

# Automatic Review Reply Generation Using OpenAI on AWS SageMaker



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# 1. Introduction

This project automates the process of generating professional replies to customer reviews on Yelp using OpenAI's GPT-3.5-Turbo model. It leverages AWS SageMaker for scalable execution and Amazon S3 for input/output data storage. Businesses across various categories benefit from this system by receiving tailored, polite responses to customer feedback.

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## 2. Objective

- Automatically reply to customer reviews for businesses in categories like restaurants, bars, coffee & tea, gyms, etc.
  - Customize responses based on the business category.
  - Ensure all processing happens via a secure and scalable cloud infrastructure (AWS).
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## 3. Tools & Technologies

- **AWS SageMaker** for running Python scripts
  - **Amazon S3** for storing input and output review files
  - **OpenAI GPT-3.5 Turbo** for generating responses
  - **Pandas** for CSV operations
  - **Boto3** for interacting with AWS services
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## 4. Folder & File Setup

- **S3 Bucket:** `kiran-yelp-project-bucket`
- **Folder Structure:**

- Input Reviews: `category_files/*.csv`
  - Output GPT Replies: `category_files/gpt_*.csv`
  - **Categories Covered:**
    - american (traditional)
    - bars
    - coffee & tea
    - Food
    - gyms
    - nightlife
    - restaurants
    - sandwiches
- 

## 5. Setting Up on AWS SageMaker

### Step 1: Open SageMaker Studio

1. Log in to your AWS Management Console.
2. Go to **SageMaker** > **SageMaker Studio**.
3. Open a new Jupyter Notebook.

### Step 2: Install Required Packages

`!pip install openai boto3 pandas`

### Step 3: Set Up Configuration

`import boto3`

```

import pandas as pd
import openai
from io import StringIO
import urllib.parse
import os

api_key = "<your-openai-api-key>"
bucket_name = "kiran-yelp-project-bucket"
s3_folder = "category_files/"

```

## Step 4: Review Category Files

```

csv_files = [
    "american (traditional).csv", "bars.csv", "coffee & tea.csv", "Food.csv",
    "gyms.csv", "nightlife.csv", "restaurants.csv", "sandwiches.csv"
]

```

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# 6. GPT Reply Generation Logic

## Step 1: Define GPT Reply Function

```

def generate_reply(review_text, category):
    client = openai.OpenAI(api_key=api_key)
    prompt = f"""
You're the owner of a business in the {category} category. Write a professional and polite
response to this customer review:
\n"{review_text}"
Response:
"""
    response = client.chat.completions.create(
        model="gpt-3.5-turbo",
        messages=[{"role": "user", "content": prompt}],
        temperature=0.7
    )
    return response.choices[0].message.content

```

## Step 2: Process CSV Files and Generate Responses

```

s3 = boto3.client("s3")

for file_name in csv_files:

```

```

category = os.path.splitext(file_name)[0]
input_key = f"{s3_folder}{file_name}"
output_key = f"{s3_folder}gpt_{file_name}"

response = s3.get_object(Bucket=bucket_name, Key=input_key)
df = pd.read_csv(response["Body"])

df["gpt_response"] = df["review_text"].apply(lambda x: generate_reply(x, category))

csv_buffer = StringIO()
df.to_csv(csv_buffer, index=False)
s3.put_object(Bucket=bucket_name, Key=output_key, Body=csv_buffer.getvalue())

```

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## 7. Sample Output Format (gpt\_restaurants.csv)

business_id	review_text	gpt_response
abc123	"The pizza was dry and burnt."	"Thank you for your feedback..."

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## 8. Results

Each category file is processed and saved back to S3 with **gpt\_** prefix. The files include the original review and a professional GPT-generated response.

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## 9. Example Outputs:

-  [/mnt/data/gpt\\_restaurants.csv](#)

G2																										Thank you for taking the time to share your feedback with us. We're glad to hear that you enjoyed our turnip greens, pulled pork, and baked beans. We appreciate your honest review and will take your comments about the beef brisket and chicken into consideration to continue improving our menu. We hope to have the opportunity to serve you again in the future and provide you with a 5-star experience across the board. Thank you for choosing our restaurant.																									
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V																													
1	review_id	business_id	business_name	stars	review_text	category	gpt_response																																												
2	mHPwVwWh	PnnW5n30	Hog Heaven		3	Good food	h	restaurants	Thank you for taking the time to share your feedback with us. We're glad to hear that you enjoyed our turnip greens, pulled pork, and baked beans. We appreciate your honest review and will take your comments abo																																										
3	NuX7DeTh2	PnnW5n30	Hog Heaven		3	I'm not		restaurants	Thank you																																										
4	uU3ZqmNv	PnnW5n30	Hog Heaven		3	Still some of		restaurants	Thank you for taking the time to provide us with your feedback. We are thrilled to hear that you still consider our BBQ to be some of the best in Nashville. We apologize that your last visit was not up to our usual stan																																										
5	hH8C8_E5J	PnnW5n30	Hog Heaven		3	Long a		restaurants	Dear valued																																										
6	xurU6pO2vJ	PnnW5n30	Hog Heaven		3	No trip to		restaurants	Thank you																																										
7	NyLisNfLCvI	PnnW5n30	Hog Heaven		3	I ordered Ub		restaurants	Thank you for taking the time to provide feedback on your recent experience with our restaurant. We truly appreciate hearing from our customers as it helps us continuously improve our offerings. We apologize that t																																										
8	48JO9J3OgR	PnnW5n30	Hog Heaven		3	I will start		restaurants	Thank you																																										
9	lGJl6KCTKm	PnnW5n30	Hog Heaven		3	Overrated.		Restaurants	Thank you																																										
10	6uq83NlU5	PnnW5n30	Hog Heaven		3	We stopped		restaurants	Thank you for taking the time to share your feedback with us. We appreciate your detailed review and are glad to hear that you enjoyed our ribs. We apologize that our BBQ sauces and sides did not meet your expect																																										
11	tesu38ou2K	PnnW5n30	Hog Heaven		3	Being from		restaurants	Thank you																																										
12	p8MYZEjd0	PnnW5n30	Hog Heaven		3	Tried the		restaurants	Dear valued																																										
13	T3pmP6RU2	PnnW5n30	Hog Heaven		3	Pork sandwich		restaurants	Thank you for taking the time to provide feedback on your recent visit. We're glad to hear that you enjoyed the flavor of the pork sandwich, but we're sorry to hear that you felt the portion size did not meet your exper																																										
14	CX5K6CtR2	PnnW5n30	Hog Heaven		3	We were ex		restaurants	Dear																																										
15	y576r-bi5mI	PnnW5n30	Hog Heaven		3	Quick and g		restaurants	Thank you so much for taking the time to leave us such a positive review! We are thrilled to hear that you enjoyed our quick and delicious smoked food, especially the turkey and white sauce, pulled pork on cornbread																																										
16	3d1B3fu8B	PnnW5n30	Hog Heaven		3	Went out w		restaurants	Thank you for taking the time to provide feedback on your recent visit to our restaurant. We apologize that the portion size did not meet your expectations and that you found the price to be high. We strive to provide																																										
17	3FwR5SFr	PnnW5n30	Hog Heaven		3	I came here		restaurants	Thank you																																										
18	Tz2CA3yCAC	PnnW5n30	Hog Heaven		3	A nice little		I restaurants	Thank you for taking the time to leave us a review! We're glad to hear that you enjoyed our BBQ and found it to be tasty and a great value. We appreciate your feedback on the spice level, as we strive to cater to a va																																										
19	BlUp4p7HC4	PnnW5n30	Hog Heaven		3	Hog Heaven		restaurants	Thank you for taking the time to leave us a review! We are thrilled to hear that you enjoyed our delicious meats, yummy white sauce, and simple menu offerings. We take pride in offering quality food at affordable p																																										
20	4Q_Cq0b	PnnW5n30	Hog Heaven		3	Hog Heaven		restaurants	Thank you																																										
21	F7BUJT8ooCf	PnnW5n30	Hog Heaven		3	I've been w		restaurants	Thank you for taking the time to share your feedback with us. We're sorry to hear that your experience at Hog Heaven did not meet your expectations. We truly appreciate your honest review and will take your comm																																										
22	CKC4y6pOD	Qh-vuX2kE\	Texas Roadh		4	Texas Roadh		restaurants	Thank you for taking the time to share your feedback with us. We are glad to hear that you enjoyed the quality of our ribeye steak, but we apologize for the delay in your to-go order. We are constantly working to imp																																										
23	Ap_rA2u-Zf	Qh-vuX2kE\	Texas Roadh		4	Gf and I we		restaurants	Thank you for taking the time to share your feedback with us. We are glad to hear that you had an overall enjoyable experience during your visit to Texas Roadhouse. We appreciate your kind words about our quick se																																										
24	h42yK7ouP	Qh-vuX2kE\	Texas Roadh		4	I visited TRH		restaurants	Thank you so much for taking the time to leave us your feedback! We are thrilled to hear that you had the best experience at TRH on 1/24/19. We are delighted that our food met your expectations and that your wait																																										
25	B5Su06Hw	Qh-vuX2kE\	Texas Roadh		4	This is a neg		restaurants	Thank you so much for taking the time to leave such a detailed and positive review! We are thrilled to hear that you enjoy dining at our location and that our customer service, food quality, and atmosphere have met																																										
26	B3i5r4w1fL	Qh-vuX2kE\	Texas Roadh		4	Texas		restaurants	Thank you so much for taking the time to write such a positive review of Texas Roadhouse! We are thrilled to hear that you enjoy our fresh meats, delicious sides, and irresistible bread basket. It's great to hear that o																																										
27	4Q4Qhu_Au	Qh-vuX2kE\	Texas Roadh		4	Very nice		restaurants	Thank you																																										
28	ol_TwR_eJg	Qh-vuX2kE\	Texas Roadh		4	I came here		restaurants	Thank you																																										
29	vaWfKfb2o2	Qh-vuX2kE\	Texas Roadh		4	Standard		restaurants	Thank you for taking the time to leave your feedback. We are glad to hear that you enjoyed the quality of our steaks and rolls during your visit. We apologize for the crowded parking lot, and we will do our best to add																																										
30	7F78k7b0uL	Qh-vuX2kE\	Texas Roadh		4	This is my fa		restaurants	Thank you for your feedback and for being a loyal customer of our steakhouse. We are sorry to hear that you have noticed a change in the taste of our rolls. We take all customer feedback seriously and will address th																																										

•  /mnt/data/gpt\_Sandwiches.csv

G3																										Thank you for taking the time to leave us a review. We're glad to hear that you enjoyed the delicious food and that your sandwiches were great overall. We sincerely apologize for the oversight in forgetting the Arby's sauce you requested. We will address this issue with our team to ensure it doesn't happen again in the future. We appreciate your feedback and hope to have the opportunity to serve you again soon. Thank you for choosing our business.																									
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V																													
1	review_id	business_id	business_name	stars	review_text	category	gpt_response																																												
2	meaV7DVO2	LJ3oefRPFzw	Arby's		3	Sandwiches		Sandwiches	Dear valued																																										
3	hABOTfNW1	LJ3oefRPFzw	Arby's		3	Service coulc		Sandwiches	Thank you for taking the time to leave us a review. We're glad to hear that you enjoyed the delicious food and that your sandwiches were great overall. We sincerely apologize for the oversight in forgetting the Arby's																																										
4	LTFb7VlmqL	LJ3oefRPFzw	Arby's		3	I rarely rate		Sandwiches	Thank you for taking the time to share your experience with our new BBQ Smokehouse Brisket sandwich at Arby's. We are thrilled to hear that you enjoyed the combination of smoked brisket, Gouda cheese, onion str																																										
5	AZyxfHWwC	AX90mZMBY	Penn Station		3	This is my fir		Sandwiches	Thank you																																										
6	lJoaN6tW-f	AX90mZMBY	Penn Station		3	If you are		Sandwiches	Thank you for taking the time to leave us feedback. We appreciate your input and will definitely take your comments into consideration. We strive to provide delicious sandwiches that meet the expectations of all of i																																										
7	gc7UjHkPFI	AX90mZMBY	Penn Station		3	Fairly tasty.		Sandwiches	Thank you for taking the time to share your feedback with us. We strive to provide a unique and delicious dining experience for all of our customers. While we are not a chain, we appreciate your honesty and will take																																										
8	Ow6L6ZD56	AX90mZMBY	Penn Station		3	The was acc		Sandwiches	Thank you for taking the time to leave us a review! We are thrilled to hear that you enjoyed your meal and that our fries and sandwiches met your expectations. We take pride in offering a variety of size options to ca																																										
9	xu0H_vYpR	AX90mZMBY	Penn Station		3	My friend an		Sandwiches	Thank you for taking the time to provide feedback on your recent visit to our establishment. We appreciate your patronage and are glad to hear that you enjoyed the taste of our sub sandwiches. We take customer fei																																										
10	PFNNJJAoGS	AX90mZMBY	Penn Station		3	I'm not sure		Sandwiches	Dear valued																																										
11	vLRULeADY1	JGicSeCBF_t	Shanks Origi		3	I am a very f		Sandwiches	Thank you for taking the time to share your feedback with us. We value your opinion and are sorry to hear that you feel our sandwiches have not lived up to your expectations. We take customer feedback seriously an																																										
12	dWC8BRF-V	JGicSeCBF_t	Shanks Origi		3	Food: 3		Sandwiches	Thank you for taking the time to leave us a detailed review. We're glad to hear that you enjoyed our steak sandwich and found the meat well-prepared. We appreciate your feedback regarding our Cajun fries and the																																										
13	HGUQCB556	JGicSeCBF_t	Shanks Origi		3	Ok ok...the		Sandwiches	Thank you																																										
14	72N_Pmewr	FN2V0keC2c	Hungry Howl		3	Hungry howl		Sandwiches	Thank you for taking the time to leave us a review. We're glad to hear that you enjoyed your experience and that our team was able to prepare your order quickly and to your satisfaction. We take pride in providing fr																																										
15	ZnLfzq2wHEHf	FN2V0keC2c	Hungry Howl		3	Hungry Howl		Sandwiches	Dear valued																																										
16	ZnLfzq2wHEHf	FN2V0keC2c	Hungry Howl		3	This is a very		Sandwiches	Thank you for taking the time to leave a review! We pride ourselves on offering hot grilled subs and fresh cut fries made to order for our customers. We appreciate your kind words and hope to see you again soon at i																																										
17	Q3XhVpW	VBvz0AfoNI	Brother Z's V		3	I'm not sure		Sandwiches	Thank you																																										
18	NUJTCXQ6	VBvz0AfoNI	Brother Z's V		3	I drop from		Sandwiches	Thank you for taking the time to visit our establishment and share your feedback. We appreciate your input and are always striving to improve our offerings. We apologize that the wings did not meet your expectation																																										
19	FPwgl64vz2C	VBvz0AfoNI	Brother Z's V		3	Order was la		Sandwiches	Dear valued																																										
20	WGLER8RZ2v	VBvz0AfoNI	Brother Z's V		3	5* for the		Sandwiches	Dear valued																																										
21	LZ1RQ4hFrVB	VBvz0AfoNI	Brother Z's V		3	I got a 6 piec		Sandwiches	Thank you																																										
22	GBXDMX70C	XLIHr_6duc9	The Grocery		1	While		Sandwiches	Dear																																										
23	YK47BD_3v7	XLIHr_6duc9	The Grocery		1	Never ate...		Sandwiches	Dear valued																																										
24	WJAZ2N6W	XLIHr_6duc9	The Grocery		1	Ugh! I wante		Sandwiches	Dear valued																																										
25	8K6Z4yHvC	XLIHr_6duc9	The Grocery		1	Sign in wind		Sandwiches	Dear valued																																										
26	UIOWVtIma	Hvb_g72c39	Jimmy John's		1	I don't know		Sandwiches	Dear valued																																										
27	QQ_VjWjWl	Hvb_g72c39	Jimmy John's		1	Awful servic		Sandwiches	Dear valued																																										
28	cwsmwq451	Hvb_g72c39	Jimmy John's		1	I have be		Sandwiches	Thank you for taking the time to share your feedback with us. We apologize for the experience you had at our location. We strive to provide excellent service and accurate orders to all of our customers, and we are di																																										
29	UwCmAcxd3	Hvb_g72c39	Jimmy John's		1	Awful. Brea		Sandwiches	Dear valued																																										

610	Dear valued customer,																									
Thank you for taking the time to share your detailed feedback on your experience at Optimal. We truly appreciate your kind words about Marissa at the front desk, the cleanliness of our facilities, and the positive impact																										
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V				
1	review_id	business_id	business_name	stars	review_text	category	gpt_response																			
2	5mk4kqKvCv	lRgVmRphM	Downtown B	4	I love to rock	gyms	Thank you for your positive feedback! We are thrilled to hear that you enjoy our free climbing wall and that you take advantage of our open climb night on Tuesdays. We strive to provide a welcoming and enjoyable ex																			
3	hDOZ_lyeW	lRgVmRphM	Downtown B	4	This place is	gyms	Thank you for taking the time to review our gym. We are glad to hear that you found our facility clean and well-equipped, and that you enjoyed our pool. We understand that pricing can be a concern for some custom																			
4	Q-8nOT_ZYk	lRgVmRphM	Downtown B	4	Went to the	gyms	Thank you for taking the time to leave us such a positive review! We are thrilled to hear that you enjoyed your experience at our facility and found our staff to be friendly and our equipment up to date. We look f																			
5	qE6Lz2ZB2	lRgVmRphM	Downtown B	4	Great worko	gyms	Thank you for taking the time to share your feedback with us. We're glad to hear that you enjoy our workout facility and find our staff to be helpful and nice. We apologize for any inconvenience regarding our Sunday																			
6	OzW9TgH9Y	y6vGp5mUG	AC4 Fitness	4	Good and cle	gyms	Thank you for taking the time to share your feedback with us! We're glad to hear that you enjoy our gym for arm day and cardio workouts, as well as appreciate our clean facilities and tanning services. We value your																			
7	WfvcY2Nt94	y6vGp5mUG	AC4 Fitness	4	I love	gyms	Thank you																			
8	xAF15zxpYOi	y6vGp5mUG	AC4 Fitness	4	I recently	gyms	Thank you for taking the time to share your experience at our gym! We are thrilled to hear that you are enjoying the convenience of our location, 24-hour access, and the amenities we offer such as key fob entry, priv																			
9	f546CZvKhk	y6vGp5mUG	AC4 Fitness	4	AC4 is a	gyms	Thank you																			
10	W5H7uR6u	Vpb127k_Pe	Optimal Spo	4	When I j	gym	Dear valued																			
11	o7pf5CDZ5i	Vpb127k_Pe	Optimal Spo	4	Overall, this	gym	Thank you for taking the time to leave us a review! We're glad to hear that you're enjoying your experience at our gym and find our membership costs affordable. We appreciate your feedback regarding the equipme																			
12	XEwYK5fMb	Vpb127k_Pe	Optimal Spo	4	At first the	gym	Thank you																			
13	L-X8nykzkgb	Vpb127k_Pe	Optimal Spo	4	Clean,	gym	Thank you for your detailed and honest review of our gym. We are glad to hear that you appreciate our clean facilities, newer equipment, and friendly staff. We understand your feedback regarding our free weights a																			
14	jar1suukmJh	Vpb127k_Pe	Optimal Spo	4	After my fori	gym	Thank you so much for taking the time to share your experience at Optimal Sport Health Club. We are thrilled to hear that you found our amenities and classes to your liking. We appreciate your feedback regarding th																			
15	3K6GYxPwll	Vpb127k_Pe	Optimal Spo	4	Edit	gym	Thank you for taking the time to share your feedback with us. We are glad to hear that Jeff was able to assist you promptly with your membership cancellation and refund. We strive to provide excellent customer ser																			
16	uCF1s-5_9Hr	Vpb127k_Pe	Optimal Spo	4	I joined	gym	Thank you so much for taking the time to share your experience at Optimal! We are thrilled to hear that you have found our gym to exceed your expectations and that our knowledgeable trainers have been able to he																			
17	ZkM2OY95U	Vpb127k_Pe	Optimal Spo	4	After 12th	gym	Thank you																			
18	XU016L_YM	KFZxYh-HK3	Sweat Reno	5	I've been a	gym	Thank you																			
19	K5YnsAn4-B	KFZxYh-HK3	Sweat Reno	5	The Cryother	gym	Thank you so much for taking the time to share your feedback with us! We are thrilled to hear that you had such a positive experience with our Cryotherapy services and that Jamie provided you with excellent guidanc																			
20	ru_IHGqVnI	KFZxYh-HK3	Sweat Reno	5	Great experi	gym	Thank you for your kind words! We are thrilled to hear that you had a great experience at our gym and that you found it unique compared to other options in Reno. We strive to provide our customers with top-notch fi																			
21	d2W5QdQg	KFZxYh-HK3	Sweat Reno	5	This place is	gym	Thank you so much for your kind words and positive feedback! We are thrilled to hear that you are enjoying our facilities and amenities, such as our saunas and cryotherapy services. We strive to create a welcoming a																			
22	Oe_zu5FV6E	KFZxYh-HK3	Sweat Reno	5	Jamie is the	gym	Thank you so much for your kind words about Jamie and our business! We are thrilled to hear that you had a positive experience and appreciate your recommendation. Our team is dedicated to providing excellent ser																			
23	z4nlt3A8Ph	KFZxYh-HK3	Sweat Reno	5	This place is	gym	Thank you so much for your kind words and for taking the time to share your experience at Sweat Reno. We are thrilled to hear that you have found our facility to be your new workout and wellness obsession. Our tea																			
24	PK_B2D_gyU	qjg6b4DLKf	Anytime Fitr	5	Anytime fitn	gym	Thank you for your kind words and for choosing Anytime Fitness as your preferred gym! We are thrilled to hear that you always find the equipment you need for a great workout, no matter what time of day you visit.																			
25	F0aEMlYosj	qjg6b4DLKf	Anytime Fitr	5	Four things I	gym	Thank you for taking the time to share your positive experience at our gym. We are delighted to hear that we have met your expectations with our facilities, including our three squat racks, bumper plates, spin bike, a																			
26	KG5YQd5Ew	qjg6b4DLKf	Anytime Fitr	5	I love	gym	Thank you so much for your kind words and positive feedback! We're thrilled to hear that you love our gym and had a great experience with our personal trainers, Emily and Dane. Providing a clean and safe environm																			
27	wi23z_hv7H	KFZxYh-HK3	Sweat Reno	5	Being	gym	Thank you for taking the time to share your experience with us! We are thrilled to hear that you have found a welcoming and engaging environment at our gym. Our team strives to make every member feel valued a																			
28	Jen3YUQqj	KFZxYh-HK3	Sweat Reno	5	The staff are	gym	Thank you for taking the time to leave such a positive review! We strive to create a welcoming environment for all of our customers here in downtown Belleville. We're glad to hear that you enjoyed your visit to our f																			
29	ICL4253ZtHj	KFZxYh-HK3	Sweat Reno	5	I enjoy the d	gym	Thank you for taking the time to share your positive experience at Belleville YMCA. We are delighted to hear that you enjoy the facilities and staff at our gym. Providing a welcoming environment for families and indi																			
30	h8uLr_Q8hM	u6d7P8m10f	AC4 Fitness	4	Cuch a great	gym	Thank you so much for taking the time to share your positive experience at our gym! We are thrilled to hear that you find our facility clean, our staff helpful, and our hours convenient. We strive to provide a warm																			

📍 /mnt/data/gpt\_nightlife.csv

66	Thank you for taking the time to share your feedback with us. We are thrilled to hear that you enjoyed our food offerings and found the ambiance to your liking. We apologize for the service experience you had during your visits. Your feedback is invaluable to us as we strive to provide exceptional service to all our guests. We will address your concerns with our team to ensure that we improve in this area. We hope you will give us another opportunity to exceed your expectations in the future. Thank you for choosing our establishment for your dining experiences.																									
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V				
1	review_id	business_id	business_name	stars	review_text	category	gpt_response																			
2	SRl8W4SOI	SAGVYa1_X	Heritage	4	...what?	Nightlife	Dear																			
3	8lBuFRk3c	SAGVYa1_X	Heritage	4	Went with	Nightlife	Thank you																			
4	pr_QoLaZg	SAGVYa1_X	Heritage	4	They're exte	Nightlife	Thank you so much for taking the time to leave such a positive review! We're thrilled to hear that you enjoyed our extensive bar selection and delicious food offerings. We take pride in our architecture and design, as																			
5	mtF5LExcE	SAGVYa1_X	Heritage	4	What a fun	Nightlife	Thank you																			
6	ZCqyIT-ce0i	SAGVYa1_X	Heritage	4	I went the	Nightlife	Thank you for taking the time to share your feedback with us. We are thrilled to hear that you enjoyed our food offerings and found the ambiance to your liking. We apologize for the service experience you had during your visits. Your feedback is invaluable to us as we strive to provide exceptional service to all our guests. We will address your concerns with our team to ensure that we improve in this area. We hope you will give us another opportunity to exceed your expectations in the future. Thank you for choosing our establishment for your dining experiences.																			
7	UopXm4Ywi	SAGVYa1_X	Heritage	4	Great food,	Nightlife	Thank you for taking the time to share your feedback with us. We are thrilled to hear that you enjoyed our food offerings and found the ambiance to your liking. We apologize for the service experience you had during your visits. Your feedback is invaluable to us as we strive to provide exceptional service to all our guests. We will address your concerns with our team to ensure that we improve in this area. We hope you will give us another opportunity to exceed your expectations in the future. Thank you for choosing our establishment for your dining experiences.																			
8	W-qQYtZtE	SAGVYa1_X	Heritage	4	Came in last	Nightlife	Thank you for taking the time to leave us a review! We're glad to hear that you enjoyed the live music and our drink menu during your recent visit. We hope you had a great time and look forward to hearing your thought																			
9	D0uq2p8XN	SAGVYa1_X	Heritage	4	Came here t	Nightlife	Thank you for taking the time to leave us a review! We're glad to hear that you enjoyed the live music and our drink menu during your recent visit. We hope you had a great time and look forward to hearing your thought																			
10	FrMTtluuX8	SAGVYa1_X	Heritage	4	Great restau	Nightlife	Thank you for your kind words and recommendation. We are thrilled to hear that you enjoyed our ambiance and food offerings. We appreciate your feedback on the service and will work on ensuring a more friendly e																			
11	fpWxpB4-Hy	SAGVYa1_X	Heritage	4	I have been t	Nightlife	Thank you for taking the time to share your experience with us! We are thrilled to hear that you have enjoyed our live jazz band and food during your visits to Heritage. We strive to provide our customers with a mem																			
12	PfEduK3V1	SAGVYa1_X	Heritage	4	Tremendous	Nightlife	Thank you so much for taking the time to leave us such a positive review! We're thrilled to hear that you enjoyed our unique menu offerings and the atmosphere of our establishment. Our staff works hard to provide																			
13	QvBC3W68f	SAGVYa1_X	Heritage	4	Great space	Nightlife	Thank you																			
14	glf0cmABDi	SAGVYa1_X	Heritage	4	One of my f	Nightlife	Thank you																			
15	UGf5m1NtY	SAGVYa1_X	Heritage	4	Very happy a	Nightlife	Thank you so much for your kind words and for taking the time to share your experience at Heritage! We're thrilled to hear that you enjoyed the music, ambiance, and food during your visit. We greatly appreciate yo																			
16	WuLmWQv	SAGVYa1_X	Heritage	4	Went to	Nightlife	Thank you																			
17	ZMj9m4r7VZ	SAGVYa1_X	Heritage	4	Environmen	Nightlife	Thank you																			
18	zh9hp3h9g	WfWmJ0gDc	Doc Magro	5	Went in last	Nightlife	Thank you so much for taking the time to share your experience at our establishment! We are thrilled to hear that you had a fantastic first visit and enjoyed everything from the food to the service. It's great to hear t																			
19	bl13VMe5jd	WfWmJ0gDc	Doc Magro	5	My FAVORIT	Nightlife	Thank you so much for taking the time to share your experience at our restaurant! We are thrilled to hear that you enjoyed the \$1 oysters and our wide variety of seafood options. We apologize for any confusion rega																			
20	SSa0p0QmJ	WfWmJ0gDc	Doc Magro	5	We just went	Nightlife	Thank you so much for your glowing review of Doc Magro's! We are thrilled to hear that you had such a wonderful dining experience with us. We take pride in providing exceptional food and service to all of our cu																			
21	TASgNf6Rv	WfWmJ0gDc	Doc Magro	5	The best fish	Nightlife	Thank you for taking the time to leave us a review! We're thrilled to hear that you enjoyed our fish n chips and that that reminded you of Borough Market in London. We strive to offer high-quality dishes at a fair pri																			
22	TKCD0kA6v	WfWmJ0gDc	Doc Magro	5	Great	Nightlife	Thank you so much for taking the time to leave us such a wonderful review! We are thrilled to hear that you enjoyed the food and atmosphere during your visit, and we are especially pleased to hear that you had a gr																			
23	WuLmWQv	WfWmJ0gDc	Doc Magro	5	That's the first	Nightlife	Thank you so much for taking the time to share your wonderful experience at Doc's! We are thrilled to hear that you and your husband enjoyed your Valentine's Day Brunch with us. It's great to know that our v																			
24	UjpmVAbmF	WfWmJ0gDc	Doc Magro	5	Awsome, fr	Nightlife	Thank you so much for your kind words and glowing review! We are thrilled to hear that you enjoyed our friendly service, delicious food, and amazing desert shooters. We truly appreciate your support and would c																			
25	JXKZ5E2	AmFwM0gDc	Doc Magro	5	Had a great i	Nightlife	Thank you for taking the time to leave us such a wonderful review! We are thrilled to hear that you had a great time on our second floor, enjoyed the food, and had excellent service from Kelsey. We are so glad we w																			
26	g7QKvGk0d	WfWmJ0gDc	Doc Magro	5	Went with m	Nightlife	Dear																			
27	xMNXAHZGz	WfWmJ0gDc	Doc Magro	5	What can i	Nightlife	Dear valued																			
28	HqgMxvFMv	CD7rWYXN	39 North Ta	5	Well it was i	Nightlife	Thank you so much for taking the time to leave us such a wonderful review! We are thrilled to hear that you had a fantastic dining experience with us, from the excellent food to the top-notch service provided by Annie.																			
29	Really great	CD7rWYXN	39 North Ta	5	Really great	Nightlife	Thank you so much for taking the time to leave us such a positive review! We're thrilled to hear that you enjoyed our food, friendly service, and live music. It's our goal to create a welcoming and enjoyable atmosphere f																			
30	1H8RZGZG	CD7rWYXN	39 North Ta	5	Thank you so much for your kind words and positive feedback. We are thrilled to hear that you enjoyed our friendly service and live music. We will continue to strive for excellence in creating a great dining exper																					

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## 11. Limitations & Improvements

- **Cost:** OpenAI usage can get expensive with thousands of reviews.
- **Speed:** Processing 1000s of rows takes significant time.
- **Improvement:** Can parallelize using SageMaker Processing jobs.

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## 12. Conclusion

This pipeline showcases an effective way to automate customer engagement via LLMs, using AWS infrastructure. It can be scaled to multiple cities, categories, and integrated directly with customer support systems.

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## 13. Appendix

- [✓] OpenAI API usage logs
- [✓] SageMaker screenshot
- [✓] GPT Output CSVs (provided separately)

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## 14. Acknowledgments

- Built and tested in AWS SageMaker
- Uses OpenAI GPT-3.5-turbo
- CSV data based on filtered Yelp reviews