This query uses the LOAD DATA statement to load the customer_reviews.csv file from Cloud Storage to a BigQuery table with the given column names and data types.

```
LOAD DATA OVERWRITE CustomerReviewGenAI.customer_reviews
(customer_review_id INT64, customer_id INT64, location_id INT64, review_datetime
DATETIME, review_text STRING, social_media_source STRING, social_media_handle STRING)
FROM FILES (
format = 'CSV',
uris = ['gs://coffeeonwheels/customer_reviews.csv']);
```

Create a External connection with vertex ai say named as "gemini conn"

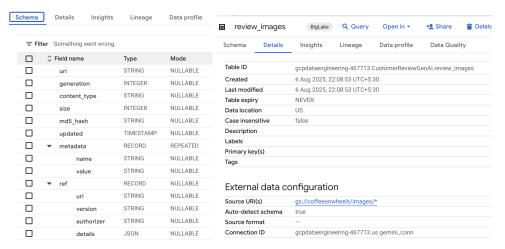
-- Create connection from vertex AI federation bigguery

Connection info

Connection ID	projects/gcpdataengineering-467713/locations/us/connections/gemini_conn
Friendly name	
Created	6 Aug 2025, 22:02:58 UTC+5:30
Last modified	6 Aug 2025, 22:02:58 UTC+5:30
Data location	us
Description	
Connection type	Vertex Al remote models, remote functions and BigLake (Cloud Resource)
Service account ID	bqcx-897867797155-2nup@gcp-sa-bigquery-condel.iam.gserviceaccount.com

The review_images object table is added to the gemini_demo dataset in BigQuery, storing the Cloud Storage URIs for each audio review in the sample dataset. This allows BigQuery to reference and analyze unstructured data like audio files.

```
CREATE OR REPLACE EXTERNAL TABLE
  `CustomerReviewGenAI.review_images`
WITH CONNECTION `us.gemini_conn`
OPTIONS (
  object_metadata = 'SIMPLE',
  uris = ['gs://coffeeonwheels/images/*']
  );
```



-- BigQuery ML statement used to create or update a remote machine learning model i

```
CREATE OR REPLACE MODEL `CustomerReviewGenAI.gemini_2_0_flash`
REMOTE WITH CONNECTION `us.gemini_conn`
OPTIONS (endpoint = 'gemini-2.0-flash')
```

Cloud AI API is not enabled: Vertex AI API has not been used in project gcpdataengineering-467713 before or it is disabled. Enable it by visiting https://console.developers.google.com/apis/api/aiplatform.googleapis.com/overview?project=g cpdataengineering-467713 then retry. If you enabled this API recently, wait a few minutes for the action to propagate to our systems and retry..

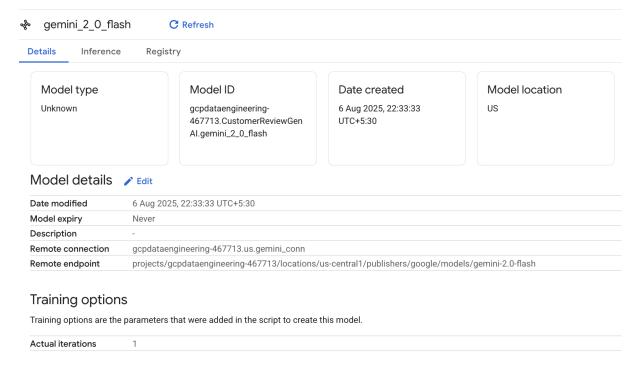
Enable Vertex AI API form api& Services

bqcx-897867797155-2nup@gcp-sa-bigquery-condel.iam.gserviceaccount.com does not have the permission to access or use the endpoint. Please grant the Vertex AI user role to the service account following

https://cloud.google.com/bigquery/docs/generate-text-tutorial#grant-permissions. If issue persists, contact bqml-feedback@google.com for help.

Grant Vertex AI user role to the service account created

Also Grant bucket permission for storage object admin to the external connection service account



Prompt for Keyword Extraction

This query takes customer reviews from the customer_reviews table, constructs prompts for the gemini_2_0_flash model to identify keywords within each review. The results are then stored in a new table customer_reviews_keywords.

```
CREATE OR REPLACE TABLE

`CustomerReviewGenAI.customer_reviews_keywords` AS (

SELECT ml_generate_text_llm_result, social_media_source, review_text, customer_id,
location_id, review_datetime

FROM

ML.GENERATE_TEXT(

MODEL `CustomerReviewGenAI.gemini_2_0_flash`,
(

SELECT social_media_source, customer_id, location_id, review_text, review_datetime,

CONCAT(

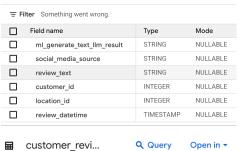
'For each review, provide keywords from the review. Answer in JSON format with one

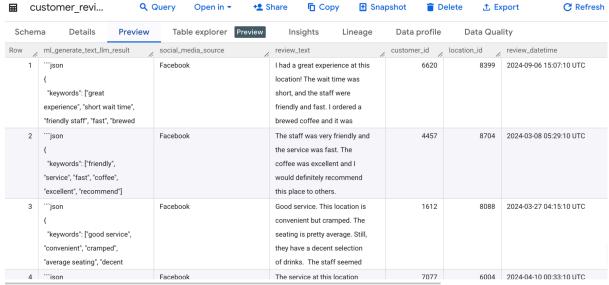
key: keywords. Keywords should be a list.',
    review_text) AS prompt

FROM `CustomerReviewGenAI.customer_reviews`
),

STRUCT(

0.2 AS temperature, TRUE AS flatten_json_output)));
```





- -- Analyze the customer reviews for positive and negative sentiment
- --This query takes customer reviews from the customer_reviews table, constructs prompts for the gemini_2_0_flash model to classify the sentiment of each review. The results are then stored in a new table customer_reviews_analysis, so that you may use it later for further analysis.

```
CREATE OR REPLACE TABLE
`CustomerReviewGenAI.customer_reviews_analysis` AS (
SELECT ml_generate_text_llm_result, social_media_source, review_text, customer_id,
location_id, review_datetime
FROM
ML.GENERATE TEXT(
MODEL `CustomerReviewGenAI.gemini 2 0 flash`,
 SELECT social_media_source, customer_id, location_id, review_text, review_datetime,
     'Classify the sentiment of the following text as positive or negative.',
     review_text, "In your response don't include the sentiment explanation. Remove all
extraneous information from your response, it should be a boolean response either
positive or negative.") AS prompt
 FROM `CustomerReviewGenAI.customer reviews`
),
STRUCT(
 0.2 AS temperature, TRUE AS flatten_json_output)));
```

Schem	na Details	Preview	Table explorer	Preview	Insights	Lineage	Data profile	Data Qua	lity
low /	ml_generate_text_llr	n_result	social_media_source	//	review_text		customer_id/	location_id	review_datetime
1	Negative		Google		The service could be improved. I think it'disorganized. The very friendly and at But we ordered two	s staff was tentive.	995	8206	2024-01-16 20:00:10 UTC
2	Negative		Twitter		The coffee was too my taste and it gav headache.		85	4034	2024-07-25 03:20:10 UTC
3	Negative		Twitter		Noisy Location'		877	3347	2024-05-01 14:39:10 UTC
4	negative		Google		I had a very disapp experience at this of The service was te staff were rude and inattentive, and we	offee truck.	3998	8844	2024-02-12 09:03:10 UTC
5	negative		Twitter		The baristas were i	•	1224	9745	2024-09-09 20:26:10 UTC

	Table				able info			
∓F	ilter Something went wrong.			Table ID	gcpdataengineering-467713.CustomerReviewGenAl.customer_reviews_analysi			
	Field name	Туре	Mode	Created	6 Aug 2025, 23:46:24 UTC+5:30			
	rieid flaffie			Last modified	6 Aug 2025, 23:46:24 UTC+5:30			
	ml generate text llm result	STRING	NULLABLE	Table expiry	NEVER			
				 Data location 	US			
	social_media_source	STRING	NULLABLE	Default collation				
	review_text	STRING	NULLABLE	Default rounding mode	ROUNDING_MODE_UNSPECIFIED			
	customer id	INTEGER	NULLABLE	Case insensitive	false			
				Description				
	location_id	INTEGER	NULLABLE	Labels				
		TIMESTAMP	NULLABLE	Primary key(s)				
	review_datetime	THVILSTAIVIE		Tags				

- --Create a view to sanitize the records
- --The query creates the view, cleaned_data_view and includes the sentiment results

```
CREATE OR REPLACE VIEW CustomerReviewGenAI.cleaned_data_view AS

SELECT

REPLACE(REPLACE(REPLACE(LOWER(ml_generate_text_llm_result), '.', ''), '', ''), '\n',

'') AS sentiment,

REGEXP_REPLACE(REGEXP_REPLACE(REGEXP_REPLACE(social_media_source,
    r'Google(\+|\sReviews|\sLocal|\sMy\sBusiness|\sreviews|\sMaps)?',
        'Google'), 'YELP', 'Yelp'), r'SocialMedia1?', 'Social Media') AS

social_media_source,

review_text,

customer_id,
location_id,
review_datetime

FROM

CustomerReviewGenAI.customer_reviews_analysis;
```

∓ Fi	ilter Something went wrong.				
	Field name	Туре	Mode	View info	
	sentiment	STRING	NULLABLE	View ID	gcpdataengineering-467713.CustomerReviewGenAl.cleaned_data_view
	social media source	STRING	NULLABLE	Created	6 Aug 2025, 23:52:49 UTC+5:30
				Last modified	6 Aug 2025, 23:52:49 UTC+5:30
	review_text	STRING	NULLABLE	View expiry	NEVER
	customer id	INTEGER	NULLABLE	Use Legacy SQL	false
	0001011101_10			Description	
	location_id	INTEGER	NULLABLE	Labels	
_				Primary key(s)	
	review_datetime	TIMESTAMP	NULLABLE	Tags	



--Create a report of positive and negative review counts

```
SELECT sentiment, COUNT(*) AS count
FROM `CustomerReviewGenAI.cleaned_data_view`
WHERE sentiment IN ('positive', 'negative')
GROUP BY sentiment;
 Job information
                      Results
                                   Chart
                                              JSON
                                                         Execution details
                                                                               Execution graph
Row
        sentiment -
                                     count -
    1
        negative
                                                   9
        positive
                                                  41
```

-- Create a count of positive and negative reviews by social media source

```
SELECT sentiment, social_media_source, COUNT(*) AS count
FROM `CustomerReviewGenAI.cleaned_data_view`
WHERE sentiment IN ('positive') OR sentiment IN ('negative')
GROUP BY sentiment, social_media_source
ORDER BY sentiment, count;
  Job information
                       Results
                                    Chart
                                                JSON
                                                           Execution details
                                                                                  Execution graph
         sentiment -
                                      social_media_source ▼
Row
                                                                    count -
                                                                                  1
     1
         negative
                                      Yelp
     2
         negative
                                      Google
                                                                                  2
         negative
                                      Twitter
                                                                                  6
     3
         positive
                                      Tiktok
                                                                                  1
```

Generating Market Suggestions

- -- Respond to customer reviews
- -- Note: Refer to zero-shot vs. few-shot prompts within the Google AI for Developers documentation for more information.

-- This table will contain the original review data along with the generated marketing suggestions, allowing you to easily analyze and act upon them.

```
CREATE OR REPLACE TABLE
`CustomerReviewGenAI.customer_reviews_marketing` AS (
SELECT ml_generate_text_llm_result, social_media_source, review_text, customer_id,
location_id, review_datetime
FROM
ML.GENERATE TEXT(
MODEL `CustomerReviewGenAI.gemini_2_0_flash`,
 SELECT social_media_source, customer_id, location_id, review_text, review_datetime,
CONCAT (
     'You are a marketing representative. How could we incentivise this customer with
this positive review? Provide a single response, and should be simple and concise, do
not include emojis. Answer in JSON format with one key: marketing. Marketing should be a
string.', review_text) AS prompt
 FROM `CustomerReviewGenAI.customer reviews`
),
STRUCT(
 0.2 AS temperature, TRUE AS flatten_json_output)));
```



For Specific customer -> Apply where clause

```
CREATE OR REPLACE TABLE
`gemini_demo.customer_reviews_marketing` AS (
SELECT ml_generate_text_llm_result, social_media_source, review_text, customer_id,
location_id, review_datetime
ML.GENERATE_TEXT(
MODEL `gemini_demo.gemini_2_0_flash`,
   SELECT social_media_source, customer_id, location_id, review_text, review_datetime,
CONCAT (
      'You are a marketing representative. How could we incentivise this customer with
this positive review? Provide a single response, and should be simple and concise, do
not include emojis. Answer in JSON format with one key: marketing. Marketing should be a
string.', review_text) AS prompt
   FROM `gemini demo.customer reviews`
   WHERE customer_id = 5576
),
STRUCT(
```

```
0.2 AS temperature, TRUE AS flatten_json_output)));
SELECT * FROM `gemini_demo.customer_reviews_marketing`
```

For Better Readability :-

Use:-

```
CREATE OR REPLACE TABLE
`CustomerReviewGenAI.customer_reviews_marketing_formatted` AS (
SELECT
    review_text,
    JSON_QUERY(RTRIM(LTRIM(results.ml_generate_text_llm_result, " ```json"), "```"),
"$.marketing") AS marketing,
    social_media_source, customer_id, location_id, review_datetime
FROM
    `CustomerReviewGenAI.customer_reviews_marketing` results )

select * from `CustomerReviewGenAI.customer_reviews_marketing_formatted`;
```

Job in	formation Results	Chart JSON Execut	ion details Execution gra	ph		
Row /	review_text ▼	marketing ▼	, social_media_source ▼	, customer_id ▼	location_id ▼	review_datetime ▼
1	The service at this location was great. The staff was friendly and helpful, and they made sure my coffee was made just the way I liked it.	"Offer a free drink or small discount on their next purchase as a thank you for their positive feedback and continued patronage."	Facebook	3079	4433	2024-06-26 10:23:10 (
2	The service was great and the coffee was even better. I especially liked the variety of milk alternatives.	"Thank you for your kind words! We'd love to offer you a free coffee on your next visit to show our appreciation."	Facebook	4478	4364	2024-03-10 23:41:10
3	I enjoyed my fresh brewed coffee. The barista was very friendly. I will make this a	"Thank you for your kind words! We'd love to offer you a free coffee on your next visit.	Facebook	1339	5634	2024-06-07 07:48:10 し

Github link for the sources : -