INDIAN DATA CLUB

CODE BASICS

databricks

14 DAYS

AI CHALLENGE

DAY 06

Topic:

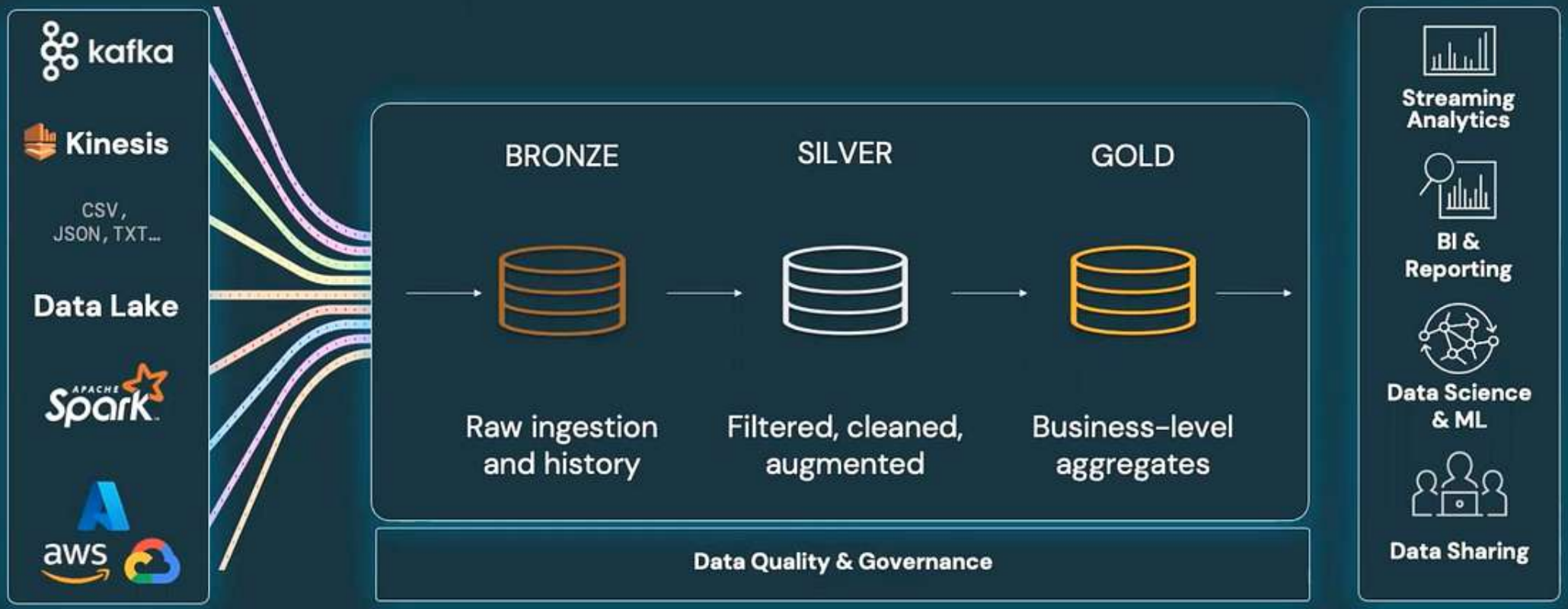
Medallion Architecture

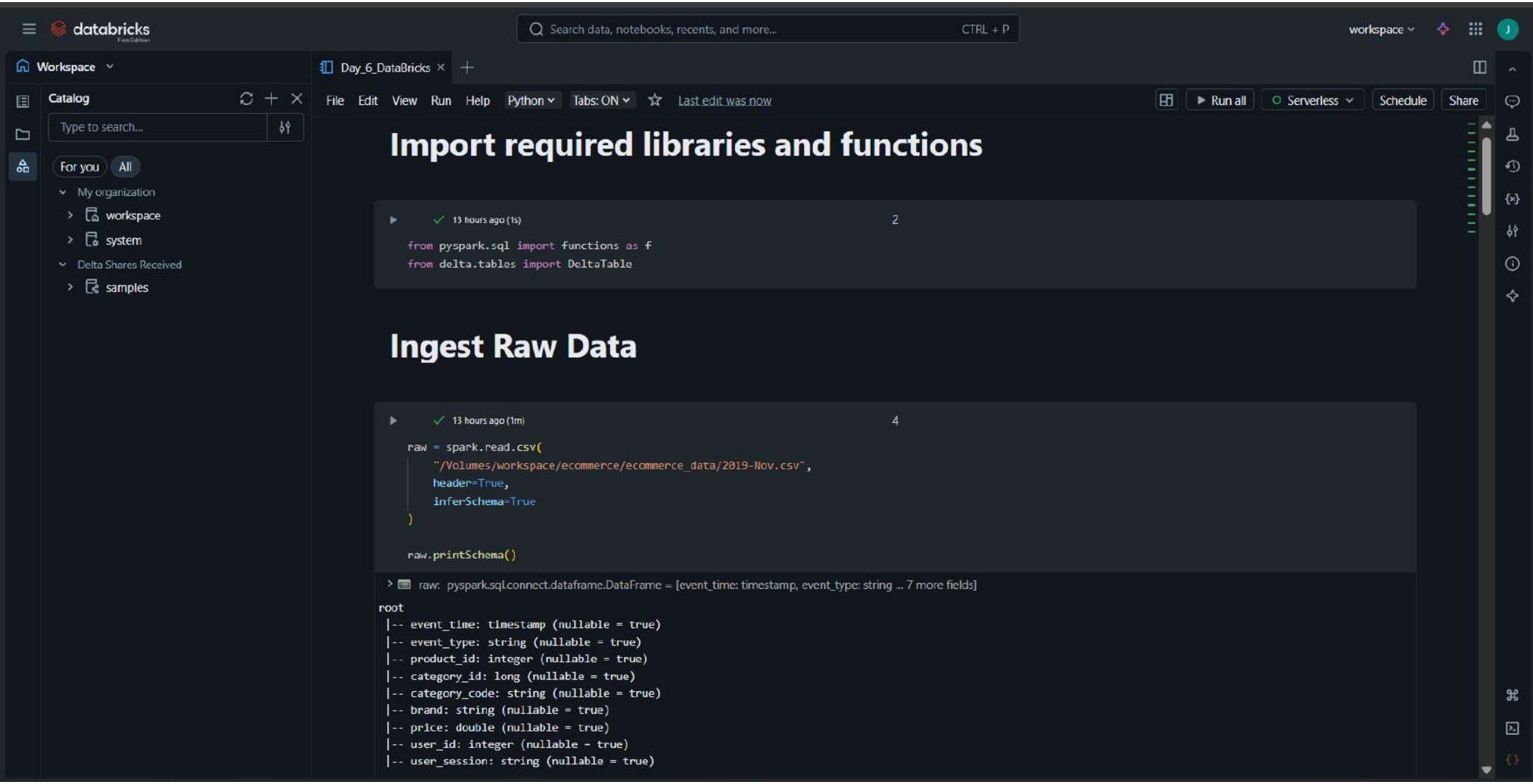
Challenge:

1. Design 3-layer architecture
2. Build Bronze: raw ingestion
3. Build Silver: cleaning & validation
4. Build Gold: business aggregates

#DatabricksWithIDC

Medallion Architecture in the Lakehouse

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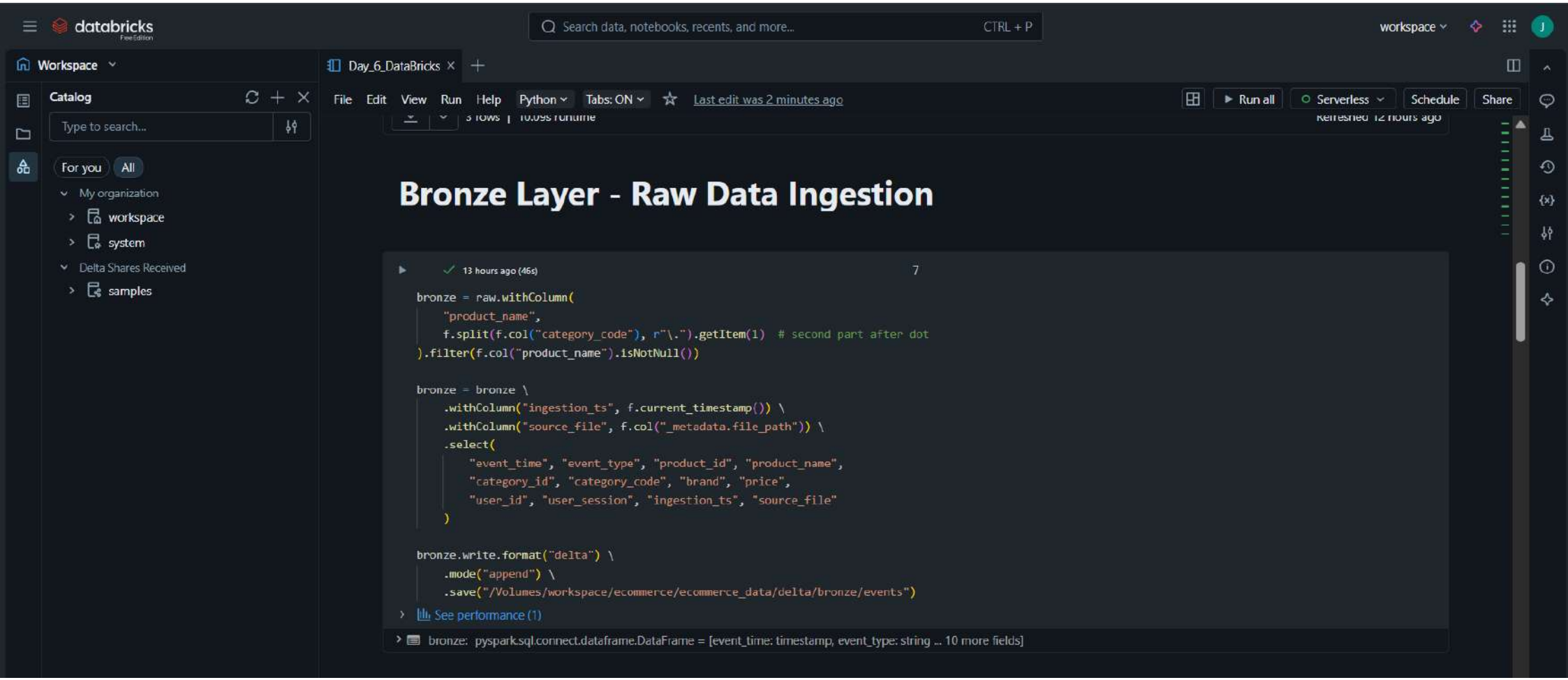
Delta Shares Received
samples
Import required libraries and functions
13 hours ago (1s) 2
from pyspark.sql import functions as f
from delta.tables import DeltaTable
Ingest Raw Data
13 hours ago (1m) 4
raw = spark.read.csv(
"/Volumes/workspace/ecommerce/ecommerce_data/2019-Nov.csv",
header=True,
inferSchema=True
)
raw.printSchema()
raw: pyspark.sql.connect.dataframe.DataFrame = [event_time: timestamp, event_type: string ... 7 more fields]
root
|-- event_time: timestamp (nullable = true)
|-- event_type: string (nullable = true)
|-- product_id: integer (nullable = true)
|-- category_id: long (nullable = true)
|-- category_code: string (nullable = true)
|-- brand: string (nullable = true)
|-- price: double (nullable = true)
|-- user_id: integer (nullable = true)
|-- user_session: string (nullable = true)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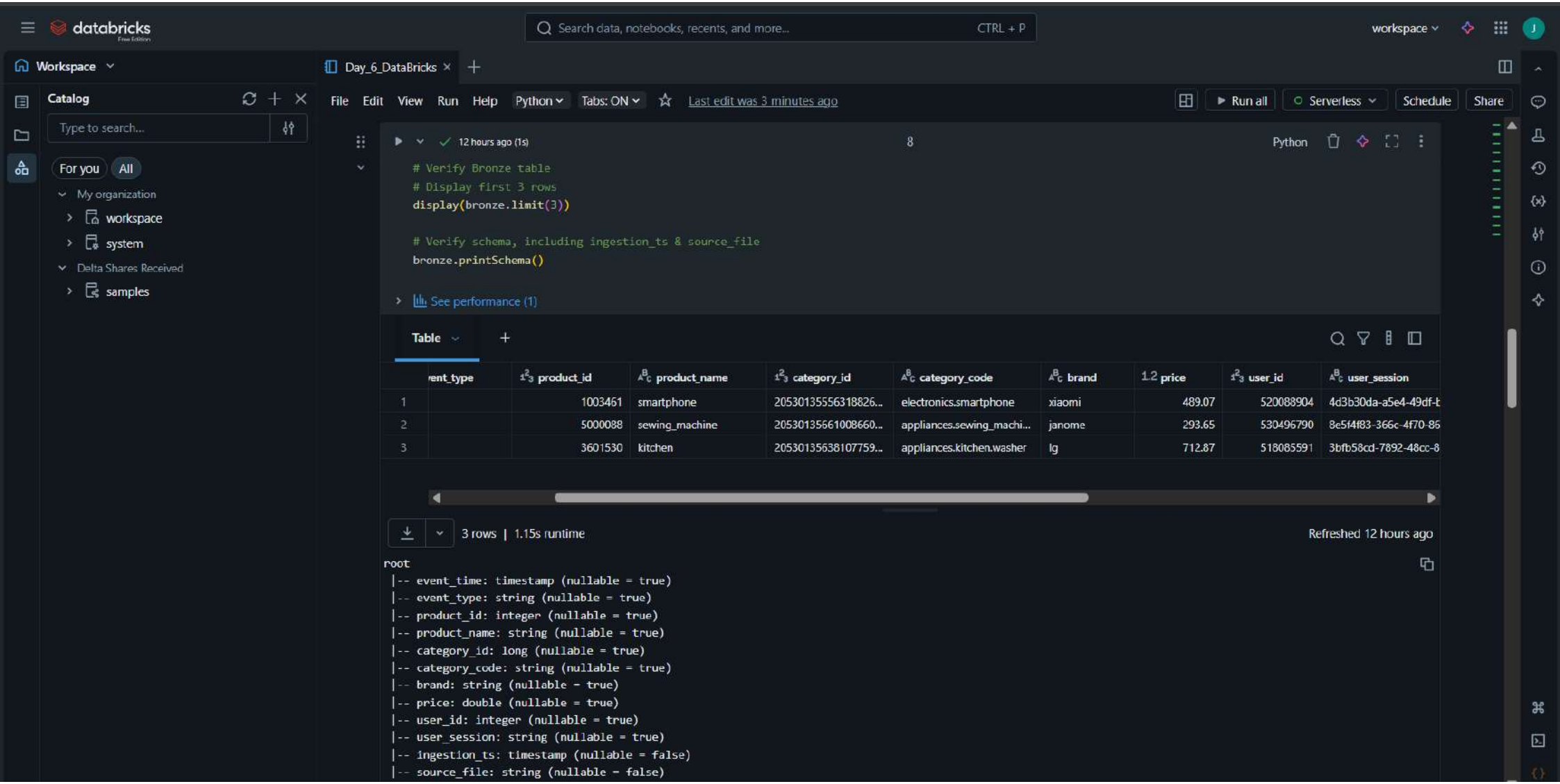
Bronze Layer - Raw Data Ingestion
13 hours ago (46s)
bronze = raw.withColumn(
"product_name",
f.split(f.col("category_code"), r"\.").getItem(1) # second part after dot
).filter(f.col("product_name").isNotNull())
bronze = bronze \
.withColumn("ingestion_ts", f.current_timestamp()) \
.withColumn("source_file", f.col("_metadata.file_path")) \
.select(
"event_time", "event_type", "product_id", "product_name",
"category_id", "category_code", "brand", "price",
"user_id", "user_session", "ingestion_ts", "source_file"
)
bronze.write.format("delta") \
.mode("append") \
.save("/Volumes/workspace/ecommerce/ecommerce_data/delta/bronze/events")
See performance (1)
bronze: pyspark.sql.connect.dataframe.DataFrame = [event_time: timestamp, event_type: string ... 10 more fields]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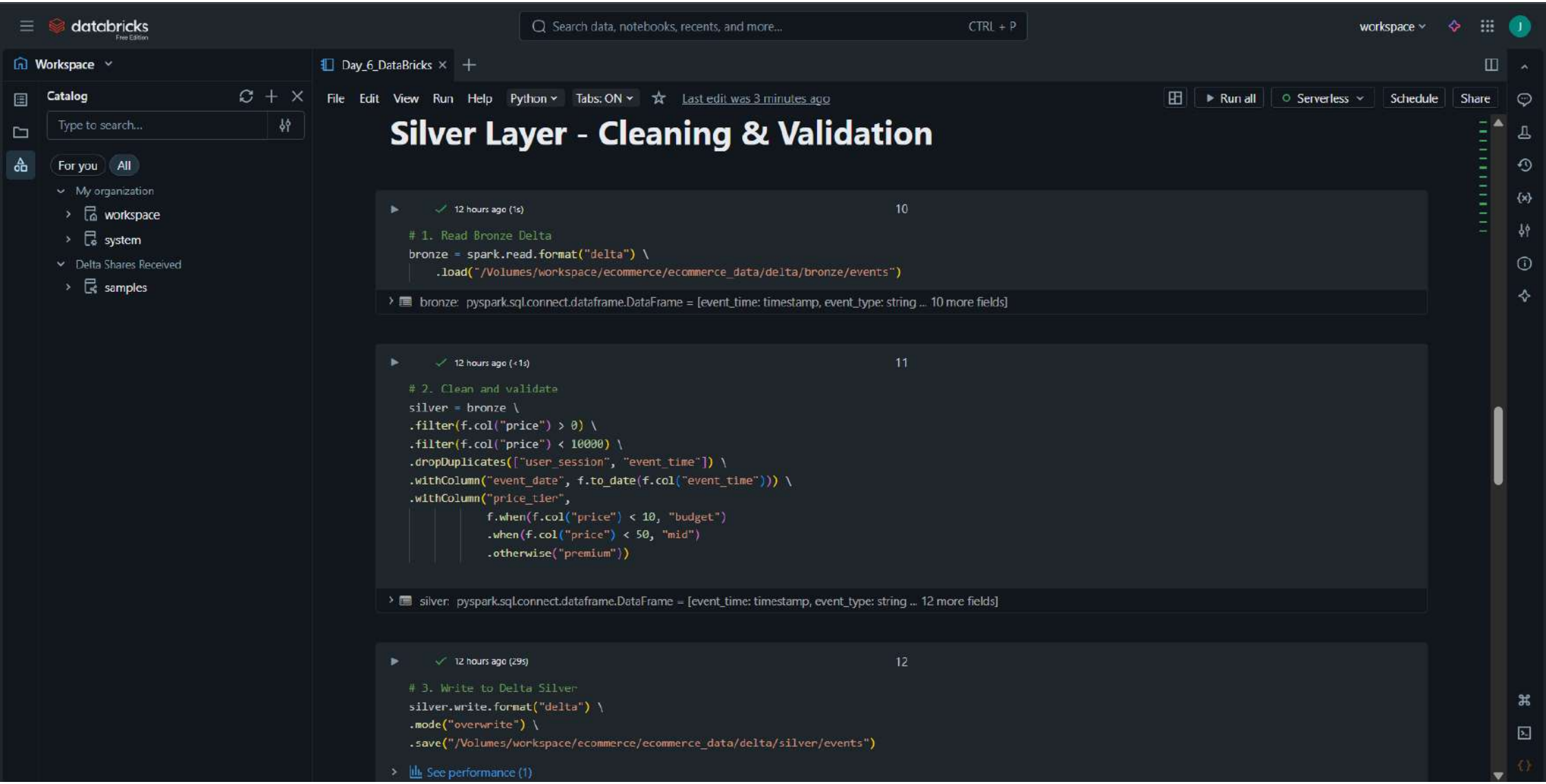
Share
12 hours ago (1s)
8
Python
# Verify Bronze table
# Display first 3 rows
display(bronze.limit(3))
# Verify schema, including ingestion_ts & source_file
bronze.printSchema()
See performance (1)
Table
ent_type
product_id
product_name
category_id
category_code
brand
price
user_id
user_session
1 1003461 smartphone 20530135556318826... electronics.smartphone xiaomi 489.07 520088904 4d3b30da-a5e4-49df-b
2 5000088 sewing_machine 20530135661008660... appliances.sewing_machi... janome 293.65 530496790 8e5f4f83-366c-4f70-86
3 3601530 kitchen 20530135638107759... appliances.kitchen.washer lg 712.87 518085591 3bfb58cd-7892-48cc-8
3 rows | 1.15s runtime
Refreshed 12 hours ago
root
|-- event_time: timestamp (nullable = true)
|-- event_type: string (nullable = true)
|-- product_id: integer (nullable = true)
|-- product_name: string (nullable = true)
|-- category_id: long (nullable = true)
|-- category_code: string (nullable = true)
|-- brand: string (nullable = true)
|-- price: double (nullable = true)
|-- user_id: integer (nullable = true)
|-- user_session: string (nullable = true)
|-- ingestion_ts: timestamp (nullable = false)
|-- source_file: string (nullable = false)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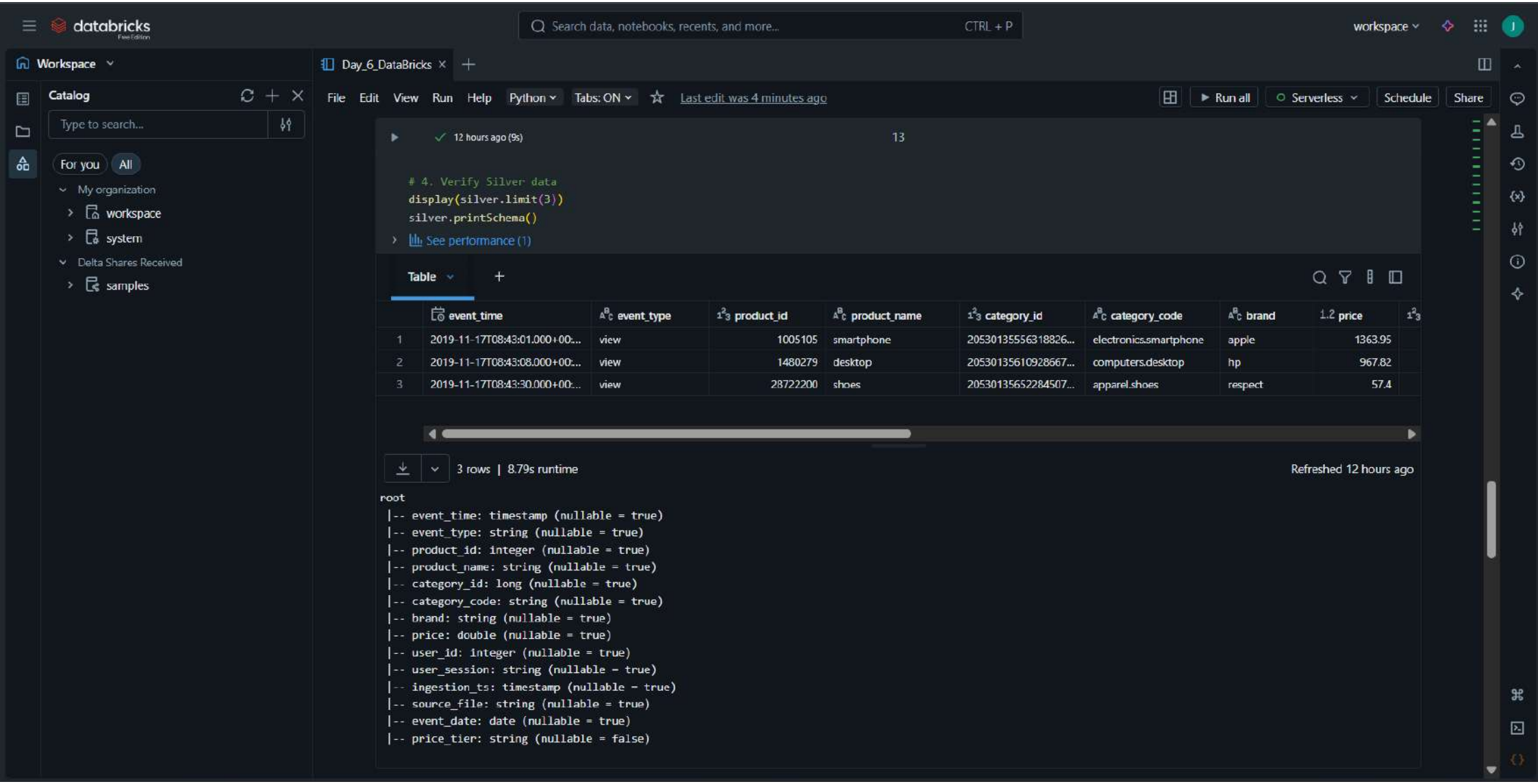
Silver Layer - Cleaning & Validation
12 hours ago (1s)
10
# 1. Read Bronze Delta
bronze = spark.read.format("delta") \
.load("/Volumes/workspace/ecommerce/ecommerce_data/delta/bronze/events")
bronze: pyspark.sql.connect.dataframe.DataFrame = [event_time: timestamp, event_type: string ... 10 more fields]
12 hours ago (<1s)
11
# 2. Clean and validate
silver = bronze \
.filter(f.col("price") > 0) \
.filter(f.col("price") < 10000) \
.dropDuplicates(["user_session", "event_time"]) \
.withColumn("event_date", f.to_date(f.col("event_time"))) \
.withColumn("price_tier",
f.when(f.col("price") < 10, "budget")
.when(f.col("price") < 50, "mid")
.otherwise("premium"))
silver: pyspark.sql.connect.dataframe.DataFrame = [event_time: timestamp, event_type: string ... 12 more fields]
12 hours ago (29s)
12
3. Write to Delta Silver
silver.write.format("delta") \
.mode("overwrite") \
.save("/Volumes/workspace/ecommerce/ecommerce_data/delta/silver/events")
See performance (1)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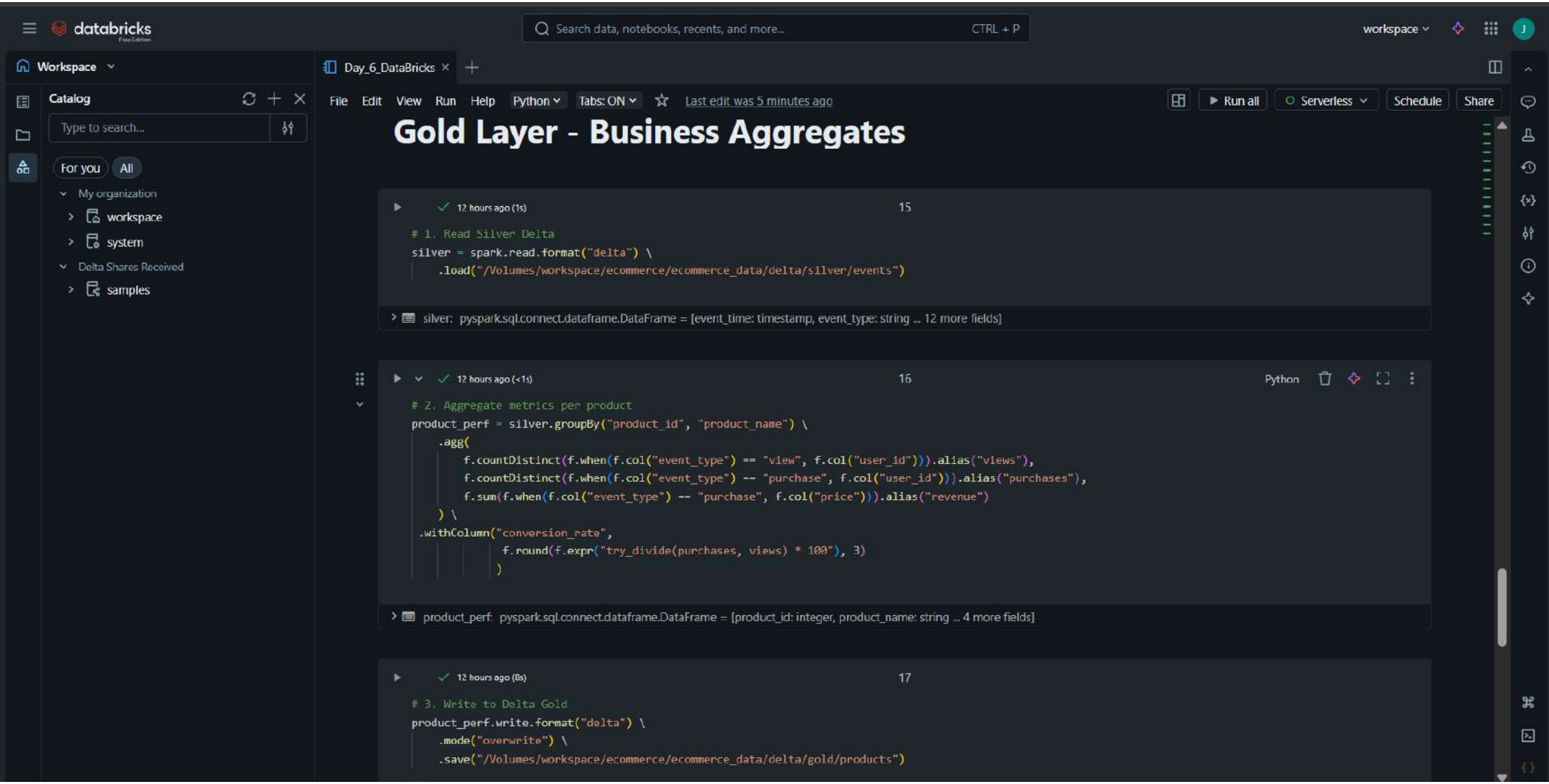
Last edit was 4 minutes ago
Run all
Serverless
Schedule
Share
12 hours ago (9s)
13
# 4. Verify Silver data
display(silver.limit(3))
silver.printSchema()
See performance (1)
Table
event_time
event_type
product_id
product_name
category_id
category_code
brand
price
1 2019-11-17T08:43:01.000+00:... view 1005105 smartphone 20530135556318826... electronics.smartphone apple 1363.95
2 2019-11-17T08:43:08.000+00:... view 1480279 desktop 2053013561092866 7... computers.desktop hp 967.82
3 2019-11-17T08:43:30.000+00:... view 28722200 shoes 20530135652284507... apparel.shoes respect 57.4
3 rows | 8.79s runtime
Refreshed 12 hours ago
root
|-- event_time: timestamp (nullable = true)
|-- event_type: string (nullable = true)
|-- product_id: integer (nullable = true)
|-- product_name: string (nullable = true)
|-- category_id: long (nullable = true)
|-- category_code: string (nullable = true)
|-- brand: string (nullable = true)
|-- price: double (nullable = true)
|-- user_id: integer (nullable = true)
|-- user_session: string (nullable = true)
|-- ingestion_ts: timestamp (nullable = true)
|-- source_file: string (nullable = true)
|-- event_date: date (nullable = true)
|-- price_tier: string (nullable = false)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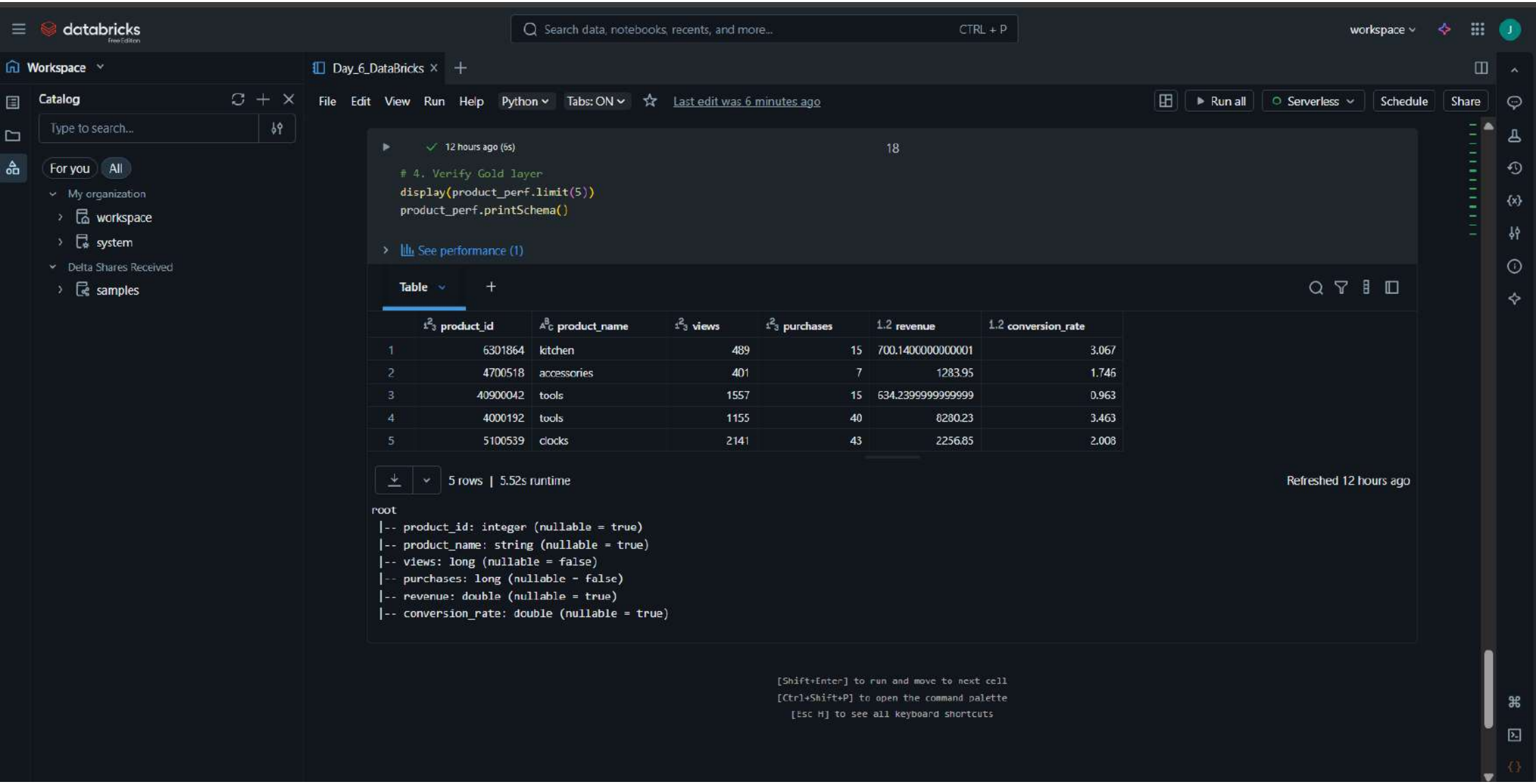
Run all
Serverless
Schedule
Share
Gold Layer - Business Aggregates
12 hours ago (1s)
15
# 1. Read Silver Delta
silver = spark.read.format("delta") \
.load("/Volumes/workspace/ecommerce/ecommerce_data/delta/silver/events")
silver: pyspark.sql.connect.dataframe.DataFrame = [event_time: timestamp, event_type: string ... 12 more fields]
12 hours ago (<1s)
16
Python
# 2. Aggregate metrics per product
product_perf = silver.groupBy("product_id", "product_name") \
.agg(
f.countDistinct(f.when(f.col("event_type") == "view", f.col("user_id"))).alias("views"),
f.countDistinct(f.when(f.col("event_type") == "purchase", f.col("user_id"))).alias("purchases"),
f.sum(f.when(f.col("event_type") == "purchase", f.col("price"))).alias("revenue")
) \
.withColumn("conversion_rate",
f.round(f.expr("try_divide(purchases, views) * 100"), 3)
)
product_perf: pyspark.sql.connect.dataframe.DataFrame = [product_id: integer, product_name: string ... 4 more fields]
12 hours ago (0s)
17
3. Write to Delta Gold
product_perf.write.format("delta") \
.mode("overwrite") \
.save("/Volumes/workspace/ecommerce/ecommerce_data/delta/gold/products")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12 hours ago (6s)
18
# 4. Verify Gold layer
display(product_perf.limit(5))
product_perf.printSchema()
See performance (1)
Table
product_id
product_name
views
purchases
revenue
conversion_rate
1 6301864 kitchen 489 15 700.1400000000001 3.067
2 4700518 accessories 401 7 1283.95 1.746
3 40900042 tools 1557 15 634.2399999999999 0.963
4 4000192 tools 1155 40 8280.23 3.463
5 5100539 clocks 2141 43 2256.85 2.008
5 rows | 5.52s runtime
Refreshed 12 hours ago
root
|-- product_id: integer (nullable = true)
|-- product_name: string (nullable = true)
|-- views: long (nullable = false)
|-- purchases: long (nullable = false)
|-- revenue: double (nullable = true)
|-- conversion_rate: double (nullable = true)
[Shift+Enter] to run and move to next cell
[Ctrl+Shift+P] to open the command palette
[Esc H] to see all keyboard shortcuts