

Electronics sales

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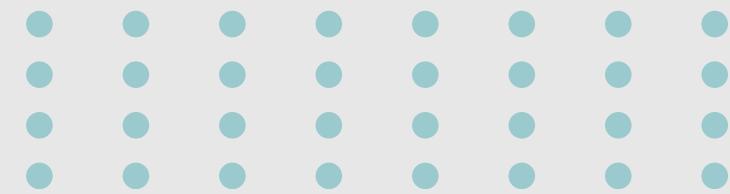


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DATA CLEANING

During this phase, I examined the `sales.csv` and `reviews.txt` files to identify any issues requiring cleanup. I then applied Python scripts to address and resolve the detected problems based on the observed needs.





DATA CLEANING

Sales.csv:

The following issues were identified in this file:

1. Presence of empty rows.
 2. Duplicated rows.
 3. The "Order Date" column includes both date and time.

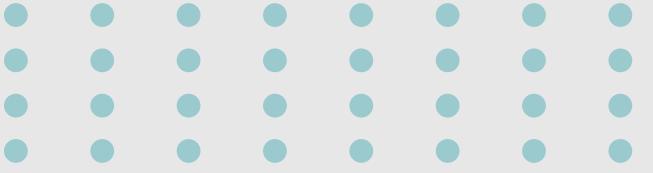


DATA CLEANING

Sales.csv python cleaning code:

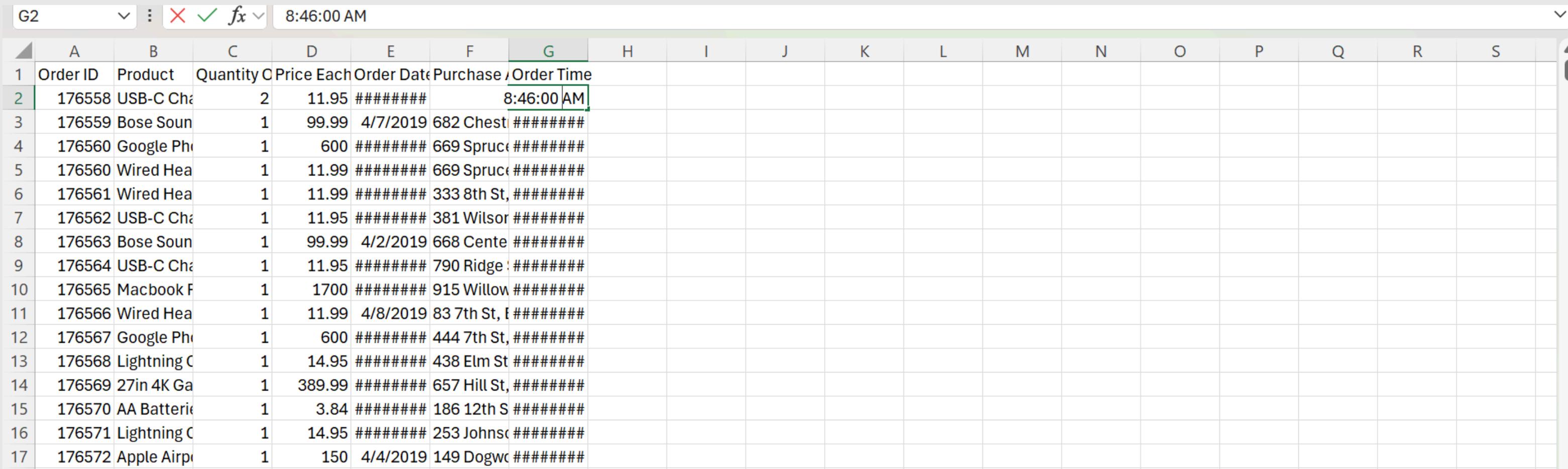
```
C:\> Users > taifa > OneDrive > سطح المكتب > data analysis camp > Final project > Electronics > clean_sales.py ...
1 import pandas as pd
2
3 # Path to the input CSV file
4 input_csv_file = 'Updated_sales.csv'
5
6 # Path to the output CSV file
7 output_csv_file = 'cleaned_sales.csv'
8
9 # Read the CSV file into a DataFrame
10 df = pd.read_csv(input_csv_file)
11
12 # Drop rows where all elements are NaN
13 df_cleaned = df.dropna(how='all')
14
15 # Drop duplicate rows
16 df_cleaned = df_cleaned.drop_duplicates()
17
18 # Attempt to convert 'Order Date' to datetime format, handle errors
19 def parse_date(date_str):
20     try:
21         return pd.to_datetime(date_str, errors='coerce')
22     except Exception as e:
23         print(f"Error parsing date: {e}")
24         return pd.NaT
25
26 df_cleaned['Order Date'] = df_cleaned['Order Date'].apply(parse_date)
27
28 # Drop rows where 'Order Date' could not be parsed
29 df_cleaned = df_cleaned.dropna(subset=['Order Date'])
30
31 # Create 'Order Time' column by extracting time from 'Order Date'
32 df_cleaned['Order Time'] = df_cleaned['Order Date'].dt.strftime('%I:%M:%S %p')
33
34 # Format 'Order Date' column to a specific date format (e.g., 'YYYY-MM-DD')
35 df_cleaned['Order Date'] = df_cleaned['Order Date'].dt.strftime('%Y-%m-%d')
36
37 # Optionally, reset the index after dropping rows
38 df_cleaned.reset_index(drop=True, inplace=True)
39
40 # Save the cleaned DataFrame back to a new CSV file
41 df_cleaned.to_csv(output_csv_file, index=False)
42
43 print(f"Empty rows and duplicates removed. 'Order Date' formatted to 'YYYY-MM-DD' and 'Order Time' extracted. Cleaned file saved to {output_csv_file}")
```





DATA CLEANING

Result after cleaning:



1	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S
2	176558	USB-C Char	2	11.95	#####	8/4/2019	8:46:00 AM												
3	176559	Bose Sound	1	99.99	4/7/2019	682 Chest	#####												
4	176560	Google Pho	1	600	#####	669 Spruce	#####												
5	176560	Wired Head	1	11.99	#####	669 Spruce	#####												
6	176561	Wired Head	1	11.99	#####	333 8th St,	#####												
7	176562	USB-C Char	1	11.95	#####	381 Wilsor	#####												
8	176563	Bose Sound	1	99.99	4/2/2019	668 Cente	#####												
9	176564	USB-C Char	1	11.95	#####	790 Ridge	#####												
10	176565	Macbook Pro	1	1700	#####	915 Willow	#####												
11	176566	Wired Head	1	11.99	4/8/2019	83 7th St,	#####												
12	176567	Google Pho	1	600	#####	444 7th St,	#####												
13	176568	Lightning C	1	14.95	#####	438 Elm St	#####												
14	176569	27in 4K Ga	1	389.99	#####	657 Hill St,	#####												
15	176570	AA Batteries	1	3.84	#####	186 12th S	#####												
16	176571	Lightning C	1	14.95	#####	253 Johns	#####												
17	176572	Apple Airpo	1	150	4/4/2019	149 Dogwo	#####												





DATA CLEANING

Reviews.txt:

The following issues were identified in this file:

1. Invalid reviews, such as the word "Amazon," numbers, Boolean variables, or links.
2. Empty reviews.
3. While building the dashboard, I discovered 44 rows in the product column containing the word "Product," which I had to delete manually.



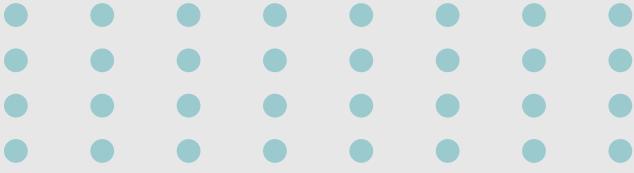
DATA CLEANING

Reviews.txt Issues:

```
AA Batteries (4-pack)
USB-C Charging Cable
USB-C Charging Cable
AAA Batteries (4-pack)
Lightning Charging Cable
LG Washing Machine
Lightning Charging Cable
Lightning Charging Cable
Wired Headphones
AA Batteries (4-pack)
Bose SoundSport Headphones
http://www.amazon.com/Kindle-Wireless-Reader-Wifi-Graphite/dp/B002Y27P3M
    Google Phone
http://www.amazon.com/Kindle-Wireless-Reader-Wifi-Graphite/dp/B002Y27P3M
    Flatscreen TV
http://www.amazon.com/Kindle-Wireless-Reader-Wifi-Graphite/dp/B002Y27P3M
    iPhone
http://www.amazon.com/Kindle-Wireless-Reader-Wifi-Graphite/dp/B002Y27P3M
    AAA Batteries (4-pack)
http://www.amazon.com/Kindle-Wireless-Reader-Wifi-Graphite/dp/B002Y27P3M
    USB-C Charging Cable
http://www.amazon.com/Kindle-Wireless-Reader-Wifi-Graphite/dp/B002Y27P3M
    Macbook Pro Laptop
```

5	Macbook Pro Laptop
5	Google Phone
5	USB-C Charging Cable
3	27in FHD Monitor
5	AAA Batteries (4-pack)
5	27in 4K Gaming Monitor
5	USB-C Charging Cable
4	Lightning Charging Cable
5	Apple Airpods Headphones
5	Google Phone
5	Wired Headphones
5	USB-C Charging Cable
5	Lightning Charging Cable
5	27in FHD Monitor
5	AAA Batteries (4-pack)
5	27in FHD Monitor
5	27in FHD Monitor
5	34in Ultrawide Monitor
5	Google Phone
5	USB-C Charging Cable





DATA CLEANING

Reviews.txt Issues:

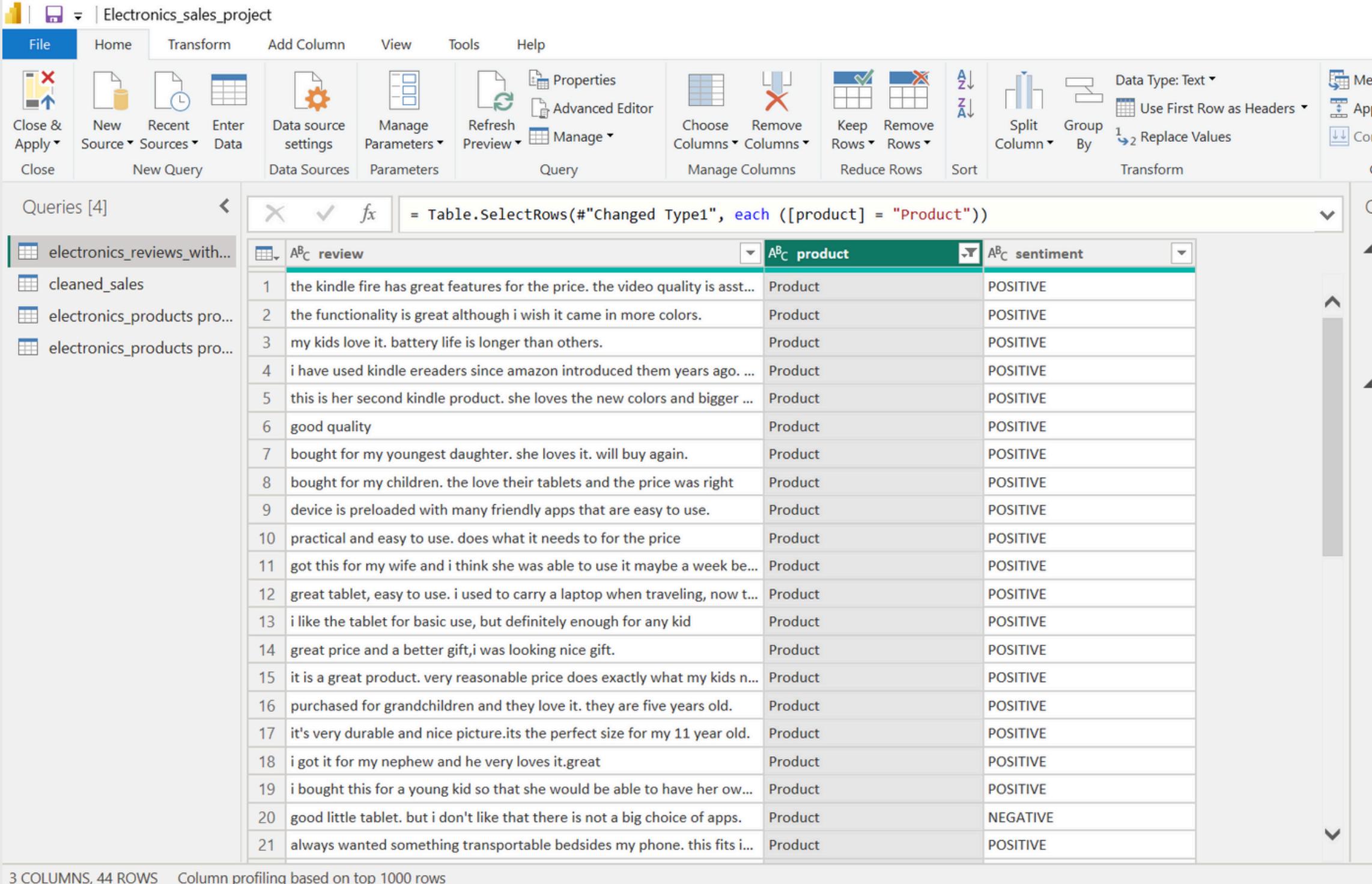
USB-C Charging Cable
Amazon Wired Headphones
Wired Headphones
Amazon USB-C Charging Cable
34in Ultrawide Monitor
Amazon USB-C Charging Cable
Flatscreen TV
Amazon iPhone
Lightning Charging Cable
Amazon AA Batteries (4-pack)
Google Phone
Amazon AA Batteries (4-pack)
USB-C Charging Cable
Amazon AAA Batteries (4-pack)
Bose SoundSport Headphones
firetablet7displaywifi8gb includesspecialoffersmagenta/5025800,84166710
enta/b018y229ou Macbook Pro Laptop
Great gift for my nieceShe is using it every day Lightning Char
This is one of the best purchases I've ever made. I used to buy books
(for a cheaper price, at that) and they're all in one place, not takin
But you do get what you pay for. Charging cable doesn't work anymore a
pack)

FALSE Lightning Charging Cable
27in 4K Gaming Monitor
TRUE 27in 4K Gaming Monitor
Apple Airpods Headphones
FALSE Wired Headphones
AAA Batteries (4-pack)
TRUE Lightning Charging Cable
iPhone
TRUE Flatscreen TV
AAA Batteries (4-pack)
TRUE 34in Ultrawide Monitor
Flatscreen TV
TRUE 27in 4K Gaming Monitor
Lightning Charging Cable
TRUE Wired Headphones
Apple Airpods Headphones
TRUE Apple Airpods Headphones
USB-C Charging Cable
TRUE 27in FHD Monitor
USB-C Charging Cable
TRUE Wired Headphones
USB-C Charging Cable
TRUE Google Phone
AAA Batteries (4-pack)
TRUE AA Batteries (4-pack)
AA Batteries (4-pack)



DATA CLEANING

Reviews.txt Issues:



The screenshot shows the Microsoft Power BI Data Editor interface. The title bar says "Electronics_sales_project". The ribbon menu includes File, Home, Transform, Add Column, View, Tools, and Help. The Home tab is selected. The toolbar contains icons for Close & Apply, New Source, Recent Sources, Enter Data, Data source settings, Manage Parameters, Refresh Preview, Properties Advanced Editor, Choose Columns, Remove Columns, Keep Rows, Remove Rows, Sort, Split Column, Group By, Data Type (set to Text), and Transform. The left sidebar shows "Queries [4]" with four items: "electronics_reviews_with...", "cleaned_sales", "electronics_products pro...", and "electronics_products pro...". The main area displays a table with three columns: "review", "product", and "sentiment". The table has 21 rows. The first few rows show positive reviews for Kindle products.

	review	product	sentiment
1	the kindle fire has great features for the price. the video quality is asst...	Product	POSITIVE
2	the functionality is great although i wish it came in more colors.	Product	POSITIVE
3	my kids love it. battery life is longer than others.	Product	POSITIVE
4	i have used kindle ereaders since amazon introduced them years ago. ...	Product	POSITIVE
5	this is her second kindle product. she loves the new colors and bigger ...	Product	POSITIVE
6	good quality	Product	POSITIVE
7	bought for my youngest daughter. she loves it. will buy again.	Product	POSITIVE
8	bought for my children. the love their tablets and the price was right	Product	POSITIVE
9	device is preloaded with many friendly apps that are easy to use.	Product	POSITIVE
10	practical and easy to use. does what it needs to for the price	Product	POSITIVE
11	got this for my wife and i think she was able to use it maybe a week be...	Product	POSITIVE
12	great tablet, easy to use. i used to carry a laptop when traveling, now t...	Product	POSITIVE
13	i like the tablet for basic use, but definitely enough for any kid	Product	POSITIVE
14	great price and a better gift,i was looking nice gift.	Product	POSITIVE
15	it is a great product. very reasonable price does exactly what my kids n...	Product	POSITIVE
16	purchased for grandchildren and they love it. they are five years old.	Product	POSITIVE
17	it's very durable and nice picture.its the perfect size for my 11 year old.	Product	POSITIVE
18	i got it for my nephew and he very loves it.great	Product	POSITIVE
19	i bought this for a young kid so that she would be able to have her ow...	Product	POSITIVE
20	good little tablet. but i don't like that there is not a big choice of apps.	Product	NEGATIVE
21	always wanted something transportable besides my phone. this fits i...	Product	POSITIVE

3 COLUMNS, 44 ROWS Column profiling based on top 1000 rows

DATA CLEANING

Reviews.txt python cleaning code

```
> Users > taifa > OneDrive > سطح المكتب > data analysis camp > Final project > Electronics > clean reviews.py > ...
1 import csv
2 import re
3 from textblob import TextBlob
4
5 def clean_text(text):
6     """Clean and preprocess the text while preserving its content."""
7     text = re.sub(r'^[""]+|[\""]+$', '', text) # Remove leading and trailing quotes
8     text = re.sub(r'^[^\w\s]*[\d\s]*', '', text) # Remove unwanted leading characters and numbers
9     text = re.sub(r'\.{2}', '.', text) # Replace multiple dots with a single dot
10    text = re.sub(r'!\{2\}', '!', text) # Replace multiple exclamation marks with one
11    text = re.sub(r'\?{2}', '?', text) # Replace multiple question marks with one
12    text = re.sub(r'\b(\w)\1{2}\b', r'\1', text) # Reduce repeated letters
13    text = text.lower() # Convert to lowercase
14    text = re.sub(r'http\S+|www\S+|https\S+', '', text, flags=re.MULTILINE) # Remove URLs
15    text = re.sub(r'[\x00-\x7F]+', '', text) # Remove non-printable characters
16    text = re.sub(r'[^w\s.,!?"']', '', text) # Remove special characters but keep spaces and basic punctuation
17    text = re.sub(r'\s+', ' ', text).strip() # Normalize whitespace
18    return text
19
20 def is_valid_review(review):
21     """Check if the review is valid based on custom rules."""
22     # Check if the review is not empty and not numeric or boolean
23     return review and not review.isdigit() and review not in {'TRUE', 'FALSE'}
24
25 # Define file paths
26 input_txt_file_path = 'e-reviw.txt'
27 temp_csv_file_path = 'temp_reviews.csv'
28 output_csv_file_path = 'cleaned_reviews.csv'
29 output_txt_file_path = 'cleaned_reviews.txt'
30
31 # Read the TXT file and determine headers
32 with open(input_txt_file_path, 'r', encoding='utf-8') as txt_file:
33     lines = txt_file.readlines()
34
35 if not lines:
36     raise ValueError("Input TXT file is empty or unreadable.")
37
38 # Extract headers from the first line
39 headers = lines[0].strip().split('\t')
40
41 # Write data to a temporary CSV file
42 with open(temp_csv_file_path, 'w', encoding='utf-8', newline='') as csv_file:
43     csv_writer = csv.writer(csv_file)
```

```
45     for line in lines[1:]: # Skip the header line
46         line = line.strip()
47         if not line or re.match(r'^[-_=]+$', line):
48             continue
49
50         parts = re.split(r'\t+', line)
51         if len(parts) < 2:
52             continue
53
54         review_part = parts[0].strip()
55         product_part = parts[1].strip() if len(parts) > 1 else ''
56
57         if review_part and product_part:
58             csv_writer.writerow([review_part, product_part])
59
60 # Initialize lists for cleaned data
61 cleaned_reviews = []
62 products = []
63
64 # Read the temporary CSV file and process it
65 with open(temp_csv_file_path, 'r', encoding='utf-8') as csv_file:
66     csv_reader = csv.reader(csv_file)
67     seen_rows = set() # To track and remove duplicate rows
68
69     for row in csv_reader:
70         if len(row) < 2:
71             continue
72
73         review_part = row[0].strip()
74         product_part = row[1].strip() if len(row) > 1 else ''
75
76         # Check if review is valid
77         if not is_valid_review(review_part):
78             continue
79
80         # Clean review part
81         cleaned_review = clean_text(review_part)
82
83         if cleaned_review and len(cleaned_review) > 0: # Ensure review part is not empty
84             # Use a tuple of (review, product) to track duplicates
85             row_tuple = (cleaned_review, product_part)
86
87             if row_tuple not in seen_rows:
88                 seen_rows.add(row_tuple)
89                 cleaned_reviews.append(cleaned_review)
90                 products.append(product_part)
```



DATA CLEANING

Reviews.txt python cleaning code

```
89
90 # Write cleaned data to CSV file with headers
91 with open(output_csv_file_path, 'w', encoding='utf-8', newline='') as csv_file:
92     csv_writer = csv.writer(csv_file)
93     csv_writer.writerow(headers) # Write headers
94     for review, product in zip(cleaned_reviews, products):
95         csv_writer.writerow([review, product])
96
97 # Write cleaned data to TXT file with headers
98 with open(output_txt_file_path, 'w', encoding='utf-8') as txt_file:
99     txt_file.write('\t'.join(headers) + '\n') # Write headers
100    for review, product in zip(cleaned_reviews, products):
101        txt_file.write(f'{review}\t{product}\n')
102
103 print("Conversion, cleaning, and saving completed successfully.")
104
```



DATA CLEANING

Reviews.txt result after cleaning:

File Edit View
this was a very good buy at a great price the tablet works fine for the purpose in which it was purchased and I'm very happy. AAA Batteries (4-pack)
this is a nice basic tablet for those not wanting to spend a lot of . easy to use, nice hd resolution for games and even watching netflix etc. AA Batteries (4-pack)
the battery life is amazing and quickly gets a full charge USB-C Charging Cable
i had an older fire and i must say thus one is definitely an upgrade. speed of browser and apps opening is faster. color choices are nice ! AA Batteries (4-pack)
it is an amazon amazing among many things that can be used by many people and always will be a good product to use for many people to tryout and have an important experience for their family. amazon kindle fire 16gb with side that has slot for the extra memory in the form of a memory chip. Bose SoundSport Headphones
bought this for a christmas gift, the item is great AAA Batteries (4-pack)
it has a delayed response. i can't access my email accounts unless i give amazon access to control everything. i can't put my apps on my opening page. amazon uses the washington post, i prefer the nyt. so far not a fan. USB-C Charging Cable
you can't get much better than this for the price. my only critique is that they might as well have not included the camera because it's useless, but if you're using a tablet for the camera than that is already an issue. good quality resolution, fast for internet browsing, expandable memory. lots of positives to be found here. 27in 4K Gaming Monitor
this tablet is one of the best.you won't regret buying this one.good work.amazon. Wired Headphones
just picked up from bb a couple of hours ago. screen in good and tablet seems faster than previous model possibly due to more memory. battery so far seems very good. AAA Batteries (4-pack)
i've had this tablet for several months now and have had no problems with it. 8 in screen is perfect easy to hold, not too big or too small. 16gb romabout 12gb available after updates and built in apps is good if you don't have a lot of apps or games. the ram could be bigger but it doesn't lag even with some medium gaming. 1.5ghz processor is not for heavy gaming, but for everyday use is great. the battery life is excellent i would say easily 8 hours or 5 to 6 if gaming. while this is not a hd display the colors are sharp, some glare if in the sun. camera sucks but decent for the price, no issues connecting and syncing my data to my amazon account. if you are an amazon prime member definitely buy this tablet and even if you aren't this tablet gives you a lot for the price. i wish amazon would offer more than 90 day warranty but overall very impressed and satisfied with my purchase. Apple Airpods Headphones
my only problem with this tablet is that after 6 months of use it stopped charging. Wired Headphones
good product if you don't want to spend money on ipad. great just for surfing internet. ThinkPad Laptop
bought as a mother's day gift. this is great for someone who does not already have a tablet, and is a bit uncomfortable with technology. the tablet guides you pretty well, and once we had it setup with overdrive, the recipient was very happy. free library kindle books! ThinkPad Laptop
i love reading my books on this kindle. a little slow on processing on the web. Bose SoundSport Headphones
i have enjoyed my kindle since purchasing it over 5 months ago. as a law student it's a great way to have all of my books on one device and accessible on the go. Lightning Charging Cable
buy a heavy duty screen protector had ours less than a month glass is shattered unable to find a place to fix it . do not buy this for kids grandson is 11 .
27in FHD Monitor
just love the new kindle fire hd8 does all that i want and then some 20in Monitor



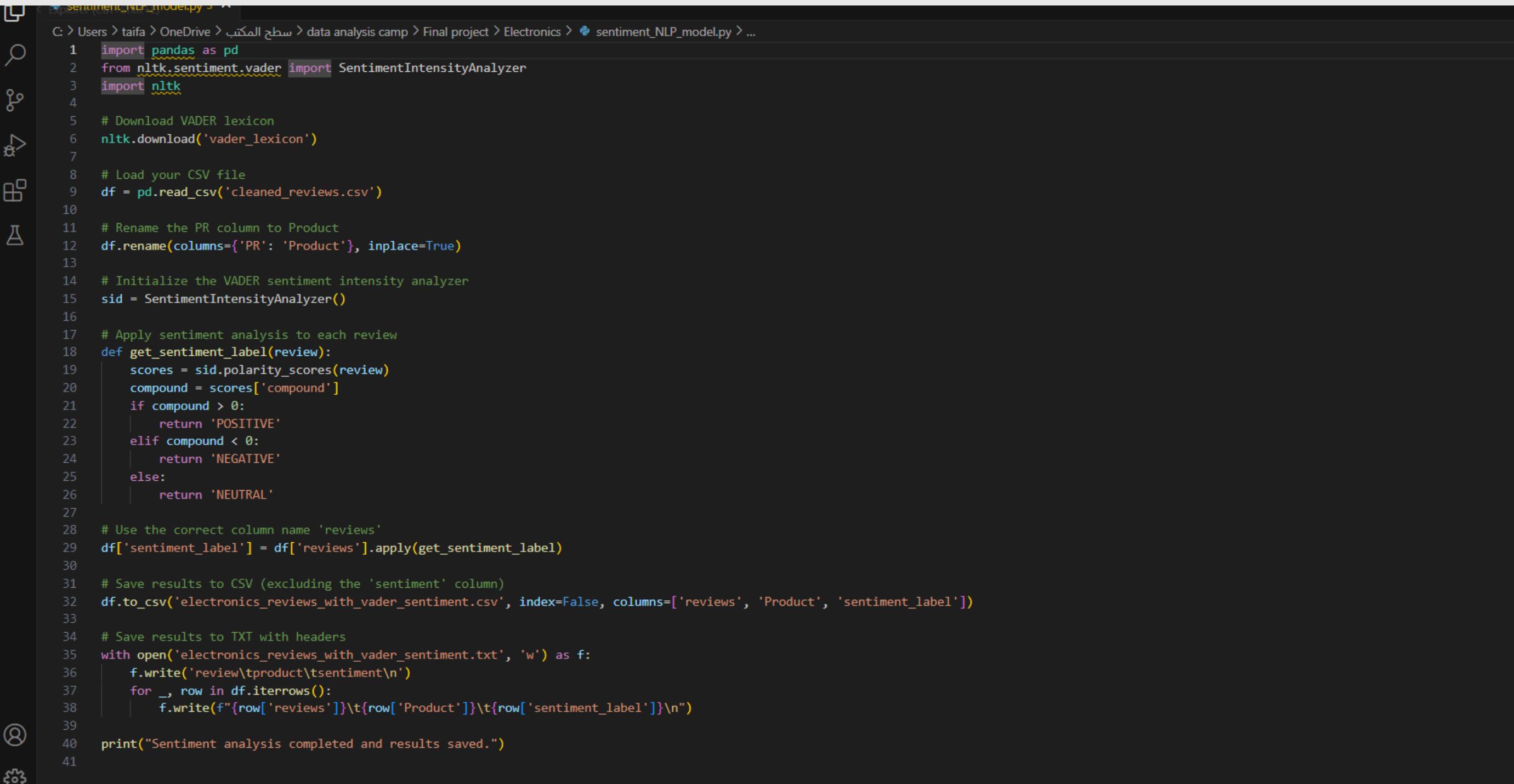
••••• NLP: SENTIMENT ANALYSIS USING VADER

In this phase, I utilized the VADER (Valence Aware Dictionary and sEntiment Reasoner) model, a pre-trained sentiment analysis tool specifically designed to analyze social media text. VADER is capable of detecting sentiments expressed in text and categorizes them into Positive, Neutral, or Negative, which I applied to the customer reviews to extract and analyze their sentiments.



NLP: SENTIMENT ANALYSIS USING VADER

NLP model python code:



The screenshot shows a code editor window with a dark theme. The file is named `sentiment_NLP_model.py`. The code implements a VADER-based sentiment analysis pipeline. It starts by importing pandas and the SentimentIntensityAnalyzer from nltk.sentiment.vader. It then downloads the VADER lexicon. Next, it loads a CSV file of cleaned reviews. The PR column is renamed to Product. A VADER sentiment intensity analyzer is initialized. A function `get_sentiment_label` is defined to map compound scores to sentiment labels ('POSITIVE', 'NEGATIVE', or 'NEUTRAL'). The 'reviews' column is renamed to 'sentiment_label'. Finally, the results are saved to a CSV and a TXT file.

```
1 import pandas as pd
2 from nltk.sentiment.vader import SentimentIntensityAnalyzer
3 import nltk
4
5 # Download VADER lexicon
6 nltk.download('vader_lexicon')
7
8 # Load your CSV file
9 df = pd.read_csv('cleaned_reviews.csv')
10
11 # Rename the PR column to Product
12 df.rename(columns={'PR': 'Product'}, inplace=True)
13
14 # Initialize the VADER sentiment intensity analyzer
15 sid = SentimentIntensityAnalyzer()
16
17 # Apply sentiment analysis to each review
18 def get_sentiment_label(review):
19     scores = sid.polarity_scores(review)
20     compound = scores['compound']
21     if compound > 0:
22         return 'POSITIVE'
23     elif compound < 0:
24         return 'NEGATIVE'
25     else:
26         return 'NEUTRAL'
27
28 # Use the correct column name 'reviews'
29 df['sentiment_label'] = df['reviews'].apply(get_sentiment_label)
30
31 # Save results to CSV (excluding the 'sentiment' column)
32 df.to_csv('electronics_reviews_with_vader_sentiment.csv', index=False, columns=['reviews', 'Product', 'sentiment_label'])
33
34 # Save results to TXT with headers
35 with open('electronics_reviews_with_vader_sentiment.txt', 'w') as f:
36     f.write('review\tproduct\tsentiment\n')
37     for _, row in df.iterrows():
38         f.write(f"{row['reviews']}\t{row['Product']}\t{row['sentiment_label']}\n")
39
40 print("Sentiment analysis completed and results saved.")
```



NLP: SENTIMENT ANALYSIS USING VADER

Review.txt with sentiments:

```
review product sentiment
this product so far has not disappointed. my children love to use it and i like the ability to monitor control what content they see with ease. USB-C
Charging Cable POSITIVE
great for beginner or experienced person. bought as a gift and she loves it      Bose SoundSport Headphones      POSITIVE
inexpensive tablet for him to use and learn on, step up from the nabi. he was thrilled with it, learn how to skype on it already.      Google Phone
      POSITIVE
i've had my fire hd 8 two weeks now and i love it. this tablet is a great value.we are prime members and that is where this tablet shines. i love being able
to easily access all of the prime content as well as movies you can download and watch laterthis has a 1280800 screen which has some really nice look to it
its nice and crisp and very bright infact it is brighter then the ipad pro costing 900 base model. the build on this fire is insanely awesome running at
only 7.7mm thick and the smooth glossy feel on the back it is really amazing to hold its like the futuristic tab in ur hands.      Wired Headphones
      POSITIVE
i bought this for my grand daughter when she comes over to visit. i set it up with her as the user, entered her age and name and now amazon makes sure that
she only accesses sites and content that are appropriate to her age. simple to do and she loves the capabilities. i also bought and installed a 64gig sd
card which gives this little tablet plenty of storage. for the price i think this tablet is best one out there. you can spend hundreds of dollars more for
additional speed and capacity but when it comes to the basics this tablets does everything that most people will ever need at a fraction of the cost.
      Wired Headphones      POSITIVE
this amazon fire 8 inch tablet is the perfect size. i purchased it for my husband so that he has a bigger screen than just his phone. he had gotten me one a
few years ago so i knew it would be a good purchase.      USB-C Charging Cable      POSITIVE
great for ereading on the go, nice and light weight, and for the price point given, definitely worth the purchase.      Bose SoundSport Headphones
      POSITIVE
i gave this as a christmas gift to my inlaws, husband and uncle. they loved it and how easy they are to use with fantastic features!      USB-C Charging Cable
      POSITIVE
great as a device to read books. i like that it links with my borrowed library ebooks. switched from another popular tablet brand and i am happy with the
choice i made. it took some time to get books from my previous nonkindle reader, but finally figured out a way! Macbook Pro Laptop      POSITIVE
i love ordering books and reading them with the reader.      Wired Headphones      POSITIVE
not easy for elderly users cease of ads that pop up.      Google Phone      NEGATIVE
excellent product. easy to use, large screen makes watching movies and reading easier.      Lightning Charging Cable      POSITIVE
wanted my father to have his first tablet and this is a very good value. he can watch movies and play a few games. easy enough for him to use. 27in 4K
Gaming Monitor      POSITIVE
simply does everything i need. thank youand silk works wonders AA Batteries (4-pack)      POSITIVE
got it as a present and love the size of the screen      Lightning Charging Cable      POSITIVE
the kindle is easiest to use, graphics and screen crisp, clear, brilliant colors.      Apple Airpods Headphones      POSITIVE
nice reader. almost perfect for what i wantneed. good bargain      USB-C Charging Cable      POSITIVE
i really like this tablet. i would have given 5 stars but sometimes you have to push start several times after you unlock the screen and it is a little
```





DATABASE BUILDING

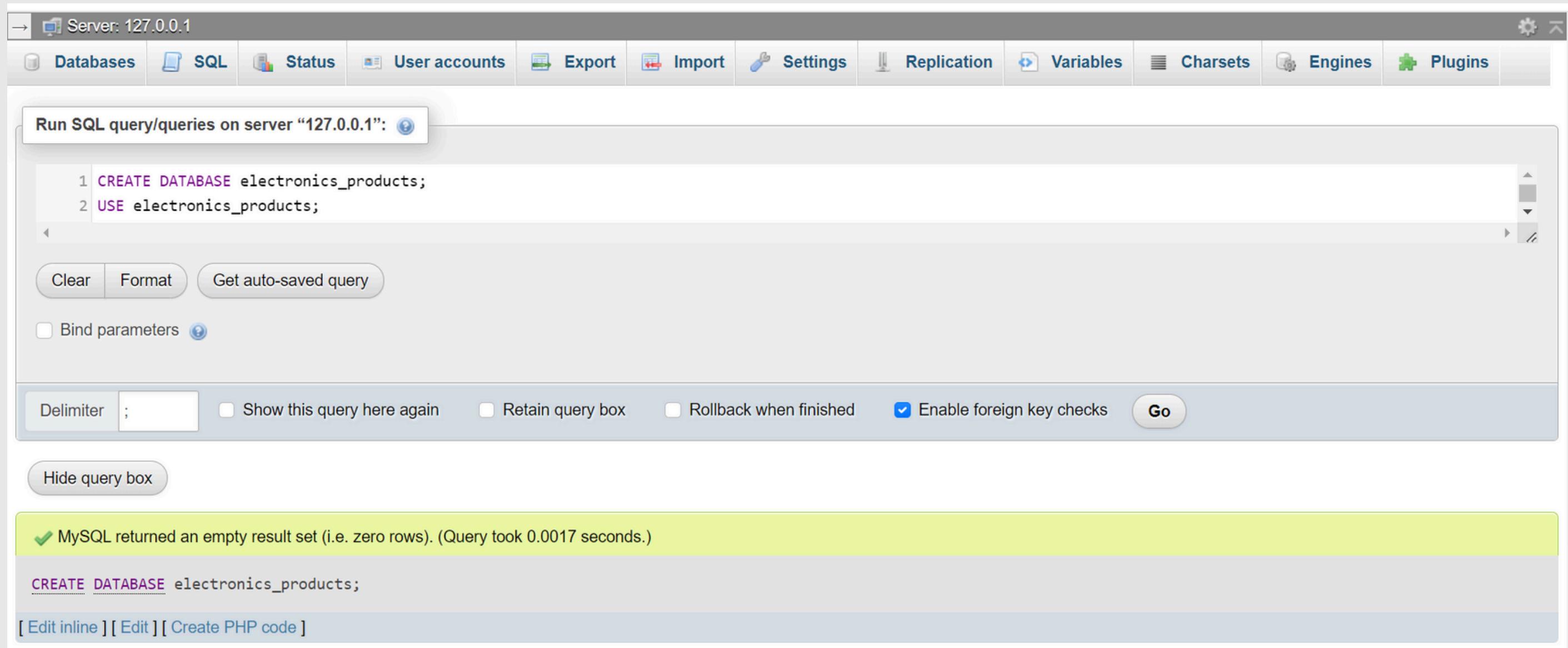
In this phase, I developed the third data source, a database focused on products. The database consists of two tables:

1. Products
2. Product Categories



DATABASE BUILDING

Creating the database:



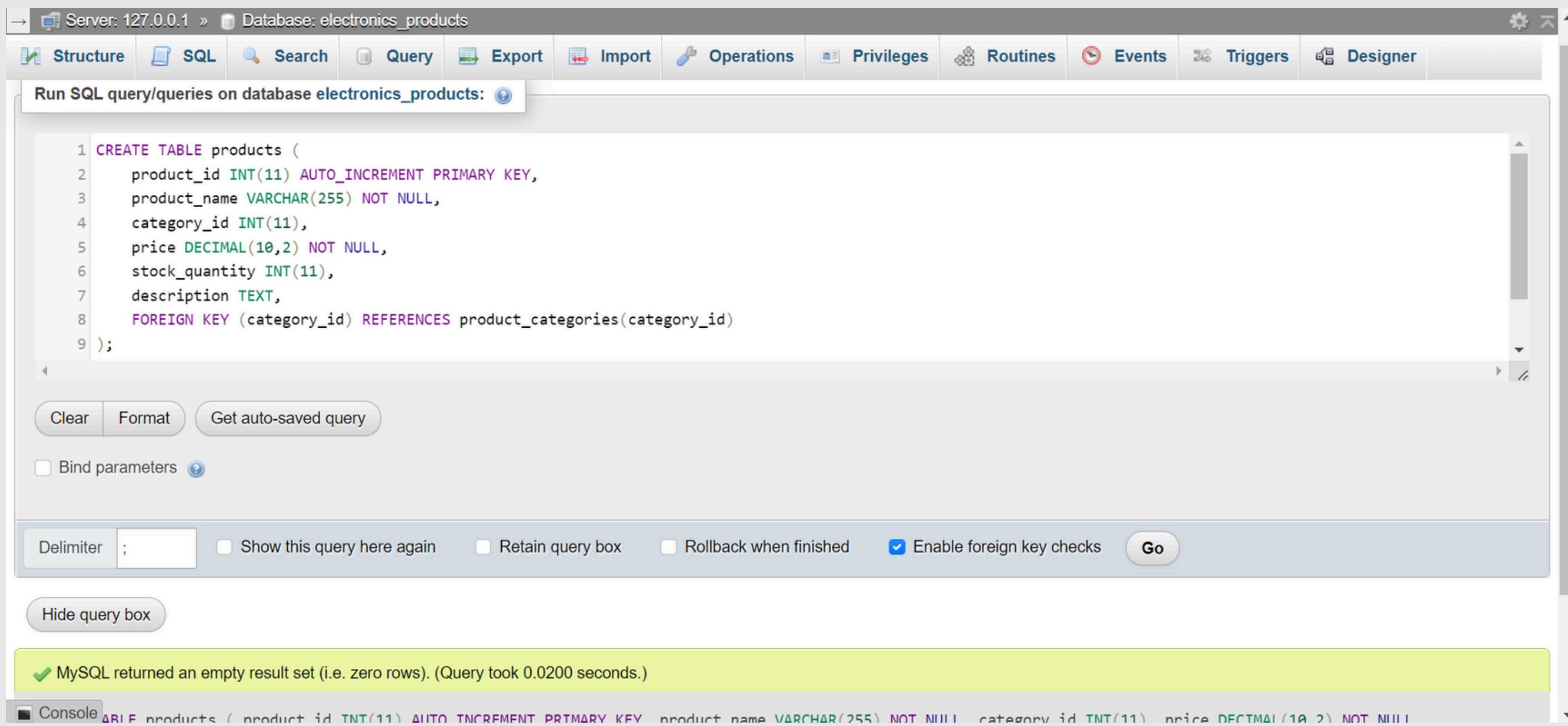
The screenshot shows the MySQL Workbench interface with the following details:

- Server:** 127.0.0.1
- Tab Bar:** Databases, SQL, Status, User accounts, Export, Import, Settings, Replication, Variables,Charsets, Engines, Plugins
- SQL Editor:** Run SQL query/queries on server "127.0.0.1":
1 CREATE DATABASE electronics_products;
2 USE electronics_products;
- Buttons:** Clear, Format, Get auto-saved query, Bind parameters
- Query Options:** Delimiter ;, Show this query here again, Retain query box, Rollback when finished, Enable foreign key checks (checked), Go
- Result Panel:** MySQL returned an empty result set (i.e. zero rows). (Query took 0.0017 seconds.)
CREATE DATABASE electronics_products;
- Actions:** [Edit inline], [Edit], [Create PHP code]



DATABASE BUILDING

Creating products table:



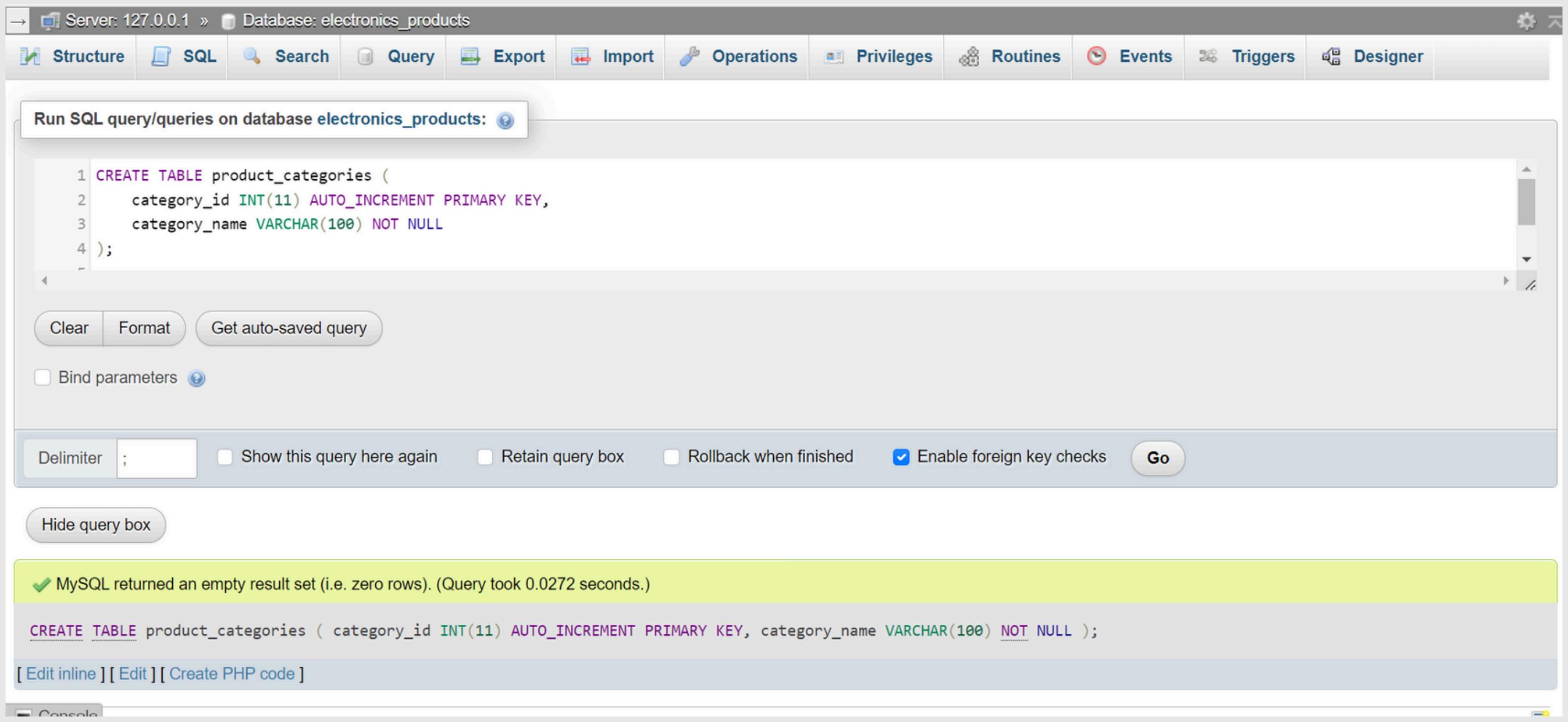
The screenshot shows the MySQL Workbench interface with the following details:

- Server:** 127.0.0.1
- Database:** electronics_products
- Toolbar:** Structure, SQL, Search, Query, Export, Import, Operations, Privileges, Routines, Events, Triggers, Designer.
- Query Editor:** Run SQL query/queries on database electronics_products:
The code is:

```
1 CREATE TABLE products (
2     product_id INT(11) AUTO_INCREMENT PRIMARY KEY,
3     product_name VARCHAR(255) NOT NULL,
4     category_id INT(11),
5     price DECIMAL(10,2) NOT NULL,
6     stock_quantity INT(11),
7     description TEXT,
8     FOREIGN KEY (category_id) REFERENCES product_categories(category_id)
9 );
```
- Buttons:** Clear, Format, Get auto-saved query, Bind parameters.
- Options:** Delimiter ;, Show this query here again, Retain query box, Rollback when finished, Enable foreign key checks (checked), Go button.
- Status Bar:** MySQL returned an empty result set (i.e. zero rows). (Query took 0.0200 seconds.)
- Console:** Shows the executed SQL command.

DATABASE BUILDING

Creating Product Categories table:



The screenshot shows the MySQL Workbench interface with the following details:

- Server:** 127.0.0.1
- Database:** electronics_products
- Toolbar:** Structure, SQL, Search, Query, Export, Import, Operations, Privileges, Routines, Events, Triggers, Designer.
- Query Editor:** A large text area containing the SQL code for creating the table:

```
1 CREATE TABLE product_categories (
2     category_id INT(11) AUTO_INCREMENT PRIMARY KEY,
3     category_name VARCHAR(100) NOT NULL
4 );
```
- Buttons:** Clear, Format, Get auto-saved query, Bind parameters.
- Query Options:** Delimiter (set to ;), Show this query here again (unchecked), Retain query box (unchecked), Rollback when finished (unchecked), Enable foreign key checks (checked).
- Result Panel:** A green box at the bottom indicates: "MySQL returned an empty result set (i.e. zero rows). (Query took 0.0272 seconds.)". Below it, the executed SQL command is shown: `CREATE TABLE product_categories (category_id INT(11) AUTO_INCREMENT PRIMARY KEY, category_name VARCHAR(100) NOT NULL);`. There are also links to [Edit inline], [Edit], and [Create PHP code].



DATABASE BUILDING

Inserting values to the tables:

Server: 127.0.0.1 » Database: electronics_products

Structure SQL Search Query Export Import Operations Privileges

Run SQL query/queries on database electronics_products:

```
1 INSERT INTO product_categories (category_name) VALUES
2 ('Accessories'),
3 ('Headphones'),
4 ('Phones'),
5 ('Laptops'),
6 ('Monitors'),
7 ('Batteries'),
8 ('Televisions'),
9 ('Appliances');
```

Clear Format Get auto-saved query

Bind parameters

Delimiter : Show this query here again Retain query box Rollback when finished Enable

Hide query box

8 rows inserted.

Console id: 8 (Query took 0.0073 seconds)

Server: 127.0.0.1 » Database: electronics_products

Structure SQL Search Query Export Import Operations Privileges

Run SQL query/queries on database electronics_products:

```
1 INSERT INTO products (product_name, category_id, price, stock_quantity, description) VALUES
2 ('USB-C Charging Cable', 1, 11.95, 100, 'High-quality USB-C charging cable.'),
3 ('Bose SoundSport Headphones', 2, 99.99, 50, 'Comfortable and durable headphones.'),
4 ('Google Phone', 3, 600.00, 30, 'Latest Google smartphone.'),
5 ('Wired Headphones', 2, 11.99, 75, 'Affordable wired headphones.'),
6 ('Macbook Pro Laptop', 4, 1700.00, 20, 'High-performance laptop.'),
7 ('Lightning Charging Cable', 1, 14.95, 100, 'Durable lightning charging cable.'),
8 ('27in 4K Gaming Monitor', 5, 389.99, 15, 'High-resolution gaming monitor.'),
9 ('AA Batteries (4-pack)', 6, 3.84, 200, 'Pack of four AA batteries.'),
10 ('Apple Airpods Headphones', 2, 150.00, 40, 'Wireless earbuds by Apple.'),
11 ('iPhone', 3, 700.00, 25, 'Latest iPhone model.'),
12 ('Flatscreen TV', 7, 300.00, 10, 'Modern flatscreen TV.'),
13 ('20in Monitor', 5, 109.99, 30, 'Compact 20-inch monitor.'),
14 ('LG Dryer', 8, 600.00, 10, 'Efficient LG dryer.'),
15 ('ThinkPad Laptop', 4, 999.99, 25, 'Reliable ThinkPad laptop.'),
16 ('Vareebadd Phone', 3, 400.00, 20, 'Affordable Vareebadd smartphone.'),
17 ('LG Washing Machine', 8, 600.00, 10, 'Durable LG washing machine.'),
18 ('34in Ultrawide Monitor', 5, 379.99, 15, 'Wide 34-inch monitor.'),
19 ('27in FHD Monitor', 5, 149.99, 20, 'Full HD 27-inch monitor.'),
20 ('AAA Batteries (4-pack)', 6, 2.99, 150, 'Pack of four AAA batteries.');
```

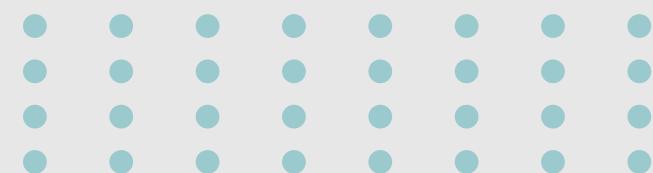
Console Format Get auto-saved query



DATABASE BUILDING

Tables after inserting values:

Database: electronics_products » Table: products						
	product_id	product_name	category_id	price	stock_quantity	description
Delete	1	USB-C Charging Cable	1	11.95	100	High-quality USB-C charging cable.
Delete	2	Bose SoundSport Headphones	2	99.99	50	Comfortable and durable headphones.
Delete	3	Google Phone	3	600.00	30	Latest Google smartphone.
Delete	4	Wired Headphones	2	11.99	75	Affordable wired headphones.
Delete	5	Macbook Pro Laptop	4	1700.00	20	High-performance laptop.
Delete	6	Lightning Charging Cable	1	14.95	100	Durable lightning charging cable.
Delete	7	27in 4K Gaming Monitor	5	389.99	15	High-resolution gaming monitor.
Delete	8	AA Batteries (4-pack)	6	3.84	200	Pack of four AA batteries.
Delete	9	Apple Airpods Headphones	2	150.00	40	Wireless earbuds by Apple.
Delete	10	iPhone	3	700.00	25	Latest iPhone model.
Delete	11	Flatscreen TV	7	300.00	10	Modern flatscreen TV.
Delete	12	20in Monitor	5	109.99	30	Compact 20-inch monitor.
Delete	13	LG Dryer	8	600.00	10	Efficient LG dryer.
Delete	14	ThinkPad Laptop	4	999.99	25	Reliable ThinkPad laptop.
Delete	15	Vareebadd Phone	3	400.00	20	Affordable Vareebadd smartphone.
Delete	16	LG Washing Machine	8	600.00	10	Durable LG washing machine.
Delete	17	34in Ultrawide Monitor	5	379.99	15	Wide 34-inch monitor.
Delete	18	27in FHD Monitor	5	149.99	20	Full HD 27-inch monitor.
Delete	19	AAA Batteries (4-pack)	6	2.99	150	Pack of four AAA batteries.



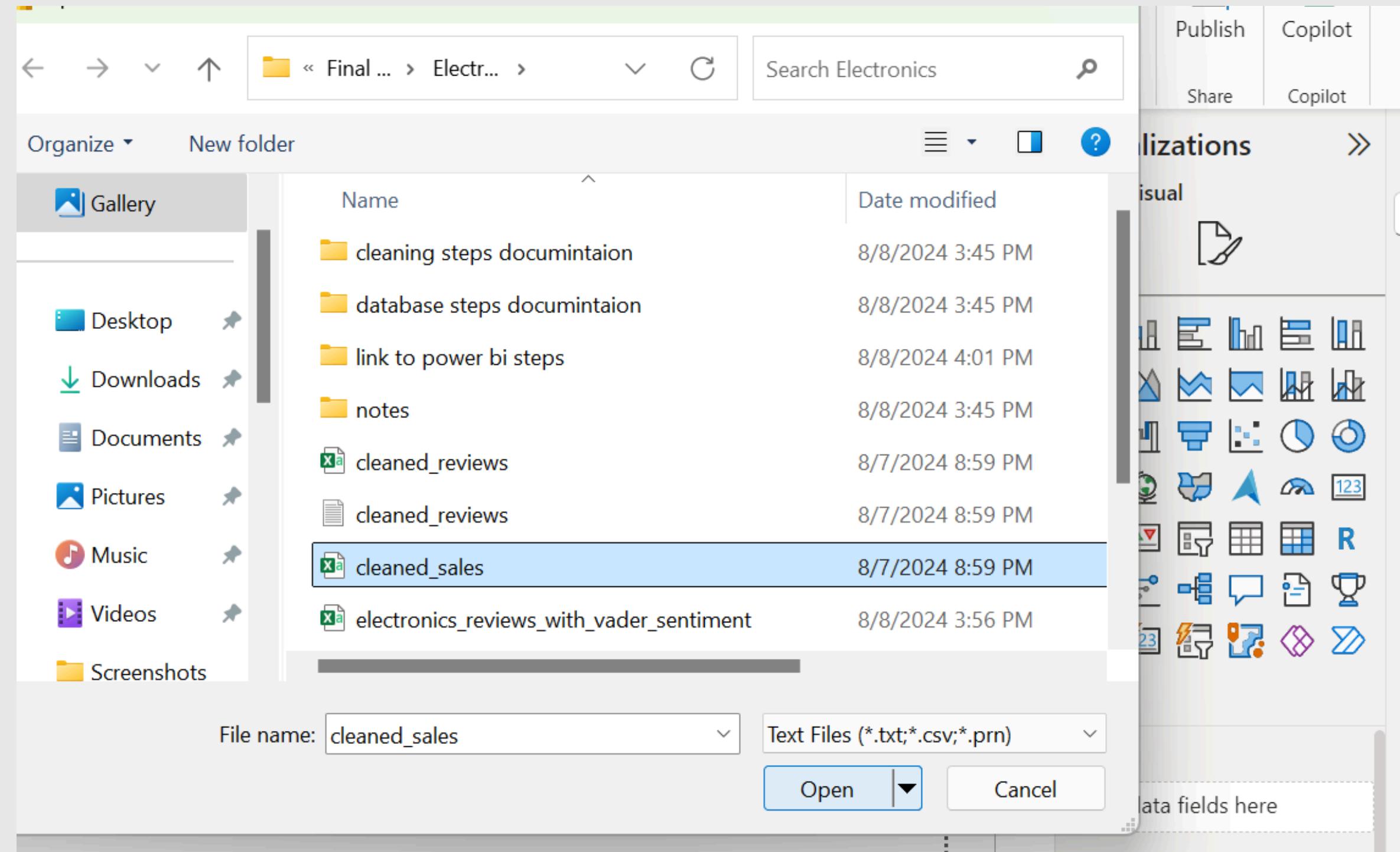
LINKING DATA SOURCES TO POWER BI

In this phase, I successfully linked the sales.csv and reviews.txt files to Power BI. However, I encountered an issue with connecting the database, which I managed to resolve.



LINKING DATA SOURCES TO POWER BI

Sales.csv linking:



LINKING DATA SOURCES TO POWER BI

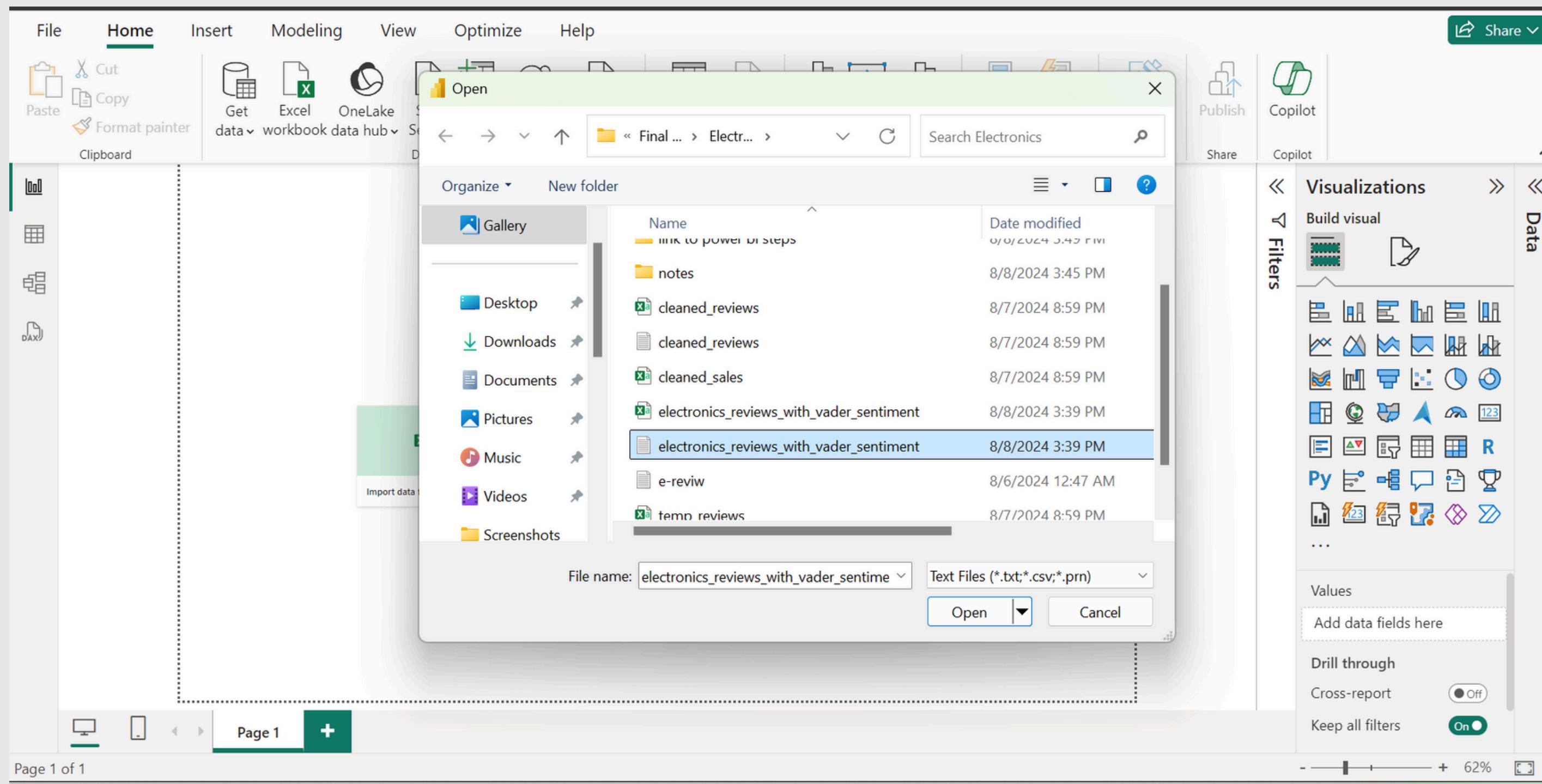
Sales.csv linking:

The screenshot shows the Power BI Data view interface. On the left, there's a navigation bar with Home, Insert, Cut, Copy, Format painter, Get data, and Clipboard options. The main area displays a preview of a CSV file named "cleaned_sales.csv". The preview includes settings for File Origin (1252: Western European (Windows)), Delimiter (Comma), and Data Type Detection (Based on first 200 rows). The data table has columns: Order ID, Product, Quantity Ordered, Price Each, Order Date, Purchase Address, and Order Time. Below the table, a note says "The data in the preview has been truncated due to size limits." At the bottom, there are buttons for Extract Table Using Examples, Load, Transform Data, and Cancel.

Order ID	Product	Quantity Ordered	Price Each	Order Date	Purchase Address	Order Time
176558	USB-C Charging Cable	2	11.95	4/19/2019	917 1st St, Dallas, TX 75001	8:46:00 AM
176559	Bose SoundSport Headphones	1	99.99	4/7/2019	682 Chestnut St, Boston, MA 02215	10:30:00 PM
176560	Google Phone	1	600	4/12/2019	669 Spruce St, Los Angeles, CA 90001	2:38:00 PM
176560	Wired Headphones	1	11.99	4/12/2019	669 Spruce St, Los Angeles, CA 90001	2:38:00 PM
176561	Wired Headphones	1	11.99	4/30/2019	333 8th St, Los Angeles, CA 90001	9:27:00 AM
176562	USB-C Charging Cable	1	11.95	4/29/2019	381 Wilson St, San Francisco, CA 94016	1:03:00 PM
176563	Bose SoundSport Headphones	1	99.99	4/2/2019	668 Center St, Seattle, WA 98101	7:46:00 AM
176564	USB-C Charging Cable	1	11.95	4/12/2019	790 Ridge St, Atlanta, GA 30301	10:58:00 AM
176565	Macbook Pro Laptop	1	1700	4/24/2019	915 Willow St, San Francisco, CA 94016	10:38:00 AM
176566	Wired Headphones	1	11.99	4/8/2019	83 7th St, Boston, MA 02215	2:05:00 PM
176567	Google Phone	1	600	4/18/2019	444 7th St, Los Angeles, CA 90001	5:18:00 PM
176568	Lightning Charging Cable	1	14.95	4/15/2019	438 Elm St, Seattle, WA 98101	12:18:00 PM
176569	27in 4K Gaming Monitor	1	389.99	4/16/2019	657 Hill St, Dallas, TX 75001	7:23:00 PM
176570	AA Batteries (4-pack)	1	3.84	4/22/2019	186 12th St, Dallas, TX 75001	3:09:00 PM
176571	Lightning Charging Cable	1	14.95	4/19/2019	253 Johnson St, Atlanta, GA 30301	2:29:00 PM
176572	Apple Airpods Headphones	1	150	4/4/2019	149 Dogwood St, New York City, NY 10001	8:30:00 PM
176573	USB-C Charging Cable	1	11.95	4/27/2019	214 Chestnut St, San Francisco, CA 94016	6:41:00 PM
176574	Google Phone	1	600	4/3/2019	20 Hill St, Los Angeles, CA 90001	7:42:00 PM
176574	USB-C Charging Cable	1	11.95	4/3/2019	20 Hill St, Los Angeles, CA 90001	7:42:00 PM
176575	AAA Batteries (4-pack)	1	2.99	4/27/2019	433 Hill St, New York City, NY 10001	12:30:00 AM

LINKING DATA SOURCES TO POWER BI

Reviews.txt linking:



LINKING DATA SOURCES TO POWER BI

Reviews.txt linking:

The screenshot shows the Power BI Data Load Preview window. The title bar says "electronics_reviews_with_vader_sentiment.txt". The window contains three tabs: "File Origin" (set to 1252: Western European (Windows)), "Delimiter" (set to Tab), and "Data Type Detection" (set to Based on first 200 rows). Below these tabs is a preview table with three columns: Column1, Column2, and Column3. The data in the preview table is as follows:

Column1	Column2	Column3
review	product	sentiment
this product so far has not disappointed. my children lo...	USB-C Charging Cable	POSITIVE
great for beginner or experienced person. bought as a g...	Bose SoundSport Headphones	POSITIVE
inexpensive tablet for him to use and learn on, step up...	Google Phone	POSITIVE
i've had my fire hd 8 two weeks now and i love it. this t...	Wired Headphones	POSITIVE
i bought this for my grand daughter when she comes o...	Wired Headphones	POSITIVE
this amazon fire 8 inch tablet is the perfect size. i purch...	USB-C Charging Cable	POSITIVE
great for ereading on the go, nice and light weight, and...	Bose SoundSport Headphones	POSITIVE
i gave this as a christmas gift to my inlaws, husband an...	USB-C Charging Cable	POSITIVE
great as a device to read books. i like that it links with...	Macbook Pro Laptop	POSITIVE
i love ordering books and reading them with the reader.	Wired Headphones	POSITIVE
not easy for elderly users cease of ads that pop up.	Google Phone	NEGATIVE
excellent product. easy to use, large screen makes watc...	Lightning Charging Cable	POSITIVE
wanted my father to have his first tablet and this is a ve...	27in 4K Gaming Monitor	POSITIVE
simply does everything i need. thank youand silk works...	AA Batteries (4-pack)	POSITIVE
got it as a present and love the size of the screen	Lightning Charging Cable	POSITIVE
the kindle is easiest to use, graphics and screen crisp, cl...	Apple Airpods Headphones	POSITIVE
nice reader. almost perfect for what i wantneed. good...	USB-C Charging Cable	POSITIVE
i really like this tablet. i would have given 5 stars but so...	Google Phone	NEGATIVE
great video quality lots of fun apps fun for the whole fa...	USB-C Charging Cable	POSITIVE

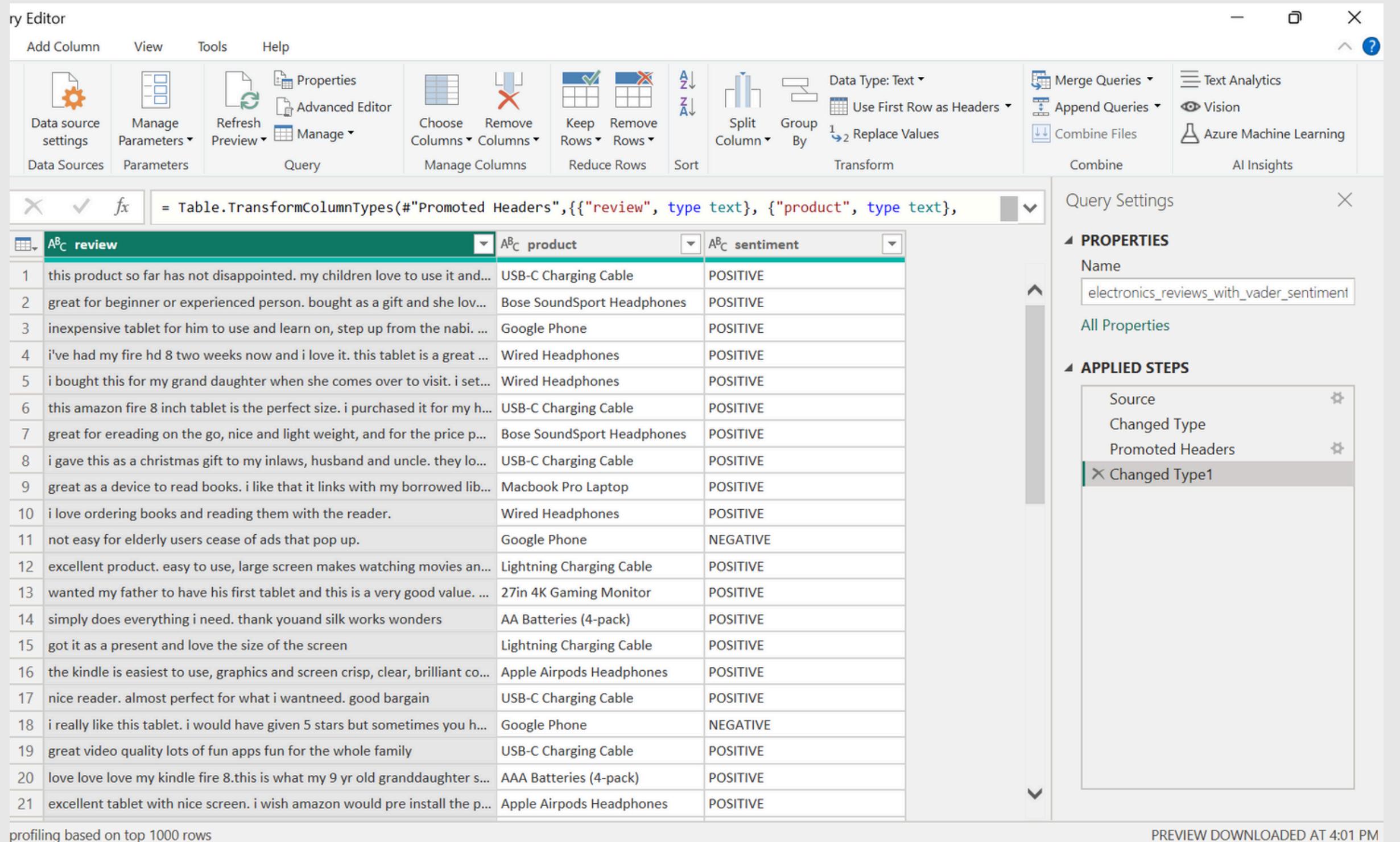
A note at the bottom left of the preview area states: "The data in the preview has been truncated due to size limits."

At the bottom right of the preview area are three buttons: "Extract Table Using Examples", "Load", and "Transform Data".

To the right of the preview window is a vertical pane titled "Visualizations" containing various chart and report icons. At the bottom of this pane are buttons for "Drill through", "Cross-report", and "Keep all filters".

LINKING DATA SOURCES TO POWER BI

Reviews.txt linking:

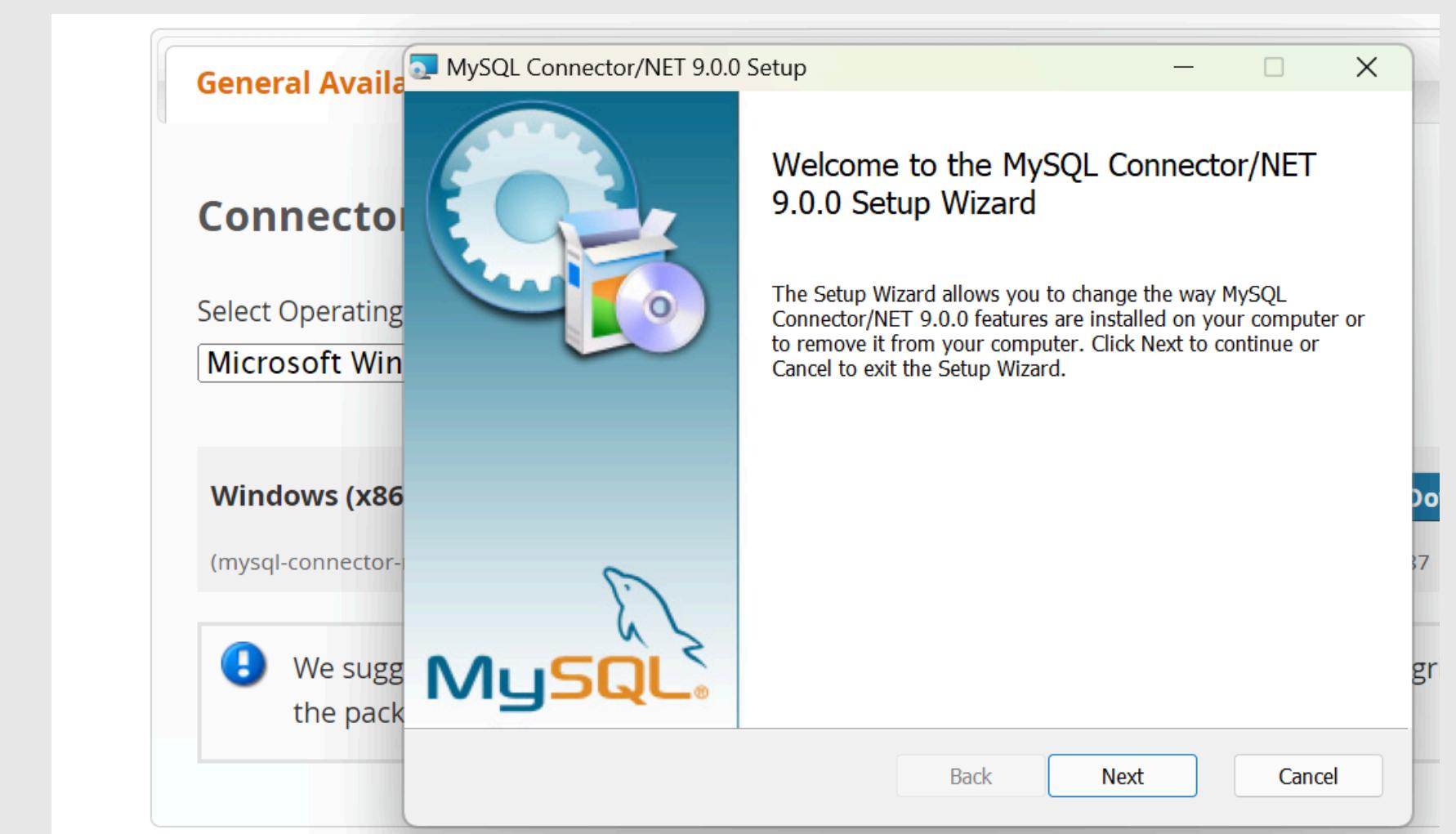
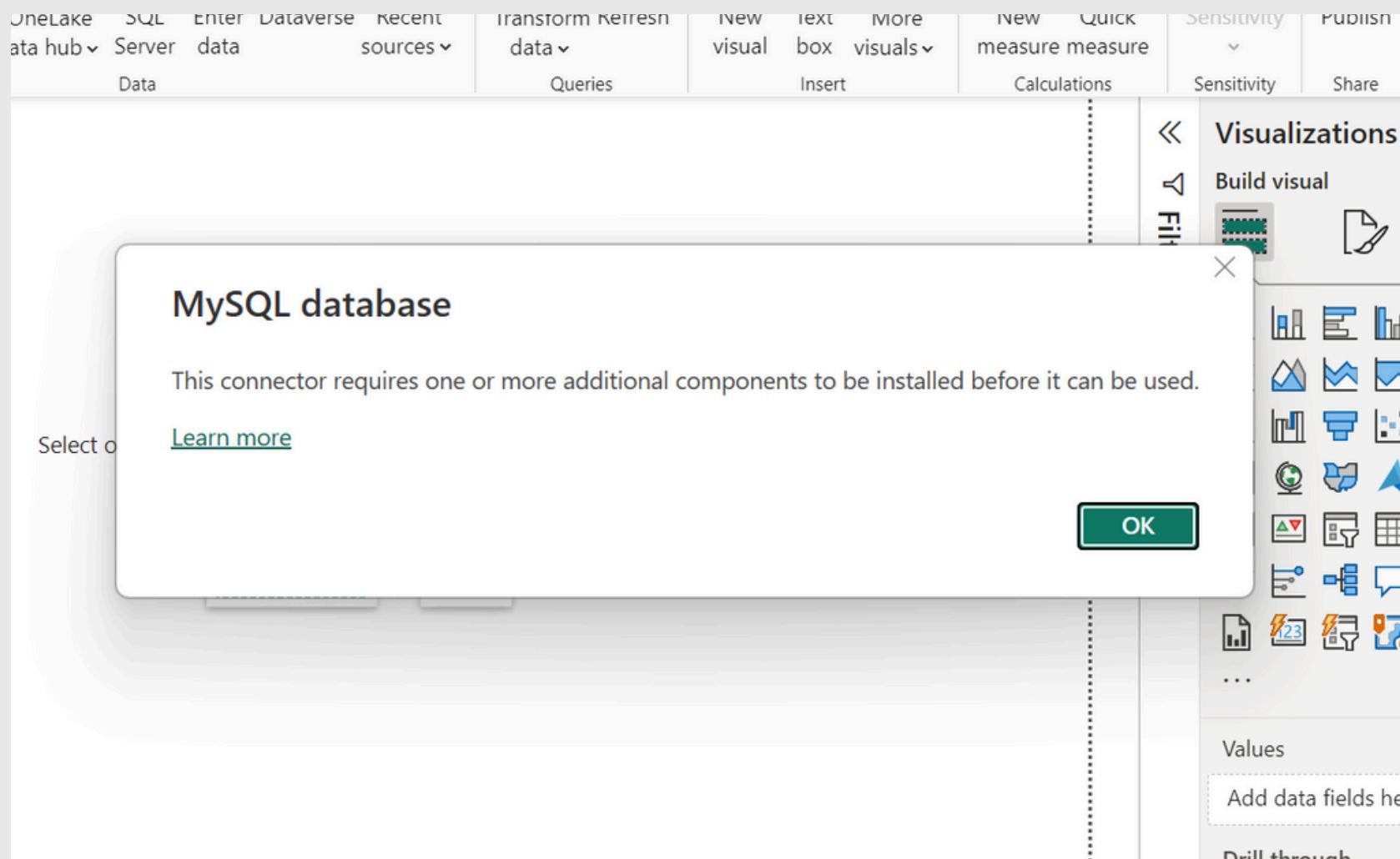


After linking the reviews.txt file, I addressed the issue of readers being in the first row by using the "Use First Row as Headers" feature.

LINKING DATA SOURCES TO POWER BI

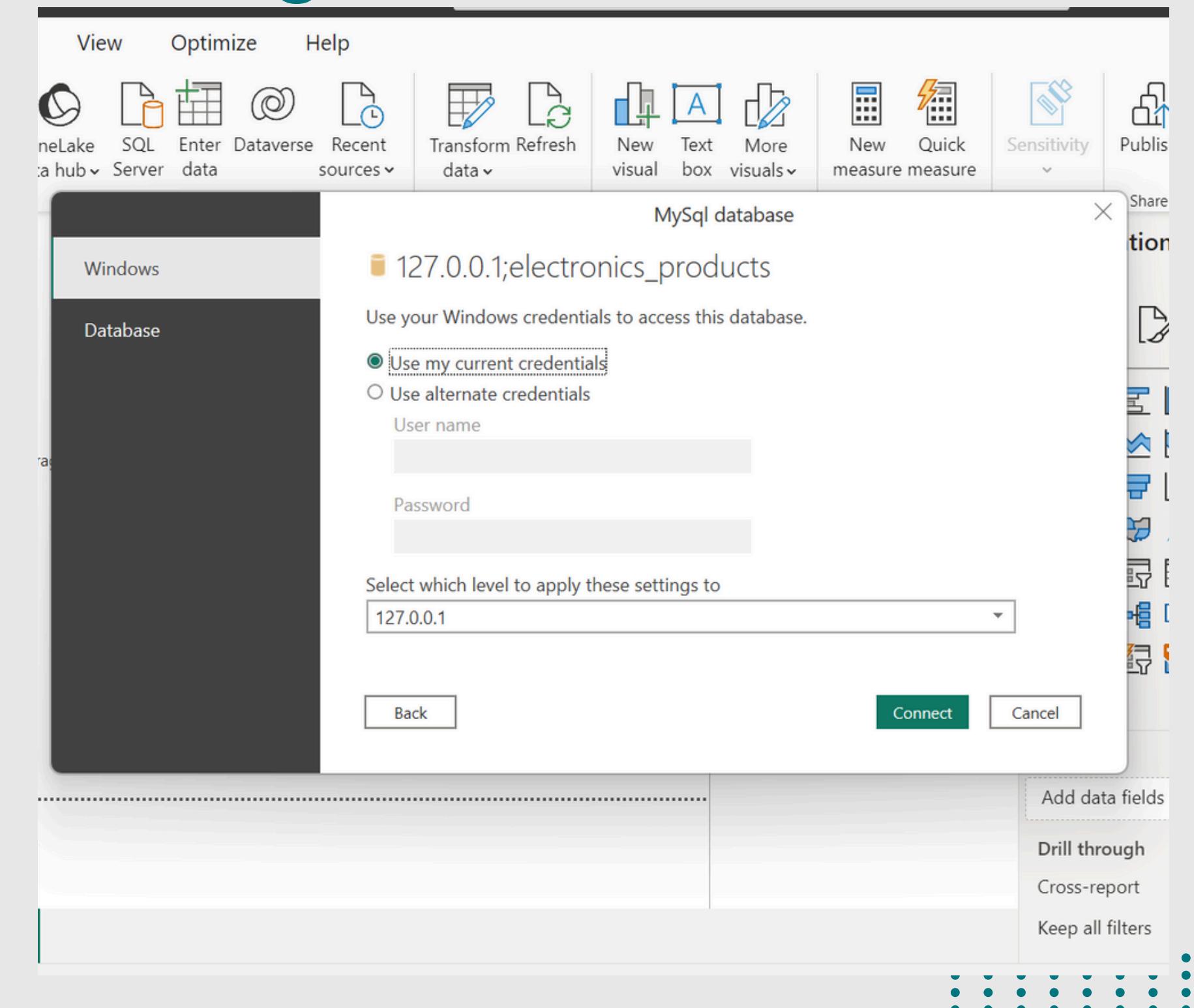
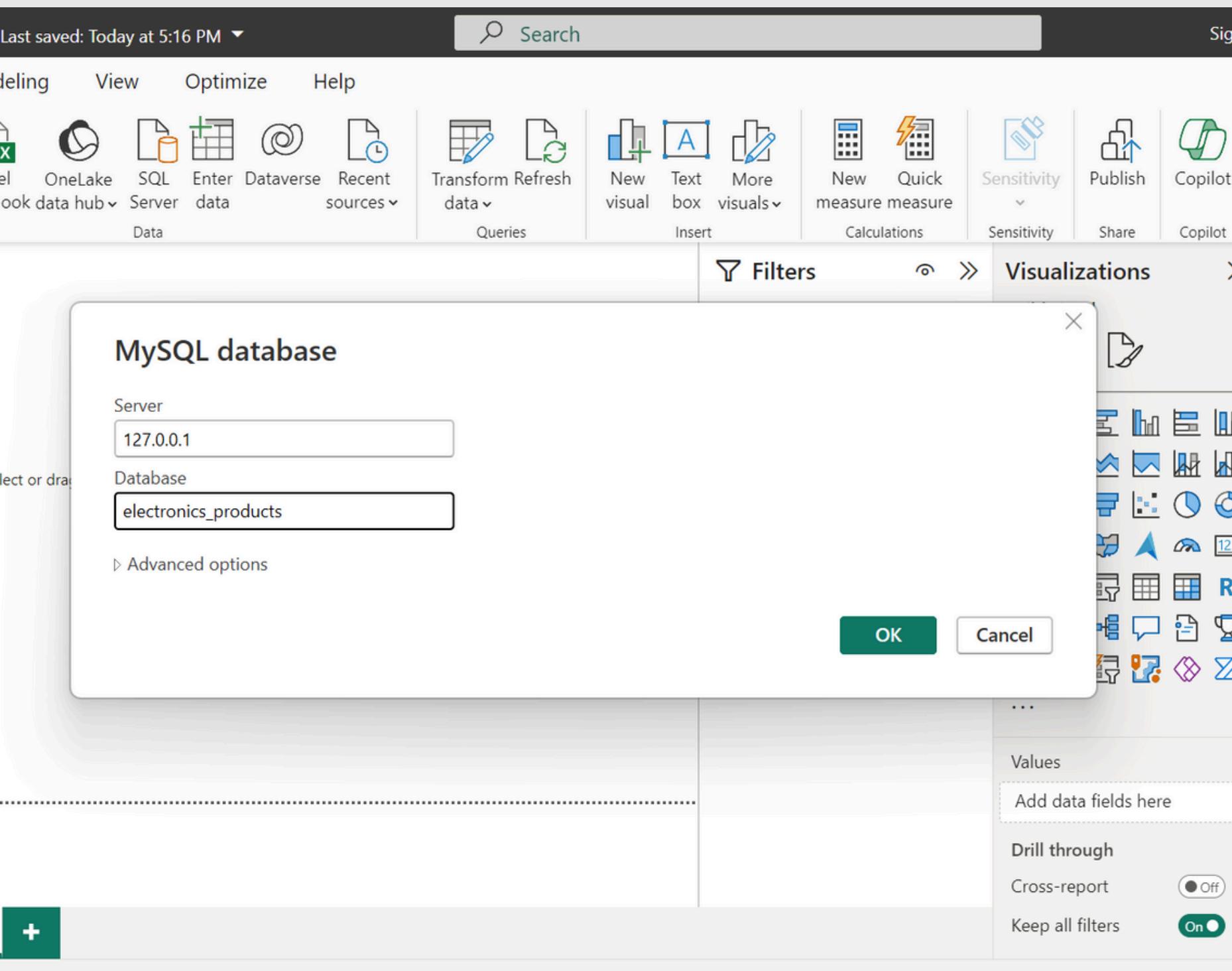
Database linking:

When linking the database, I encountered the issue shown in the image but resolved it by downloading the MySQL Connector/NET.



LINKING DATA SOURCES TO POWER BI

Database linking:



LINKING DATA SOURCES TO POWER BI

Database linking:

Navigator

Display Options ▾

- 127.0.0.1: electronics_products [2]
 -  electronics_products.product_categories
 -  electronics_products.products

electronics_products.products

product_id	product_name	category_id	price	stock_quant
1	USB-C Charging Cable	1	11.95	
2	Bose SoundSport Headphones	2	99.99	
3	Google Phone	3	600	
4	Wired Headphones	2	11.99	
5	Macbook Pro Laptop	4	1700	
6	Lightning Charging Cable	1	14.95	
7	27in 4K Gaming Monitor	5	389.99	
8	AA Batteries (4-pack)	6	3.84	
9	Apple Airpods Headphones	2	150	
10	iPhone	3	700	
11	Flatscreen TV	7	300	
12	20in Monitor	5	109.99	
13	LG Dryer	8	600	
14	ThinkPad Laptop	4	999.99	
15	Vareebadd Phone	3	400	
16	LG Washing Machine	8	600	
17	34in Ultrawide Monitor	5	379.99	
18	27in FHD Monitor	5	149.99	
19	AAA Batteries (4-pack)	6	2.99	

Select Related Tables Load Transform Data Cancel

Navigator

Display Options ▾

- 127.0.0.1: electronics_products [2]
 -  electronics_products.product_categories
 -  electronics_products.products

electronics_products.product_categories

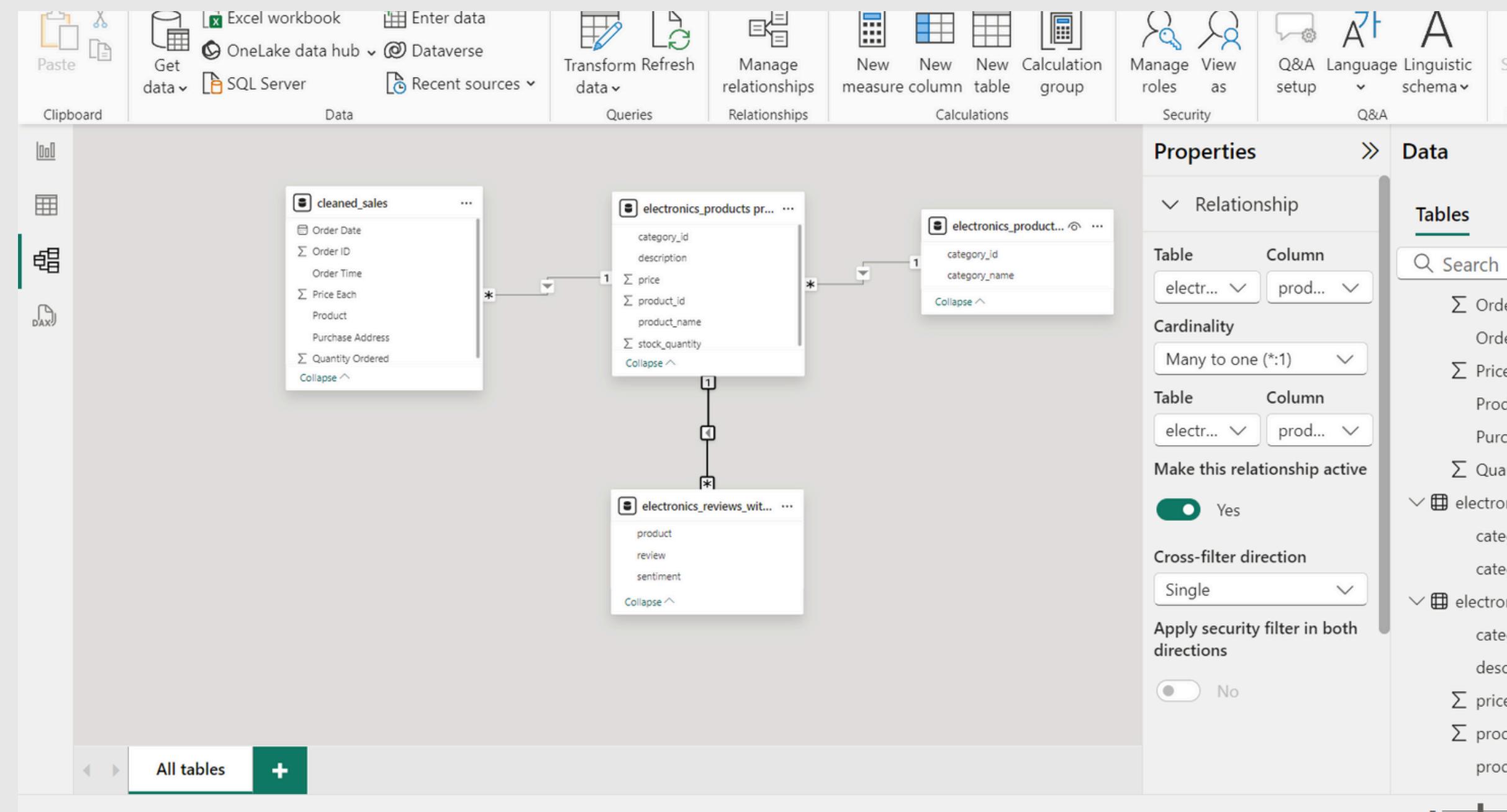
category_id	category_name	electronics_products.products
1	Accessories	Table
2	Headphones	Table
3	Phones	Table
4	Laptops	Table
5	Monitors	Table
6	Batteries	Table
7	Televisions	Table
8	Appliances	Table

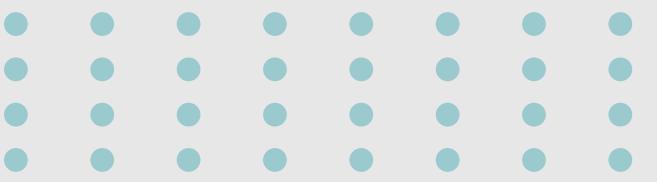
Select Related Tables Load Transform Data Cancel



DATA MODELING

In this phase, I created relationships between all the sources, as shown in the image.

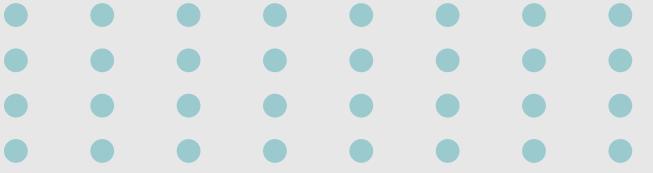




DASHBOARD OBJECTIVE

The objective of the dashboard is to provide a comprehensive overview of the electronics store's sales performance and customer insights. To achieve this, the dashboard is divided into two pages: one for Sales Overview, focusing on key metrics and trends related to sales performance, and another for Customer Insights, analyzing customer feedback and sentiment to enhance understanding of customer satisfaction.





DASHBOARD RESULTS

Welcome page:

Welcome to the Electronics Sales Dashboard

Sales Overview
Dashboard



Customers Insights
Dashboard





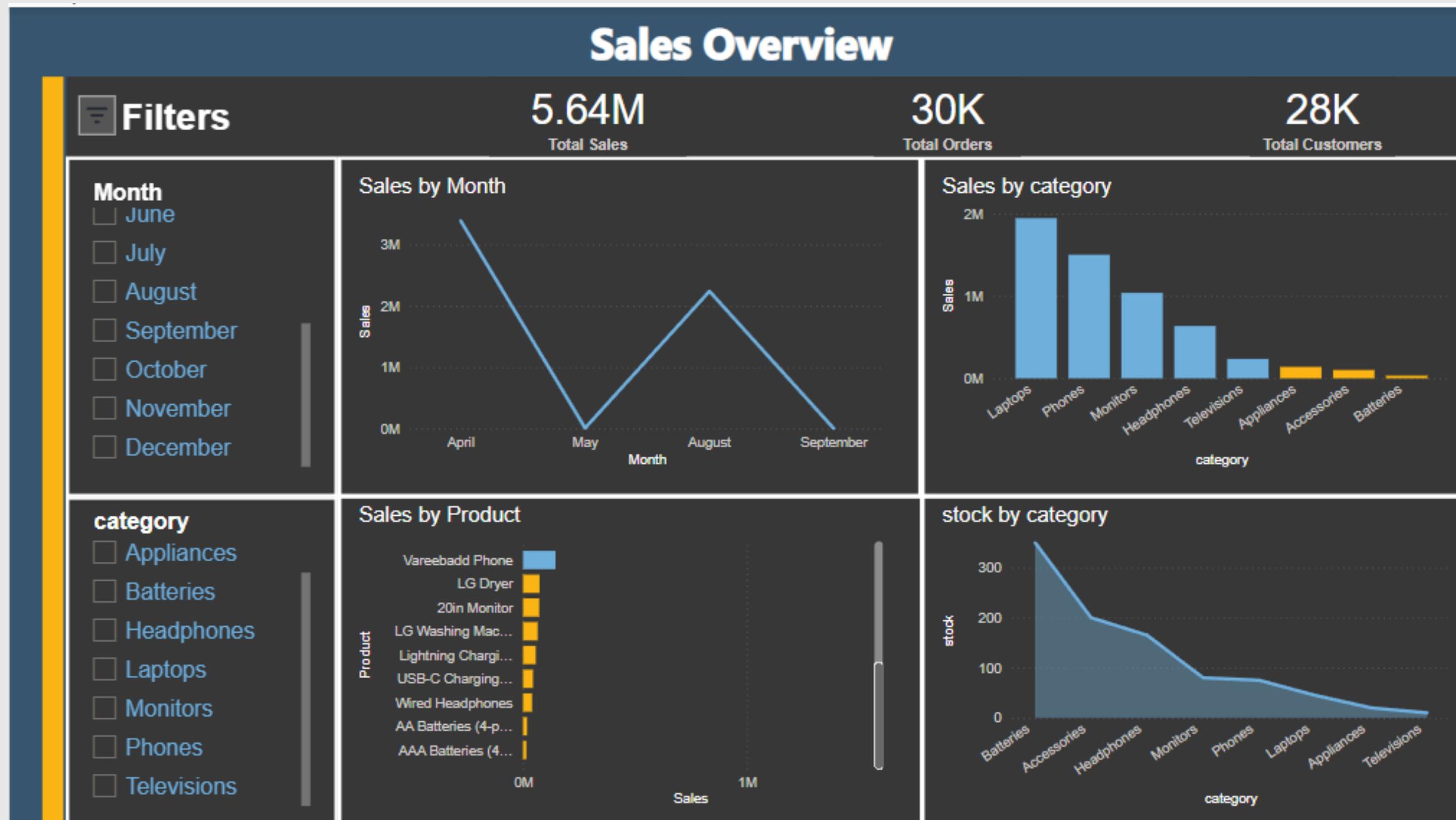
DASHBOARD RESULTS

Sales Overview(First screen):



DASHBOARD RESULTS

Sales Overview(Continued):





DASHBOARD RESULTS

Sales Overview insights and suggestions:

Based on the sales overview, I observed the following insights:

1. The total sales amount to \$5.64 million, with **30,000 orders** placed by **28,000 customers**. The number of orders exceeds the number of customers, indicating that some customers are making multiple purchases.
2. Sales trends show a drop in May and September, with peaks in April and a notable increase in August. This pattern suggests seasonal fluctuations or specific factors affecting sales during these months.
3. The highest sold category is laptops, while batteries, which have the highest stock, are the least sold. The most sold product is the MacBook Pro laptop, whereas the least sold is AAA batteries (4-pack). This discrepancy highlights an opportunity to balance inventory and sales efforts. I recommend promoting the batteries to address the overstock and increasing the laptop inventory to meet the high demand.



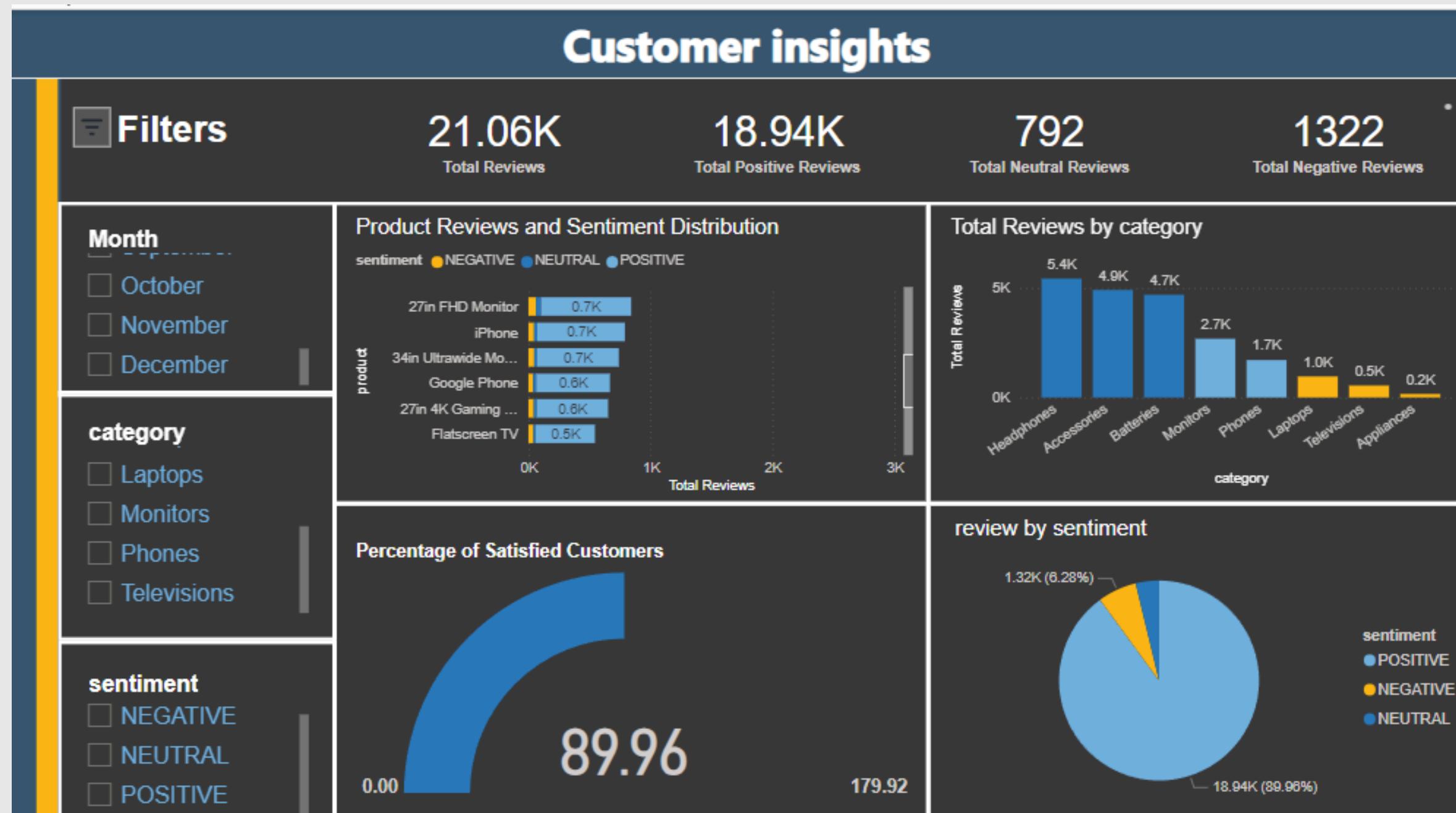
DASHBOARD RESULTS

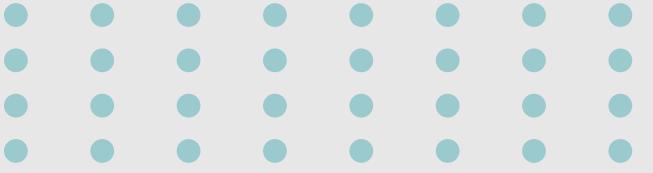
Customers insights (First screen):



DASHBOARD RESULTS

Customers insights (Continued):





DASHBOARD RESULTS

Customers insights' insights and suggestions:

Based on the Customer Insights page, I observed the following:

- 1. Overall Satisfaction:** Out of 21.06K reviews, 18.94K are positive, resulting in a high satisfaction rate of 89.96%. This indicates strong customer approval.
- 2. Product-Specific Sentiment:** The Lightning Charging Cable has the highest positive review count, while the Vareebadd Phone has the lowest. This suggests that improvements may be needed for the Vareebadd Phone to enhance customer satisfaction.
- 3. Review Distribution:** The top three reviewed categories are Headphones, Accessories, and Batteries. To encourage more feedback on devices, consider implementing a reward system on the store's website, such as offering points for reviews, to attract more customer input.

