Qd8adH	20	30-590-724-6711	2290.38	BUILDING
8	412452	Customer#0004124...	lj4xiPleNEP1uR5p7H	10	20-492-590-3363	3426.64	AUTOMOBILE

Create a DataFrame from an uploaded file



	Year	First Name	County	Sex	Count
1	2022	OLIVIA	Albany	F	16
2	2022	AMELIA	Albany	F	15
3	2022	AVERY	Albany	F	12
4	2022	EMMA	Albany	F	11
5	2022	CHARLOTTE	Albany	F	11
6	2022	CHLOE	Albany	F	11
7	2022	SOPHIA	Albany	F	8

Create a DataFrame from a JSON response



```
# focus แค่ส่วนของ products พอ
products = response.json()["products"]

# ในข้อมูล จะมีส่วนที่ Spark ไม่สามารถจัดได้ว่าจะให้อยู่ใน Data Type แบบไหน เพราะบางที่ในส่วนนั้นข้อมูลยาวบ้าง สั้นบ้าง
เราเลยจัดการข้อมูลตรงนี้ก่อน
for p in products:
    p["price"] = float(p["price"])
    p["rating"] = float(p["rating"])
    p["discountPercentage"] = float(p["discountPercentage"])

# สร้าง DataFrame จาก JSON ดังกล่าว
df_json = spark.createDataFrame(products)
display(df_json)
```

Just now (1s) 20 Python

See performance (1) Optimiz

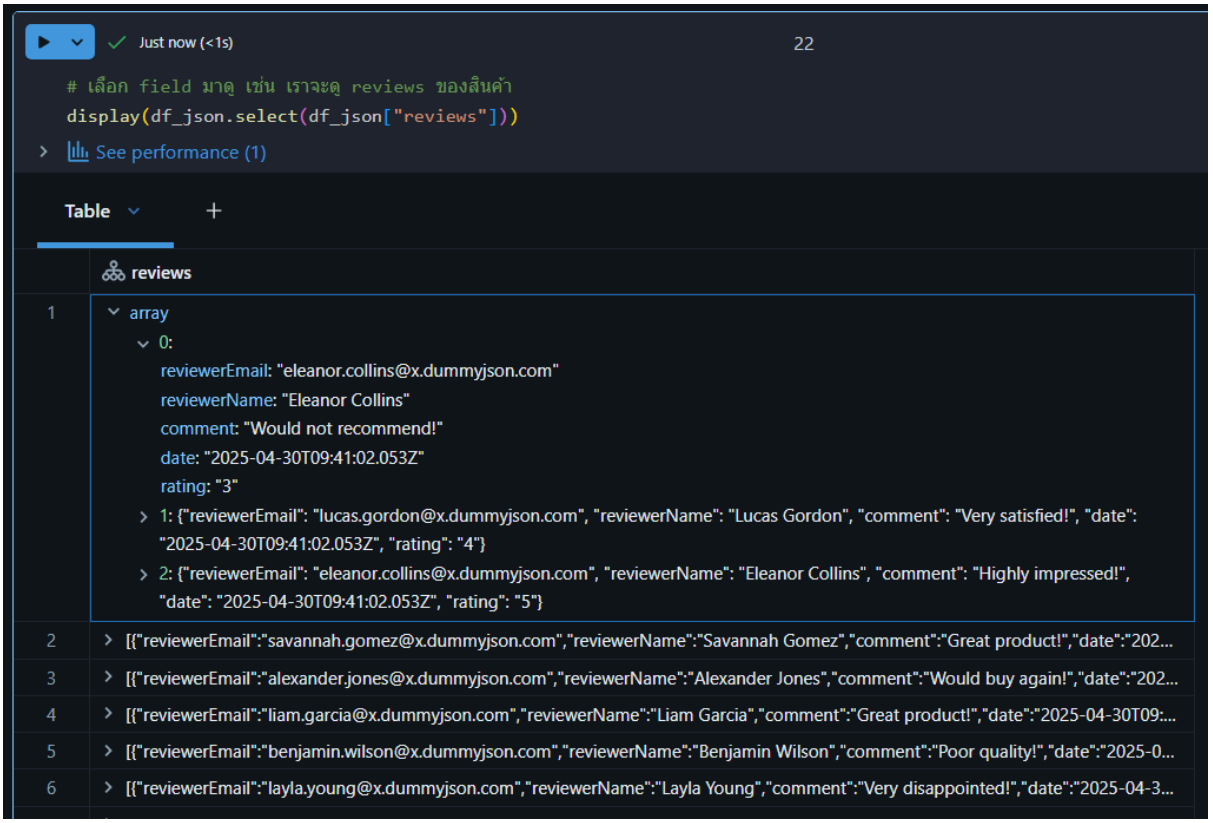
df_json: pyspark.sql.connect.dataframe.DataFrame = [availabilityStatus: string, brand: string ... 20 more fields]

Table +

	availabilityStatus	brand	category	description
1	In Stock	Essence	beauty	The Essence Mascara Lash Princess is a popular mascara known for its volumizing and lengthening effects. Ach
2	In Stock	Glamour Beauty	beauty	The Eyeshadow Palette with Mirror offers a versatile range of eyeshadow shades for creating stunning eye look
3	In Stock	Velvet Touch	beauty	The Powder Canister is a finely milled setting powder designed to set makeup and control shine. With a lightwe
4	In Stock	Chic Cosmetics	beauty	The Red Lipstick is a classic and bold choice for adding a pop of color to your lips. With a creamy and pigment

(30 rows)

Select a JSON field or object



```
# เลือก field มาดู เช่น เราจะดู reviews ของสินค้า
display(df_json.select(df_json["reviews"]))
```

Just now (<1s) 22

See performance (1)

Table +

reviews

1 array
- 0:
  - reviewerEmail: "eleanor.collins@x.dummyjson.com"
  - reviewerName: "Eleanor Collins"
  - comment: "Would not recommend!"
  - date: "2025-04-30T09:41:02.053Z"
  - rating: "3"
- 1: {"reviewerEmail": "lucas.gordon@x.dummyjson.com", "reviewerName": "Lucas Gordon", "comment": "Very satisfied!", "date": "2025-04-30T09:41:02.053Z", "rating": "4"}
- 2: {"reviewerEmail": "eleanor.collins@x.dummyjson.com", "reviewerName": "Eleanor Collins", "comment": "Highly impressed!", "date": "2025-04-30T09:41:02.053Z", "rating": "5"}

2 [{"reviewerEmail":"savannah.gomez@x.dummyjson.com","reviewerName":"Savannah Gomez","comment":"Great product!","date":"202...

3 [{"reviewerEmail":"alexander.jones@x.dummyjson.com","reviewerName":"Alexander Jones","comment":"Would buy again!","date":"202...

4 [{"reviewerEmail":"liam.garcia@x.dummyjson.com","reviewerName":"Liam Garcia","comment":"Great product!","date":"2025-04-30T09:...

5 [{"reviewerEmail":"benjamin.wilson@x.dummyjson.com","reviewerName":"Benjamin Wilson","comment":"Poor quality!","date":"2025-0...

6 [{"reviewerEmail":"layla.young@x.dummyjson.com","reviewerName":"Layla Young","comment":"Very disappointed!","date":"2025-04-3...

1 minute ago (1s) 23

```
# เลือก reviewerName ที่อยู่ใน index ที่ 1 ของรีวิวทั้งหมด ในสินค้าแต่ละชิ้น
display(df_json.select(
        df_json["reviews"][1]["reviewerName"],
        df_json["reviews"][1]["rating"],
        df_json["reviews"][1]["comment"]
    ))
```

See performance (1)

Table +

	reviews[1][reviewerName]	reviews[1][rating]	reviews[1][comment]
1	Lucas Gordon	4	Very satisfied!
2	Christian Perez	4	Awesome product!
3	Elijah Cruz	5	Highly impressed!
4	Ruby Andrews	5	Great product!
5	Liam Smith	5	Great product!
6	Daniel Cook	4	Fast shipping!
7	Leah Henderson	5	Awesome product!
8	Penelope Harper	4	Great value for money!
9	Nolan Gonzalez	4	Highly recommended!
10	Daniel Cook	5	Very happy with my purchase!

Create a DataFrame from a file

Create a DataFrame from a file

2 minutes ago (1s) 25 Python

```
# ดูว่าใน DataBricks มี Sample data อะไรให้บ้าง

display(dbutils.fs.ls('/databricks-datasets'))
```

See performance (2)

Table +

	path	name	size	modificationTime
1	dbfs:/databricks-datasets/COVID/	COVID/	0	1765694991640
2	dbfs:/databricks-datasets/README.md	README.md	976	1596557781000
3	dbfs:/databricks-datasets/Rdatasets/	Rdatasets/	0	1765694991640
4	dbfs:/databricks-datasets/SPARK_README.md	SPARK_README.md	3359	1596557823000
5	dbfs:/databricks-datasets/adult/	adult/	0	1765694991640
6	dbfs:/databricks-datasets/airlines/	airlines/	0	1765694991641
7	dbfs:/databricks-datasets/amazon/	amazon/	0	1765694991641

หรือจะใช้วิธีอีกแบบคือ Databricks CLI file system commands

5 minutes ago (1s) 28

```
%fs ls '/databricks-datasets'
```

See performance (2)

Table +

	path	name	size	modificationTime
1	dbfs:/databricks-datasets/COVID/	COVID/	0	1765694992444
2	dbfs:/databricks-datasets/README.md	README.md	976	1596557781000
3	dbfs:/databricks-datasets/Rdatasets/	Rdatasets/	0	1765694992444
4	dbfs:/databricks-datasets/SPARK_README.md	SPARK_README.md	3359	1596557823000
5	dbfs:/databricks-datasets/adult/	adult/	0	1765694992444

(ผลลัพธ์เหมือนกัน)

01:49 PM (2s) 29

```
df_population = (spark.read
  .format("csv")
  .option("header", True)
  .option("inferSchema", True)
  .load("/databricks-datasets/samples/population-vs-price/data_geo.csv")
)
display(df_population)
```

See performance (1) Optimize

df_population: pyspark.sql.connect.dataframe.DataFrame = [2014 rank: integer, City: string ... 4 more fields]

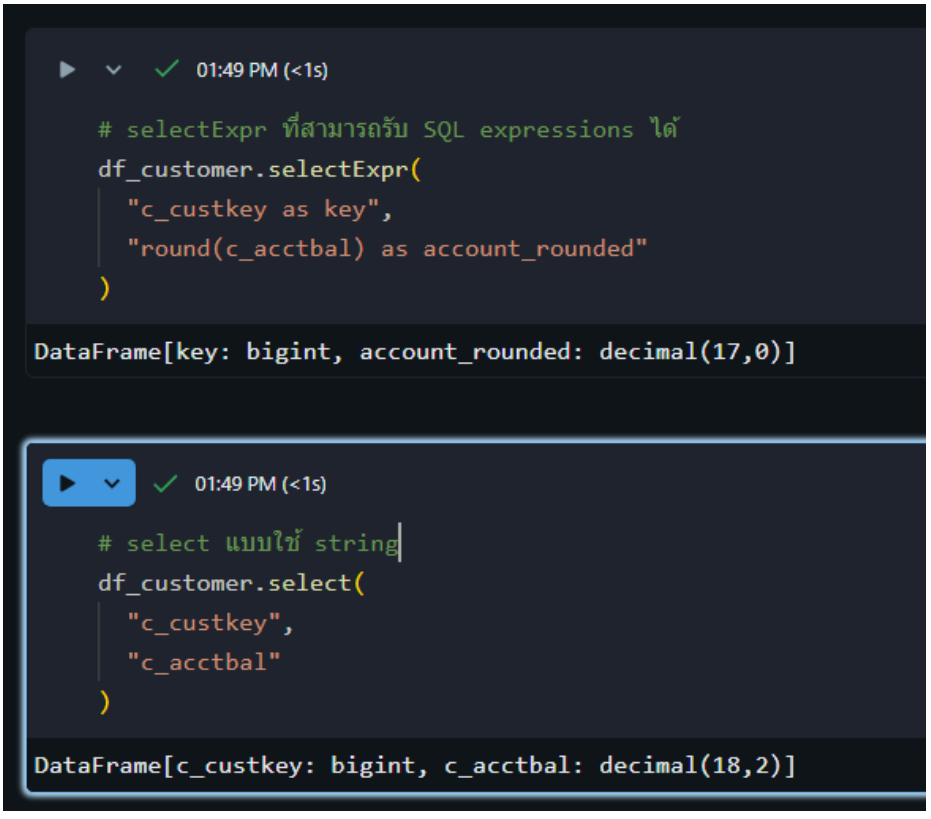
Table +

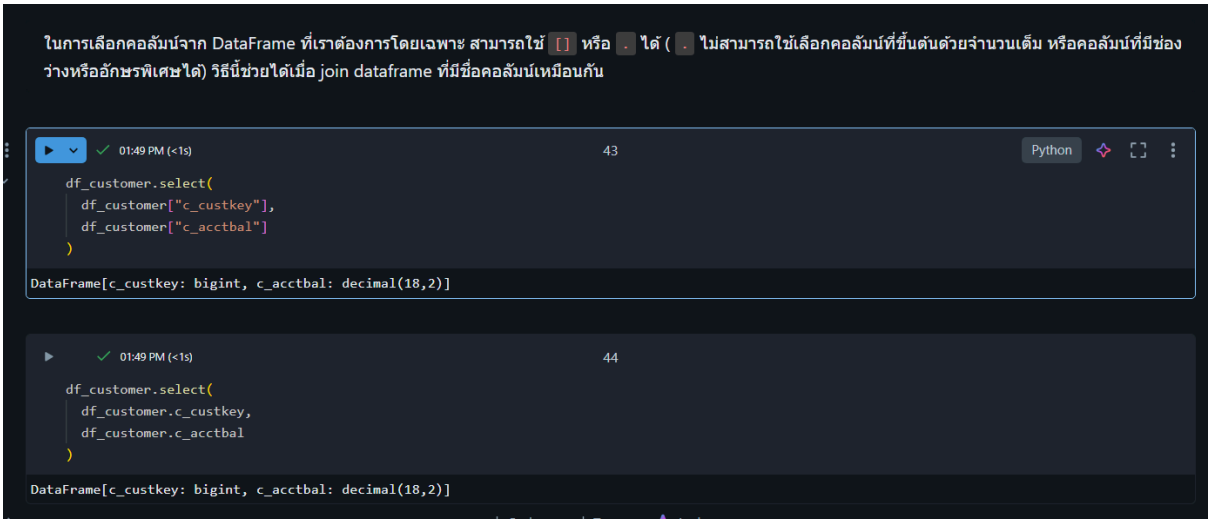
	2014 rank	City	State	State Code	2014 Population estimate	2015 median sales price
1	101	Birmingham	Alabama	AL	212247	162.9
2	125	Huntsville	Alabama	AL	188226	157.7
3	122	Mobile	Alabama	AL	194675	122.5
4	114	Montgomery	Alabama	AL	200481	129
5	64	Anchorage[19]	Alaska	AK	301010	null
6	78	Chandler	Arizona	AZ	254276	null
7	86	Gilbert[20]	Arizona	AZ	239277	null
8	88	Glendale	Arizona	AZ	237517	null
9	38	Mesa	Arizona	AZ	464704	null
10	148	Peoria	Arizona	AZ	166934	null

Transform data with DataFrames

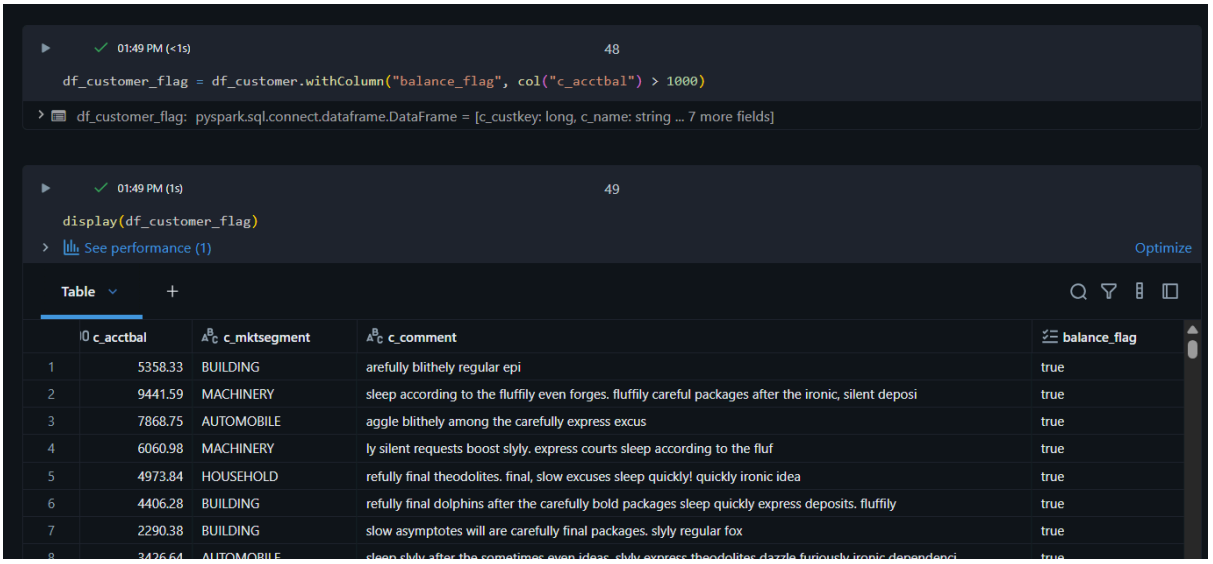
Column operations

Select columns



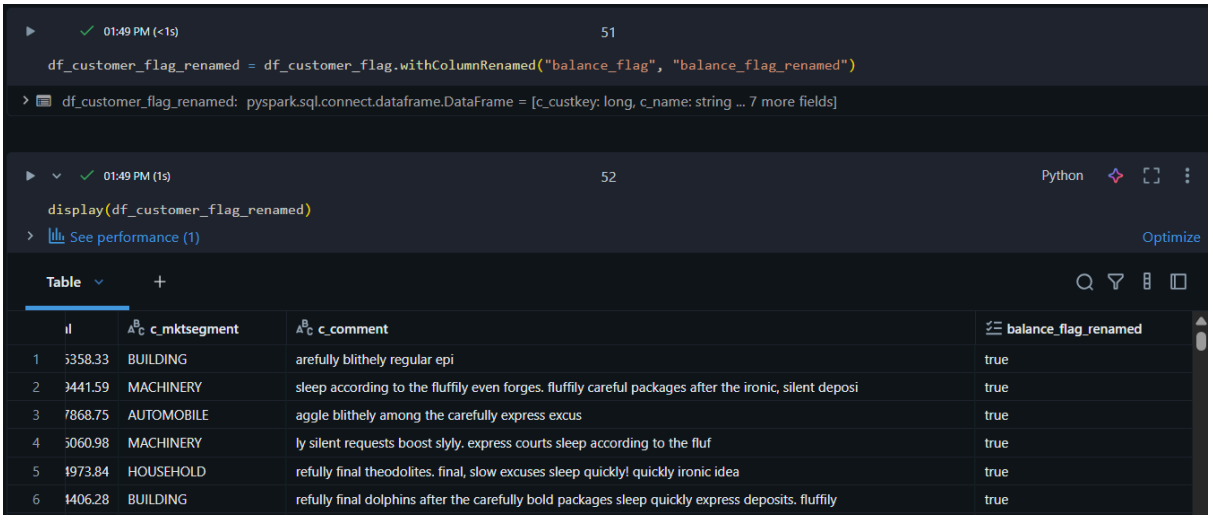


Create columns



	c_acctbal	c_mktsegment	c_comment	balance_flag
1	5358.33	BUILDING	arefully blithely regular epi	true
2	9441.59	MACHINERY	sleep according to the fluffily even forges. fluffily careful packages after the ironic, silent deposi	true
3	7868.75	AUTOMOBILE	aggle blithely among the carefully express excus	true
4	6060.98	MACHINERY	ly silent requests boost slyly. express courts sleep according to the fluf	true
5	4973.84	HOUSEHOLD	refully final theodolites. final, slow excuses sleep quickly! quickly ironic idea	true
6	4406.28	BUILDING	refully final dolphins after the carefully bold packages sleep quickly express deposits. fluffily	true
7	2290.38	BUILDING	slow asymptotes will are carefully final packages. slyly regular fox	true
8	3426.64	AUTOMOBILE	sleep slyly after the sometimes even ideas. slyly express theodolites dazzle furiously ironic dependenci	true

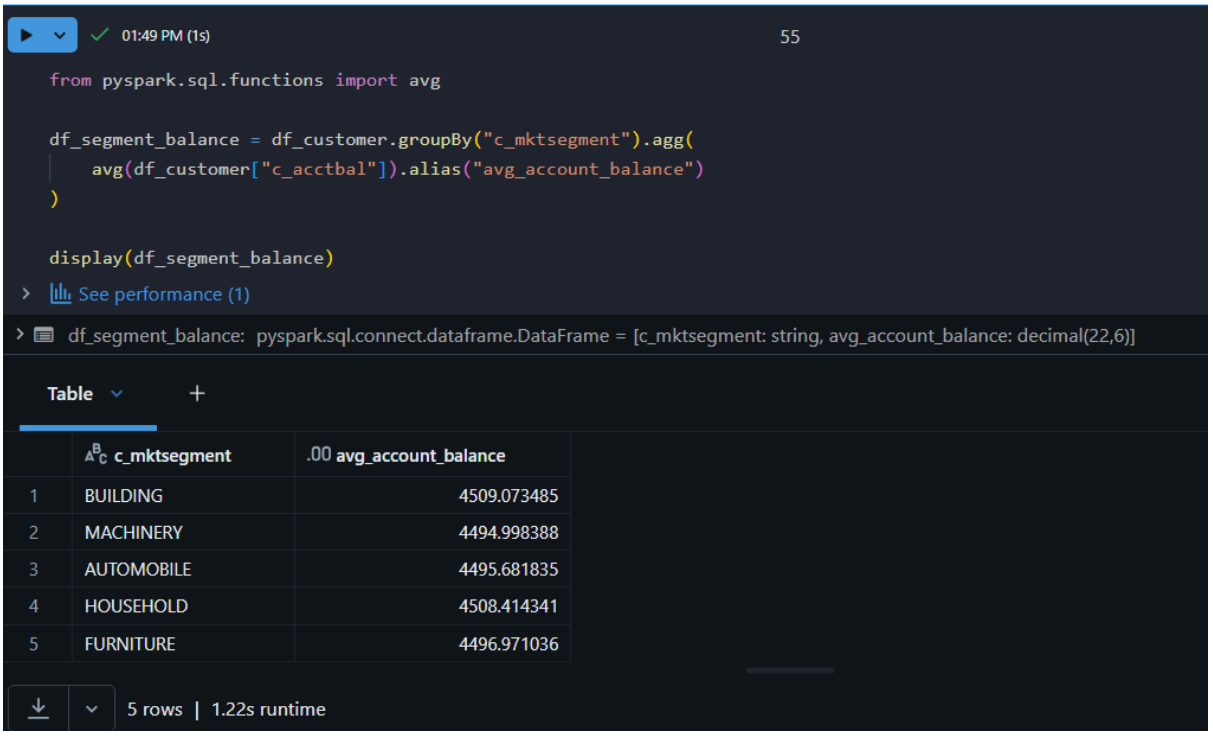
Rename columns



```
01:49 PM (<1s)  51
df_customer_flag_renamed = df_customer_flag.withColumnRenamed("balance_flag", "balance_flag_renamed")
df_customer_flag_renamed:  pyspark.sql.connect.dataframe.DataFrame = [c_custkey: long, c_name: string ... 7 more fields]

01:49 PM (1s)  52  Python
display(df_customer_flag_renamed)
See performance (1)  Optimize
```

Table

	il	c_mktsegment	c_comment	balance_flag_renamed
1	5358.33	BUILDING	arefully blithely regular epi	true
2	9441.59	MACHINERY	sleep according to the fluffily even forges. fluffily careful packages after the ironic, silent deposi	true
3	7868.75	AUTOMOBILE	aggle blithely among the carefully express excus	true
4	5060.98	MACHINERY	ly silent requests boost slyly. express courts sleep according to the fluf	true
5	1973.84	HOUSEHOLD	refully final theodolites. final, slow excuses sleep quickly! quickly ironic idea	true
6	1406.28	BUILDING	refully final dolphins after the carefully bold packages sleep quickly express deposits. fluffily	true



```
01:49 PM (1s)  55
from pyspark.sql.functions import avg

df_segment_balance = df_customer.groupBy("c_mktsegment").agg(
    avg(df_customer["c_acctbal"]).alias("avg_account_balance")
)

display(df_segment_balance)
See performance (1)
df_segment_balance:  pyspark.sql.connect.dataframe.DataFrame = [c_mktsegment: string, avg_account_balance: decimal(22,6)]
```

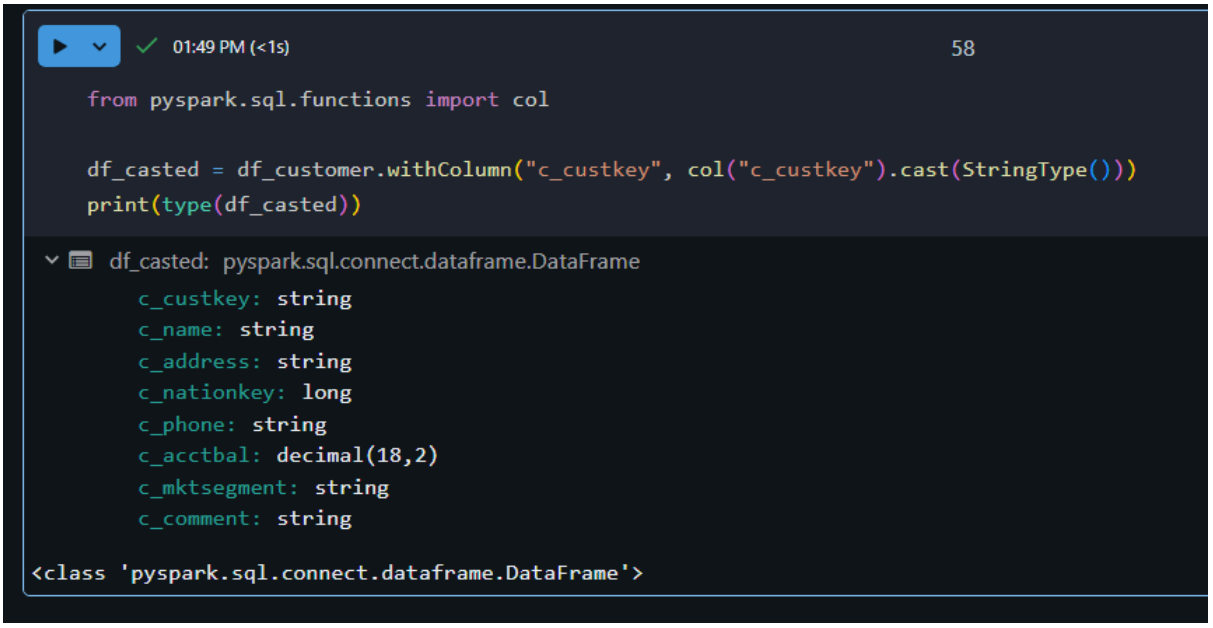
Table

	c_mktsegment	.00 avg_account_balance
1	BUILDING	4509.073485
2	MACHINERY	4494.998388
3	AUTOMOBILE	4495.681835
4	HOUSEHOLD	4508.414341
5	FURNITURE	4496.971036

5 rows | 1.22s runtime

^ ภาพบนนี้คือผลจากการเปลี่ยนชื่อของคอลัมน์ที่มาจากการทำ aggregate

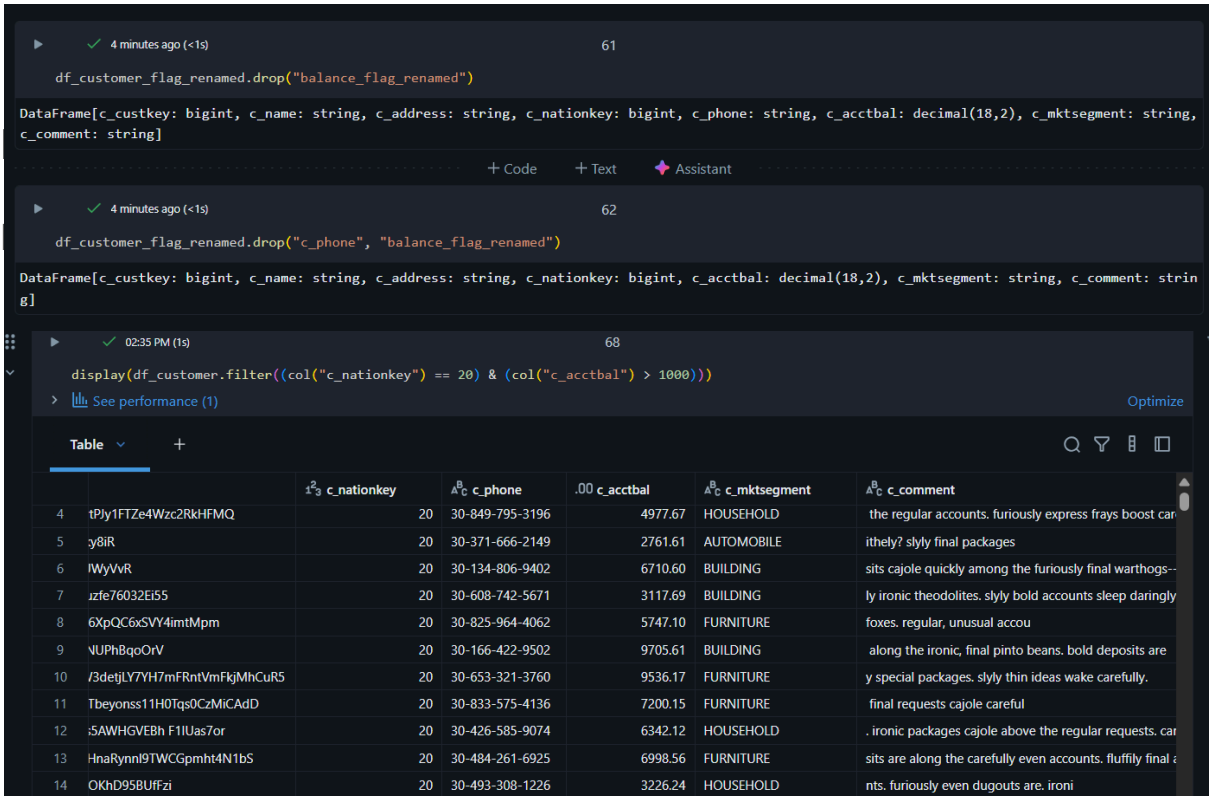
Cast column types



```
01:49 PM (<1s)                                                    58

from pyspark.sql.functions import col

df_casted = df_customer.withColumn("c_custkey", col("c_custkey").cast(StringType()))
print(type(df_casted))
```

```
df_casted: pyspark.sql.connect.dataframe.DataFrame
    c_custkey: string
    c_name: string
    c_address: string
    c_nationkey: long
    c_phone: string
    c_acctbal: decimal(18,2)
    c_mktsegment: string
    c_comment: string

<class 'pyspark.sql.connect.dataframe.DataFrame'>
```

Remove columns



```
4 minutes ago (<1s)                                               61

df_customer_flag_renamed.drop("balance_flag_renamed")
```

```
DataFrame[c_custkey: bigint, c_name: string, c_address: string, c_nationkey: bigint, c_phone: string, c_acctbal: decimal(18,2), c_mktsegment: string,
c_comment: string]
```

+ Code + Text Assistant

```
4 minutes ago (<1s)                                               62

df_customer_flag_renamed.drop("c_phone", "balance_flag_renamed")
```

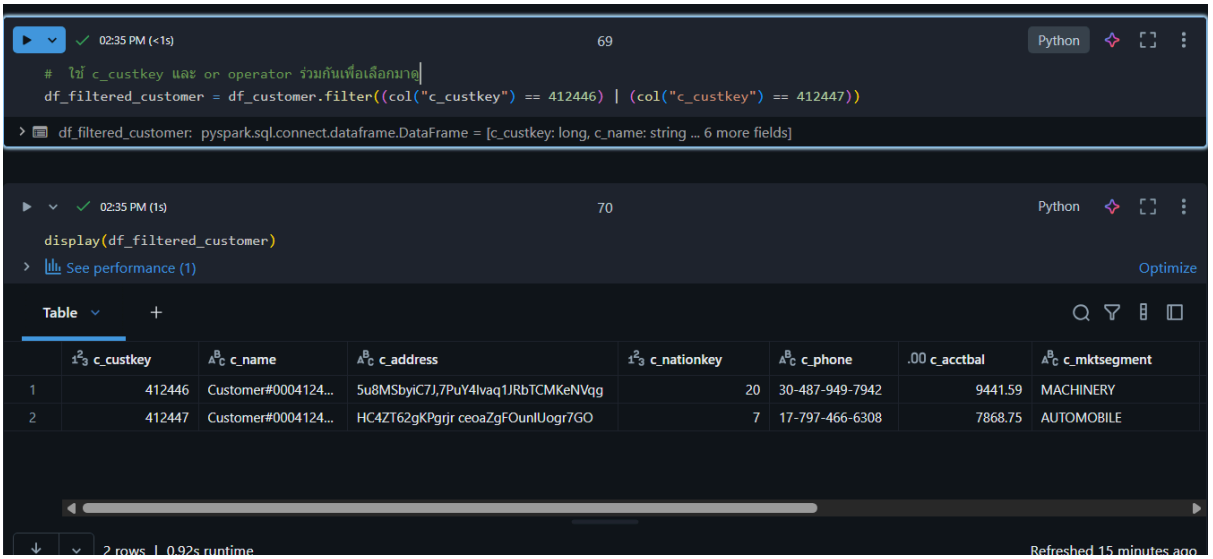
```
DataFrame[c_custkey: bigint, c_name: string, c_address: string, c_nationkey: bigint, c_acctbal: decimal(18,2), c_mktsegment: string, c_comment: strin
g]
```

```
02:35 PM (1s)                                                     68

display(df_customer.filter((col("c_nationkey") == 20) & (col("c_acctbal") > 1000)))
```

See performance (1) Optimize

Table +

	c_custkey	c_nationkey	c_phone	c_acctbal	c_mktsegment	c_comment
4	tPJy1FTZe4Wzc2RkHFMQ	20	30-849-795-3196	4977.67	HOUSEHOLD	the regular accounts. furiously express frays boost car
5	y8iR	20	30-371-666-2149	2761.61	AUTOMOBILE	ithely? slyly final packages
6	lWyVvR	20	30-134-806-9402	6710.60	BUILDING	sits cajole quickly among the furiously final warthogs--
7	zfe76032Ei55	20	30-608-742-5671	3117.69	BUILDING	ly ironic theodolites. slyly bold accounts sleep daringly
8	6XpQC6xSVY4imtMpm	20	30-825-964-4062	5747.10	FURNITURE	foxes. regular, unusual accou
9	\UPhBqoOrV	20	30-166-422-9502	9705.61	BUILDING	along the ironic, final pinto beans. bold deposits are
10	/3detjLY7YH7mFRntVmFkjMhCuR5	20	30-653-321-3760	9536.17	FURNITURE	y special packages. slyly thin ideas wake carefully.
11	Tbeyonss11H0Tqs0CzMiCAdD	20	30-833-575-4136	7200.15	FURNITURE	final requests cajole careful
12	:5AWHGVEBh F1IUas7or	20	30-426-585-9074	6342.12	HOUSEHOLD	. ironic packages cajole above the regular requests. car
13	HnaRynnl9TWCGpmht4N1bS	20	30-484-261-6925	6998.56	FURNITURE	sits are along the carefully even accounts. fluffily final
14	OKhD95BUffZi	20	30-493-308-1226	3226.24	HOUSEHOLD	nts. furiously even dugouts are. ironi


02:35 PM (<1s)
69
Python
# ใช้ c_custkey และ or operator ร่วมกันเพื่อเลือกมาดู
df_filtered_customer = df_customer.filter((col("c_custkey") == 412446) | (col("c_custkey") == 412447))
df_filtered_customer: pyspark.sql.connect.dataframe.DataFrame = [c_custkey: long, c_name: string ... 6 more fields]
02:35 PM (1s)
70
Python
display(df_filtered_customer)
See performance (1)
Optimize
Table
c_custkey
c_name
c_address
c_nationkey
c_phone
c_acctbal
c_mktsegment
1 412446 Customer#0004124... 5u8MSbyiC7J,7PuY4Ivaq1JRbTCMKeNVqg 20 30-487-949-7942 9441.59 MACHINERY
2 412447 Customer#0004124... HC4ZT62gKPgrjr ceoaZgFOunlUogr7GO 7 17-797-466-6308 7868.75 AUTOMOBILE
2 rows | 0.92s runtime
Refreshed 15 minutes ago

Append rows


02:35 PM (1s)
87
Python
df_appended_rows = df_that_one_customer.union(df_filtered_customer)
display(df_appended_rows)
See performance (1)
Optimize
df_appended_rows: pyspark.sql.connect.dataframe.DataFrame = [c_custkey: long, c_name: string ... 6 more fields]
Table
c_custkey
c_name
c_address
c_nationkey
c_phone
c_acctbal
c_mktsegment
1 412449 Customer#0004124... zAt1nZNG01gOhlqgyDtDa S,Y0VSofZJs1... 14 24-710-983-5536 4973.84 HOUSEHOLD
2 412446 Customer#0004124... 5u8MSbyiC7J,7PuY4Ivaq1JRbTCMKeNVqg 20 30-487-949-7942 9441.59 MACHINERY
3 412447 Customer#0004124... HC4ZT62gKPgrjr ceoaZgFOunlUogr7GO 7 17-797-466-6308 7868.75 AUTOMOBILE
3 rows | 1.00s runtime
Refreshed 34 minutes ago

Sort rows

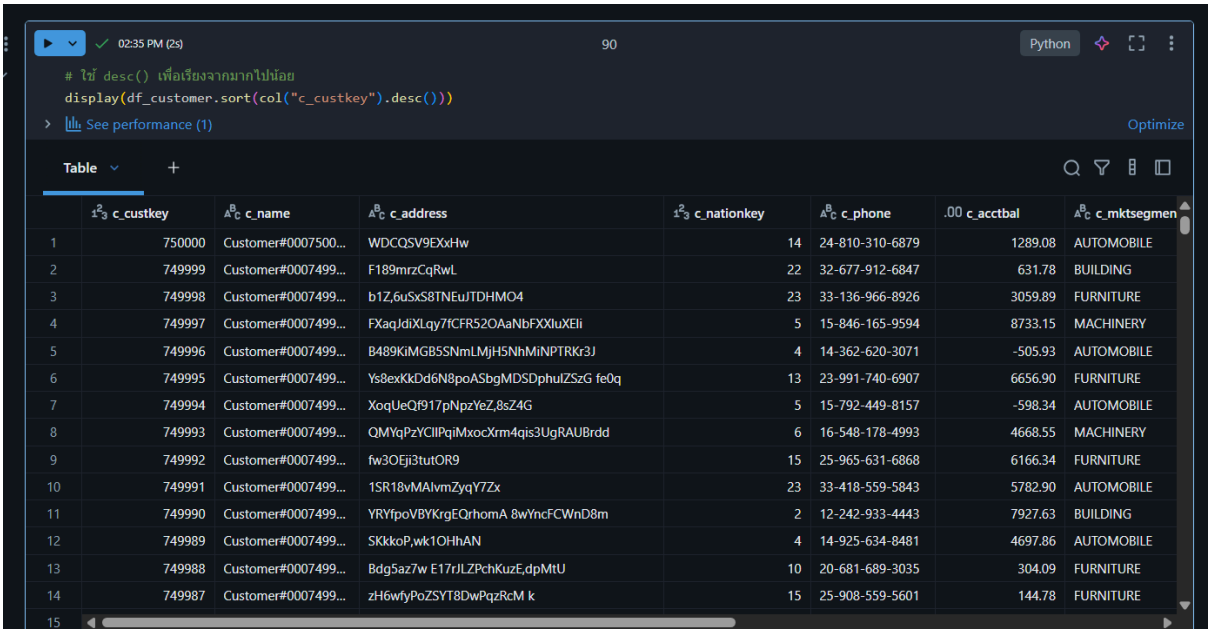
02:35 PM (1s) 89

```
display(df_customer.orderBy(col("c_acctbal")))
```

See performance (1) Optimize

Table +

	c_name	c_address	c_nationkey	c_phone	c_acctbal	c_mktsegment	c_commen
1	Customer#0001488...	oJKqRZcWFE,,9x7e2Z8kgdQq,h	6	16-860-910-6299	-999.99	FURNITURE	instructions caj
2	Customer#0000540...	y6K6q,XqWugY1z6AWSmpiy	21	31-173-610-7413	-999.98	AUTOMOBILE	ckages. special
3	Customer#0000070...	56UWRtTFeF1revNB4m4BFud0,gyGjgVQIdw9hB	4	14-356-473-2563	-999.95	MACHINERY	carefully unusu
4	Customer#0002638...	7kBBlykFnOxf	6	16-609-430-5195	-999.95	FURNITURE	excuses wake i
5	Customer#0001688...	agf1v8GocZbZ zBx62292gUQPlBwdQGZ	1	11-851-335-7609	-999.95	BUILDING	fluffily special
6	Customer#0003232...	WWKNYsZwaq9qEp,YHd9DfmnlbS	13	23-152-829-4985	-999.94	BUILDING	ts. even, pendi
7	Customer#0001235...	mVNNWNuSnobb	21	31-908-400-6759	-999.93	MACHINERY	nt deposits. re
8	Customer#0006222...	agZp7,Y2GQdmzoWtBrFH0yeRVsz	23	33-545-236-9930	-999.92	MACHINERY	. blithely final
9	Customer#0005701...	CKyqLw72qagOWxVfwdvAt99jCIDe	7	17-951-808-5613	-999.90	HOUSEHOLD	requests wake
10	Customer#0007248...	MQ,RKLQ,RjIQVRfnmElvlGGtlqg	13	23-455-962-4517	-999.90	FURNITURE	the furiously e
11	Customer#0006128...	wO8pWLban60PhOG 2JaC09y0LUVB5s45NK4Tzd	14	24-452-144-3866	-999.89	MACHINERY	eodolites eat f
12	Customer#0003875...	,N,1rzN oEXmIAPRbTbTAZGfSihXATNZtROgw	20	30-523-653-9696	-999.89	FURNITURE	ways even requ
13	Customer#0004811...	VbS8Lw8lkCToFU	11	21-859-110-1522	-999.88	MACHINERY	slow theodolit



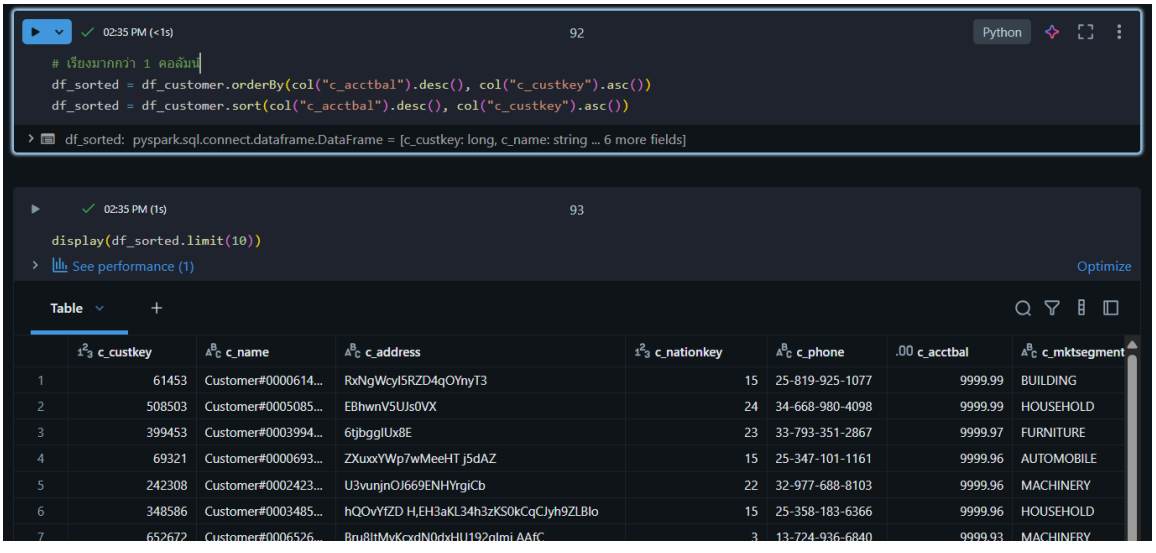
02:35 PM (2s) 90 Python

```
# ใช้ desc() เพื่อเรียงจากมากไปน้อย
display(df_customer.sort(col("c_custkey").desc()))
```

See performance (1) Optimize

Table +

	c_custkey	c_name	c_address	c_nationkey	c_phone	c_acctbal	c_mktsegmen
1	750000	Customer#0007500...	WDCQSV9EXxHw	14	24-810-310-6879	1289.08	AUTOMOBILE
2	749999	Customer#0007499...	F189mrzCqRwL	22	32-677-912-6847	631.78	BUILDING
3	749998	Customer#0007499...	b1Z,6uSxS8TNEuJTDHMO4	23	33-136-966-8926	3059.89	FURNITURE
4	749997	Customer#0007499...	FXaqJdiXLqy7fCFR52OAaNbFXXluXEli	5	15-846-165-9594	8733.15	MACHINERY
5	749996	Customer#0007499...	B489KiMGB5SNmLMjH5NhMiNPTRKr3J	4	14-362-620-3071	-505.93	AUTOMOBILE
6	749995	Customer#0007499...	Ys8exKkDd6N8poASbgMDSDphuIZSzG fe0q	13	23-991-740-6907	6656.90	FURNITURE
7	749994	Customer#0007499...	XoqUeQf917pNpzYeZ,8sZ4G	5	15-792-449-8157	-598.34	AUTOMOBILE
8	749993	Customer#0007499...	QMYqPzYClIPqiMxocXrm4qis3UgRAUBrdd	6	16-548-178-4993	4668.55	MACHINERY
9	749992	Customer#0007499...	fw3OEji3tutOR9	15	25-965-631-6868	6166.34	FURNITURE
10	749991	Customer#0007499...	1SR18vMAlvmZyqY7Zx	23	33-418-559-5843	5782.90	AUTOMOBILE
11	749990	Customer#0007499...	YRYfpoVBYKrgEQrhomA 8wYncFCWnD8m	2	12-242-933-4443	7927.63	BUILDING
12	749989	Customer#0007499...	SKkkoP,wk1OHhAN	4	14-925-634-8481	4697.86	AUTOMOBILE
13	749988	Customer#0007499...	Bdg5az7w E17rJLZPchKuzE,dpMtU	10	20-681-689-3035	304.09	FURNITURE
14	749987	Customer#0007499...	zH6wfyPoZSYT8DwPqzRcM k	15	25-908-559-5601	144.78	FURNITURE
15							



02:35 PM (<1s) 92 Python

```
# เรียงมากกว่า 1 คอลัมน์
df_sorted = df_customer.orderBy(col("c_acctbal").desc(), col("c_custkey").asc())
df_sorted = df_customer.sort(col("c_acctbal").desc(), col("c_custkey").asc())
```

df_sorted: pyspark.sql.connect.dataframe.DataFrame = [c_custkey: long, c_name: string ... 6 more fields]

02:35 PM (1s) 93

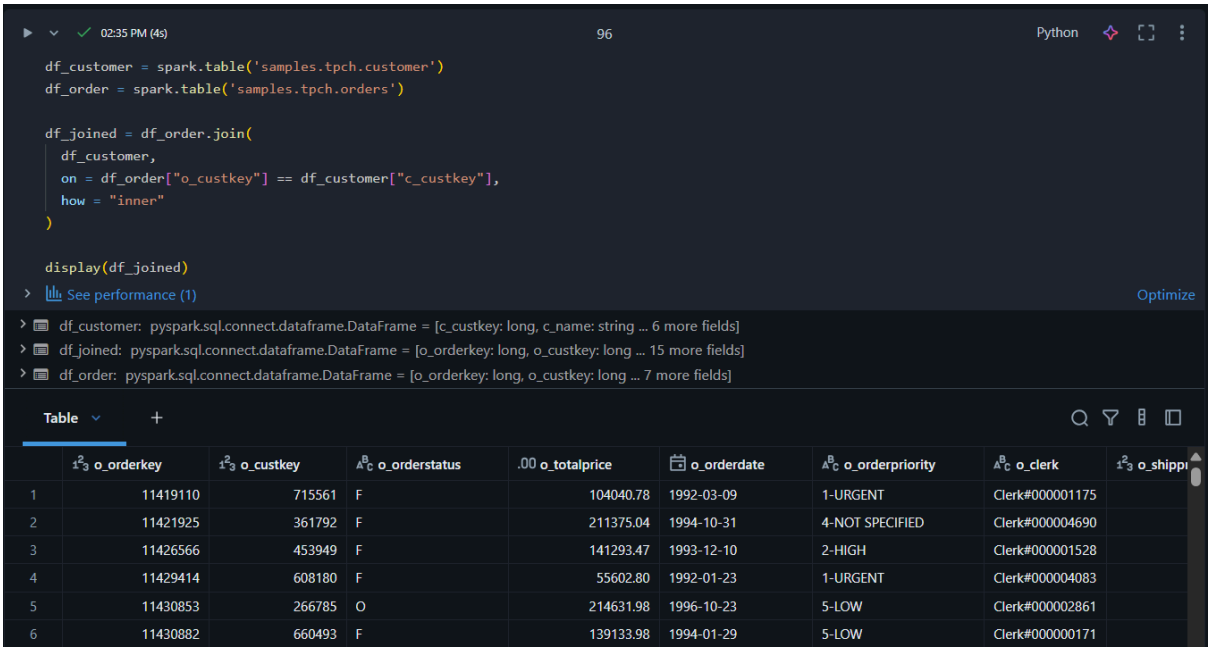
```
display(df_sorted.limit(10))
```

See performance (1) Optimize

Table +

	c_custkey	c_name	c_address	c_nationkey	c_phone	c_acctbal	c_mktsegment
1	61453	Customer#0000614...	RxNgWcyl5RZD4qOYnyT3	15	25-819-925-1077	9999.99	BUILDING
2	508503	Customer#0005085...	EBhwnV5UJs0VX	24	34-668-980-4098	9999.99	HOUSEHOLD
3	399453	Customer#0003994...	6tjbgglUx8E	23	33-793-351-2867	9999.97	FURNITURE
4	69321	Customer#0000693...	ZXuxxYWp7wMeeHT j5dAZ	15	25-347-101-1161	9999.96	AUTOMOBILE
5	242308	Customer#0002423...	U3vunjnOJ669ENHYrgiCb	22	32-977-688-8103	9999.96	MACHINERY
6	348586	Customer#0003485...	hQOvYfZD H,EH3aKL34h3zKS0kCqCJyh9ZLBlo	15	25-358-183-6366	9999.96	HOUSEHOLD
7	652672	Customer#0006526...	Bru8ltMvKcxdN0dxHU192qlmi AAfC	3	13-724-936-6840	9999.93	MACHINERY

Join DataFrames



```
df_customer = spark.table('samples.tpch.customer')
df_order = spark.table('samples.tpch.orders')

df_joined = df_order.join(
  df_customer,
  on = df_order["o_custkey"] == df_customer["c_custkey"],
  how = "inner"
)

display(df_joined)
```

02:35 PM (4s) 96 Python

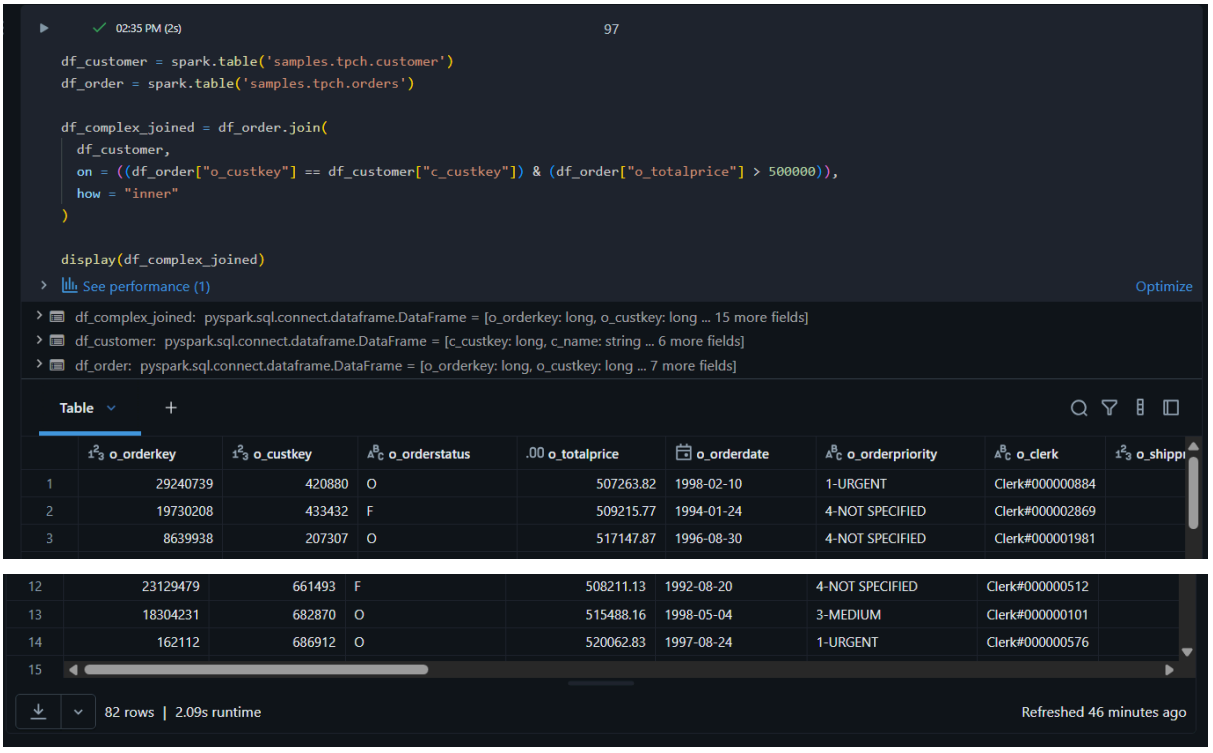
See performance (1) Optimize

df_customer: pyspark.sql.connect.dataframe.DataFrame = [c_custkey: long, c_name: string ... 6 more fields]
df_joined: pyspark.sql.connect.dataframe.DataFrame = [o_orderkey: long, o_custkey: long ... 15 more fields]
df_order: pyspark.sql.connect.dataframe.DataFrame = [o_orderkey: long, o_custkey: long ... 7 more fields]

Table

	o_orderkey	o_custkey	o_orderstatus	o_totalprice	o_orderdate	o_orderpriority	o_clerk	o_shippi
1	11419110	715561	F	104040.78	1992-03-09	1-URGENT	Clerk#000001175	
2	11421925	361792	F	211375.04	1994-10-31	4-NOT SPECIFIED	Clerk#000004690	
3	11426566	453949	F	141293.47	1993-12-10	2-HIGH	Clerk#000001528	
4	11429414	608180	F	55602.80	1992-01-23	1-URGENT	Clerk#000004083	
5	11430853	266785	O	214631.98	1996-10-23	5-LOW	Clerk#000002861	
6	11430882	660493	F	139133.98	1994-01-29	5-LOW	Clerk#000000171	

6555+ rows



```
df_customer = spark.table('samples.tpch.customer')
df_order = spark.table('samples.tpch.orders')

df_complex_joined = df_order.join(
  df_customer,
  on = ((df_order["o_custkey"] == df_customer["c_custkey"]) & (df_order["o_totalprice"] > 500000)),
  how = "inner"
)

display(df_complex_joined)
```

02:35 PM (2s) 97

See performance (1) Optimize

df_complex_joined: pyspark.sql.connect.dataframe.DataFrame = [o_orderkey: long, o_custkey: long ... 15 more fields]
df_customer: pyspark.sql.connect.dataframe.DataFrame = [c_custkey: long, c_name: string ... 6 more fields]
df_order: pyspark.sql.connect.dataframe.DataFrame = [o_orderkey: long, o_custkey: long ... 7 more fields]

Table

	o_orderkey	o_custkey	o_orderstatus	o_totalprice	o_orderdate	o_orderpriority	o_clerk	o_shippi
1	29240739	420880	O	507263.82	1998-02-10	1-URGENT	Clerk#000000884	
2	19730208	433432	F	509215.77	1994-01-24	4-NOT SPECIFIED	Clerk#000002869	
3	8639938	207307	O	517147.87	1996-08-30	4-NOT SPECIFIED	Clerk#000001981	

12	23129479	661493	F	508211.13	1992-08-20	4-NOT SPECIFIED	Clerk#000000512
13	18304231	682870	O	515488.16	1998-05-04	3-MEDIUM	Clerk#000000101
14	162112	686912	O	520062.83	1997-08-24	1-URGENT	Clerk#000000576
15							

82 rows | 2.09s runtime Refreshed 46 minutes ago

Aggregate data

02:35 PM (1s) 101

```
from pyspark.sql.functions import avg

# group by one column
df_segment_balance = df_customer.groupBy("c_mktsegment").agg(
    avg(df_customer["c_acctbal"])
)

display(df_segment_balance)
```

See performance (1)

df_segment_balance: pyspark.sql.connect.dataframe.DataFrame = [c_mktsegment: string, avg(c_acctbal): decimal(22,6)]

Table +

	c_mktsegment	avg(c_acctbal)
1	BUILDING	4509.073485
2	MACHINERY	4494.998388
3	AUTOMOBILE	4495.681835
4	HOUSEHOLD	4508.414341
5	FURNITURE	4496.971036

5 rows | 0.99s runtime

02:35 PM (1s) 102

```
# แยกตาม nation ด้วย
from pyspark.sql.functions import avg

# group by two columns
df_segment_nation_balance = df_customer.groupBy("c_mktsegment", "c_nationkey").agg(
    avg(df_customer["c_acctbal"])
)

display(df_segment_nation_balance)
```

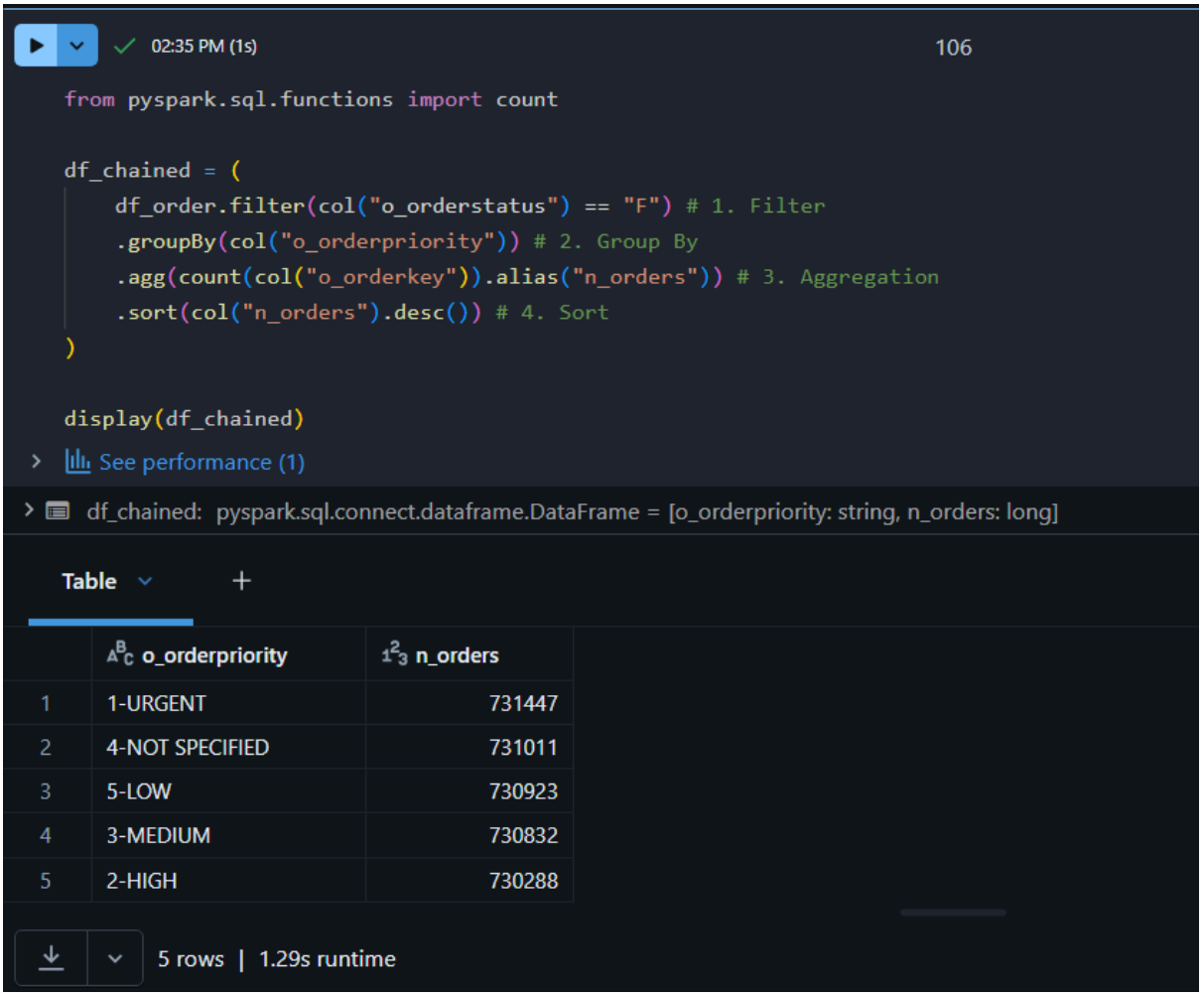
See performance (1)

df_segment_nation_balance: pyspark.sql.connect.dataframe.DataFrame = [c_mktsegment: string, c_nationkey: long ... 1 more field]

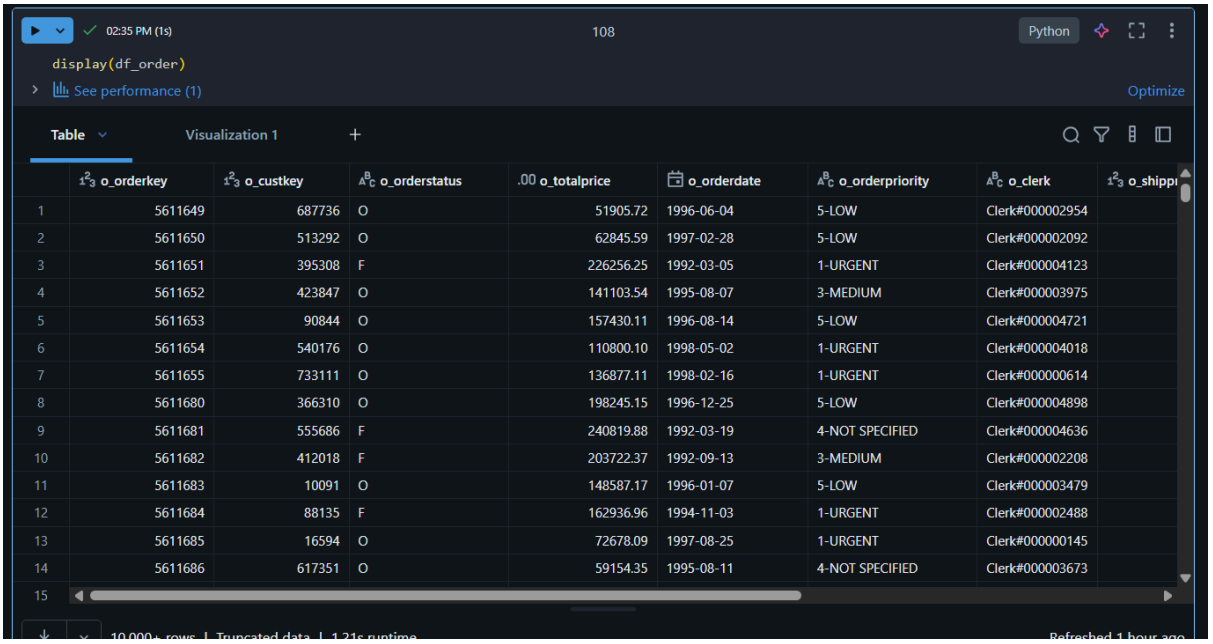
Table +

	c_mktsegment	c_nationkey	avg(c_acctbal)
1	BUILDING	21	4537.355840
2	MACHINERY	20	4506.505043
3	AUTOMOBILE	7	4457.661147
4	MACHINERY	6	4413.460338
5	HOUSEHOLD	14	4515.775535
6	BUILDING	20	4537.627599
7	AUTOMOBILE	10	4494.695059
8	MACHINERY	21	4500.694374

Chaining calls

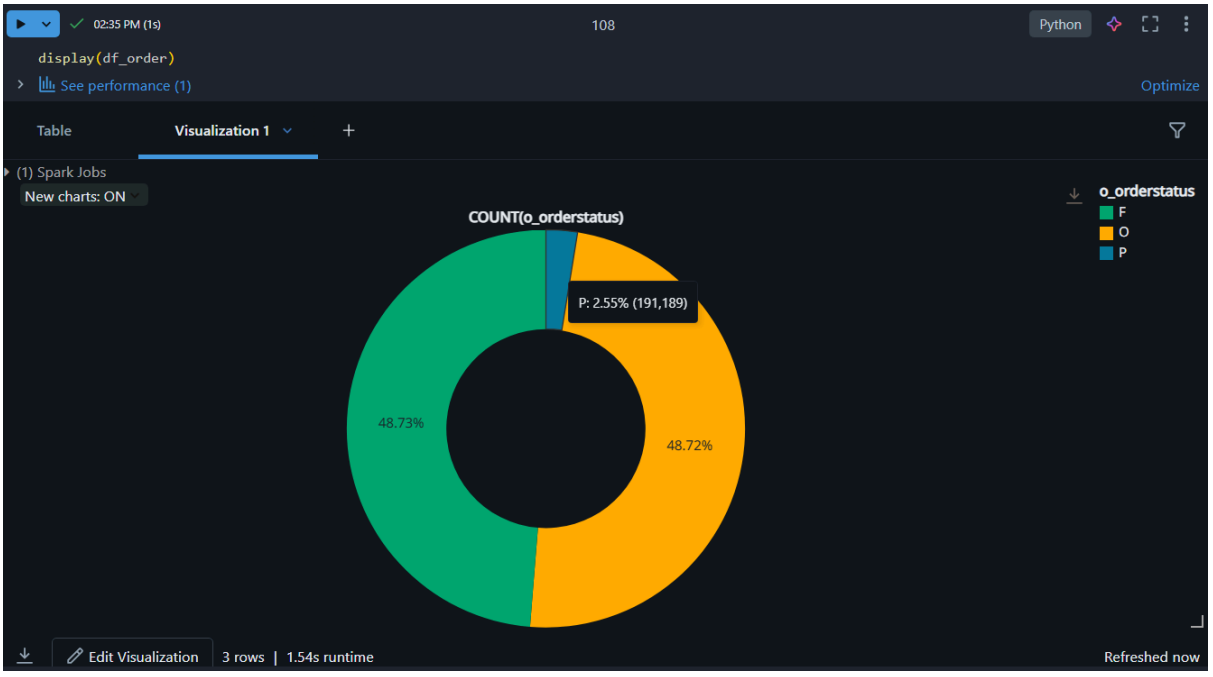


Visualize your DataFrame



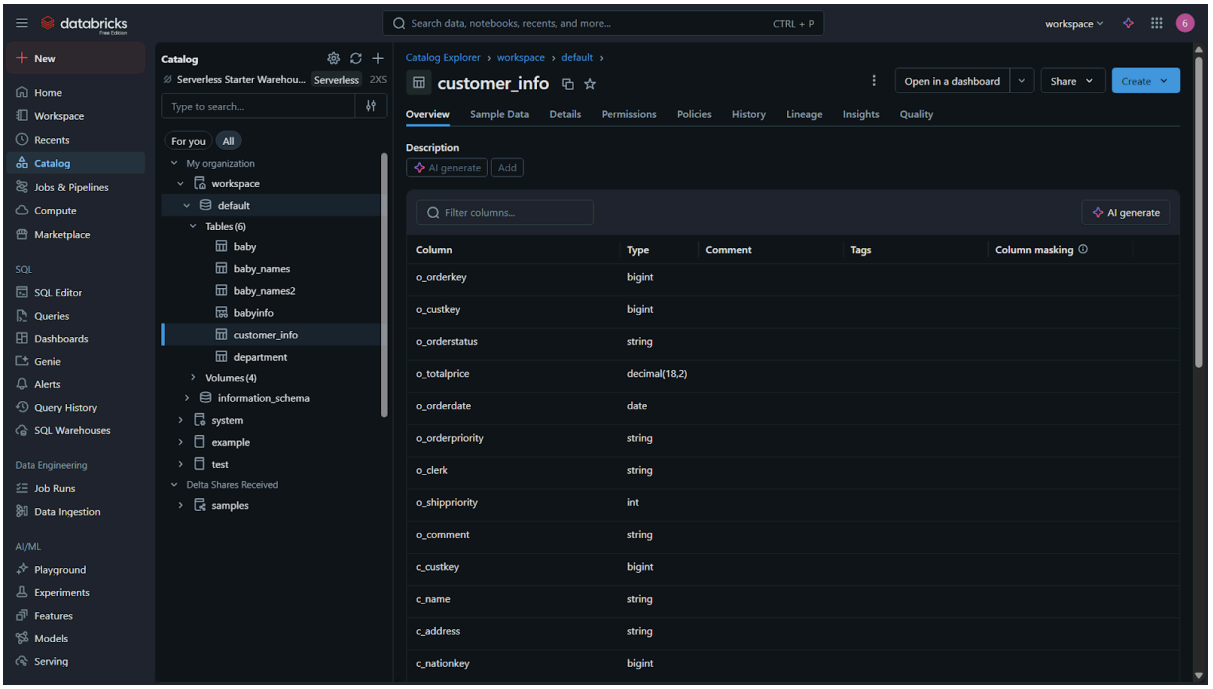
	o_orderkey	o_custkey	o_orderstatus	o_totalprice	o_orderdate	o_orderpriority	o_clerk	o_shippr
1	5611649	687736	O	51905.72	1996-06-04	5-LOW	Clerk#000002954	
2	5611650	513292	O	62845.59	1997-02-28	5-LOW	Clerk#000002092	
3	5611651	395308	F	226256.25	1992-03-05	1-URGENT	Clerk#000004123	
4	5611652	423847	O	141103.54	1995-08-07	3-MEDIUM	Clerk#000003975	
5	5611653	90844	O	157430.11	1996-08-14	5-LOW	Clerk#000004721	
6	5611654	540176	O	110800.10	1998-05-02	1-URGENT	Clerk#000004018	
7	5611655	733111	O	136877.11	1998-02-16	1-URGENT	Clerk#000000614	
8	5611680	366310	O	198245.15	1996-12-25	5-LOW	Clerk#000004898	
9	5611681	555686	F	240819.88	1992-03-19	4-NOT SPECIFIED	Clerk#000004636	
10	5611682	412018	F	203722.37	1992-09-13	3-MEDIUM	Clerk#000002208	
11	5611683	10091	O	148587.17	1996-01-07	5-LOW	Clerk#000003479	
12	5611684	88135	F	162936.96	1994-11-03	1-URGENT	Clerk#000002488	
13	5611685	16594	O	72678.09	1997-08-25	1-URGENT	Clerk#000000145	
14	5611686	617351	O	59154.35	1995-08-11	4-NOT SPECIFIED	Clerk#000003673	
15								

ตัวอย่าง Viz



Save your data

Save your DataFrame as a table



Write your DataFrame as CSV