

# 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

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## 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`)

<code>business_id</code>	<code>review_text</code>	<code>gpt_response</code>
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`

Review ID		Business ID	Business Name	Stars	Review Text	Category	GPT Response																
		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	mHPwvRWh	PrnWk6rs30	Hog Heaven	3	Good food.	N 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 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.																
3	NroXtDeh2	PrnWk6rs30	Hog Heaven	3	I'm not	restaurants	Thank you																
4	uuJ2gmNrc	PrnWk6rs30	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	hB8C8L_65jT	PrnWk6rs30	Hog Heaven	3	Long a	restaurants	Dear valued																
6	xurJ6pO2vt	PrnWk6rs30	Hog Heaven	3	No trip to	restaurants	Thank you																
7	NyUsLMLVt	PrnWk6rs30	Hog Heaven	3	I ordered Urb	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	48/09j3QgR	PrnWk6rs30	Hog Heaven	3	I will stay	restaurants	Thank you																
9	9gileCTkm	PrnWk6rs30	Hog Heaven	3	Overrated.	restaurants	Thank you																
10	6sgd3o3L5	PrnWk6rs30	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	tex3u8CuZK	PrnWk6rs30	Hog Heaven	3	Being from	restaurants	Thank you																
12	p8MVYZEjd0	PrnWk6rs30	Hog Heaven	3	I tried the	restaurants	Dear valued																
13	13pmP8u8l2	PrnWk6rs30	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 exp																
14	Cv5k6Clzr2	PrnWk6rs30	Hog Heaven	3	We were ex	restaurants	Dear																
15	y57r6-b5n	PrnWk6rs30	Hog Heaven	3	Quick and go	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	d3tB3uBtRC	PrnWk6rs30	Hog Heaven	3	Want out wi	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	3f+WB8uFr	PrnWk6rs30	Hog Heaven	3	I came here	restaurants	Thank you																
18	Tz2CA5YAC	PrnWk6rs30	Hog Heaven	3	A nice little f	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	bupq-H7c4	PrnWk6rs30	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	Q_4cbu-K1	PrnWk6rs30	Hog Heaven	3	Hog Heaven	restaurants	Thank you																
21	F7JU180uBc	PrnWk6rs30	Hog Heaven	3	I've been wa	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	CCK4x9pG0D	Qh-xvQ2F6El	Texas Roadh	4	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_z-A2nd-Zh	Qh-xvQ2F6El	Texas Roadh	4	G and I wen	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																
24	Hi7x2yQm	Qh-xvQ2F6El	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 1/24/18. We are delighted that our food met your expectations and that your wait																
25	B55uD4tbHw	Qh-xvQ2F6El	Texas Roadh	4	This is a reg	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 were met																
26	B2544Rw1fL	Qh-xvQ2F6El	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 c																
27	G4OpUj_AUc	Qh-xvQ2F6El	Texas Roadh	4	Very nice	restaurants	Thank you																
28	ol_TwH_dE	Qh-xvQ2F6El	Texas Roadh	4	I came here	restaurants	Thank you																
29	wavKF2zDc	Qh-xvQ2F6El	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	7j-9h673u	Qh-xvQ2F6El	Texas Roadh	4	This is my fa	restaurants	Thank you for your feedback and for being a loyal customer of our establishment. We are sorry to hear that you have noticed a change in the taste of our meat. We take all customer feedback seriously and will address th																

-  /mnt/data/gpt\_Sandwiches.csv

- /mnt/data/gpt\_gyms.csv

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
G10 Dear valued customer,																					
1	review_id	business_id	business_name	stars	review_text	category	gpt_response														
2	xZmk4pxKvI	IrGVnRpHAI	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 environment for all our members.															
3	hD0Z_tyEWI	IrGVnRpHAI	Downtown B	4	This place is gym	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 customers, but we offer competitive rates and value for money.															
4	Q_8n0T_ZKjI	IrGVnRpHAI	Downtown B	4	Went to the gym	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 forward to seeing you again soon!															
5	qEbLcZzB2I	IrGVnRpHAI	Downtown B	4	Great worko gym	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 hours, but we strive to provide a great experience for all our members.															
6	OwV7tGHOY	y6GPs5UG	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 feedback and strive to provide a great experience for all our members.															
7	WfV2YNI4	y6GPs5UG	AC4 Fitness	4	I love gyms	Thank you!															
8	xAf1SzgyOvI	y6GPs5UG	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, private lockers, and a spacious membership area.															
9	f546ZVKhk	y6GPs5UG	AC4 Fitness	4	Ack Is a gyms	Thank you!															
10	ViHS87ukQd	Vpb127K_Pe_Optimal_Spo	4	When I jone a gym	Dear valued customer,																
11	o7ptf5CD7tVpb127K_Pe_Optimal_Spo	4	Overall, this gyms	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 equipment and facilities we offer.																	
12	XEWkSMiMb	Vpb127K_Pe_Optimal_Spo	4	At first the gyms	Thank you!																
13	L-X8nykzbgb	Vpb127K_Pe_Optimal_Spo	4	Clean, gyms	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 area and strive to provide a great experience for all our members.																
14	jar3tukmP	Vpb127K_Pe_Optimal_Spo	4	After my forgyms	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 the facilities and staff we offer.																
15	k3kgkYpWl	Vpb127K_Pe_Optimal_Spo	4	Edit gyms	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 service and support for all our members.																
16	ucdF5-S	Vpb127K_Pe_Optimal_Spo	4	I joined gyms	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 help you reach your fitness goals.																
17	ZMzdXy95Vu	Vpb127K_Pe_Optimal_Spo	4	After 12th gyms	Thank you!																
18	SUOJ1M	Vpb127K_Pe_Optimal_Spo	5	I've been a gyms	Thank you!																
19	ks3tLm4h	Vpb127K_Pe_Optimal_Spo	5	The Crotcher gyms	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 guidance.																
20	l4tGrtuV1	Vpb127K_Pe_Optimal_Spo	5	Great exps gyms	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 facilities and services.																
21	dRwN5Qdop	Vpb127K_Pe_Optimal_Spo	5	This place is gyms	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 sauna and cryotherapy services. We strive to create a welcoming atmosphere for all our members.																
22	o2Jsf1Vc	Vpb127K_Pe_Optimal_Spo	5	James is the gyms	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 service and support for all our members.																
23	1dln4Chabhw	Vpb127K_Pe_Optimal_Spo	5	This place is gyms	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 team is dedicated to providing exceptional service and support for all our members.																
24	9N_B20-exW	Vpb127K_Pe_Optimal_Spo	5	Anytime fitn	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	FOx3LMiyos	Vpb127K_Pe_Optimal_Spo	5	Four things I gyms	We are delighted to hear that we have met your expectations with our facilities, including our three squat racks, bumper plates, and more. We strive to provide a clean and safe environment for all our members.																
26	wCg5jQjgS	Vpb127K_Pe_Optimal_Spo	5	I love gyms	Thank you so much for your kind words and positive feedback! We are 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 environment is our top priority.																
27	wiZ3w_hT7	IrGVnRpHAI	Downtown B	5	Being gyms	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 and appreciated.															
28	jen3YUQq	IrGVnRpHAI	Downtown B	5	The staff an gyms	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 facility.															
29	ICL42537ZhI	IrGVnRpHAI	Downtown B	5	I enjoy the gyms	We are delighted to hear that you enjoy the facilities and staff at our gym. Providing a welcoming environment for families and individuals is our top priority.															
30	h0u..._Gudh...uRm...Rm...1C	IrGVnRpHAI	Downtown B	5	C such a great gyms	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 facilities clean, our staff dedicated, and our hours convenient. We strive to provide a welcoming environment for all our members.															

• /mnt/data/gpt\_nightlife.csv

A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V
G6 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 visit. 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.																					
1	review_id	business_id	business_name	stars	review_text	category	gpt_response														
2	.9R19X45i0	5AGWya1_X_Heritage	4	4...what?	Nightlife	Dear															
3	8lBuR1k2	5AGWya1_X_Heritage	4	Went with	Nightlife	Thank you!															
4	_Lr_Qolap	5AGWya1_X_Heritage	4	They're extre	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 well as our commitment to quality ingredients.															
5	mTf5LexEc	5AGWya1_X_Heritage	4	What a fu	Nightlife	Thank you!															
6	ZCqyIT-eoII	5AGWya1_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 visit. 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	Upoxm4Yw1	5AGWya1_X_Heritage	4	Great food,	Nightlife	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, and more. We strive to provide a clean and safe environment for all our members.															
8	W_qoQYj2zE	5AGWya1_X_Heritage	4	Came in last	Nightlife	Thank you for taking the time to share your experience with us! We are 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 environment is our top priority.															
9	DtqCp6K6V	5AGWya1_X_Heritage	4	Came here ti	Nightlife	Thank you for taking the time to leave us such a positive 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 thoughts on our service and food offerings. We appreciate your feedback on the service and will work on ensuring a more friendly atmosphere for all our guests.															
10	FrmTfluu7	5AGWya1_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 atmosphere for all our guests.															
11	fpKwpb4-hy	5AGWya1_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 memorable experience.															
12	PfEduk3V1	5AGWya1_X_Heritage	4	Tremendous	Nightlife	Thank you so much for taking the time to leave us such a positive review! We're glad to hear that you enjoyed our unique menu offerings and the atmosphere of our establishment. Our staff works hard to provide a welcoming environment for all our guests.															
13	QaBC3W8e81	5AGWya1_X_Heritage	4	Great spa	Nightlife	Thank you!															
14	gFOc0BDi	5AGWya1_X_Heritage	4	One of my fa	Nightlife	Thank you!															
15	UPG5Ln4mNTV	5AGWya1_X_Heritage	4	Very happy t	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 visits. We greatly appreciate your feedback on the service and will work on ensuring a more friendly atmosphere for all our guests.															
16	ReJmhu01	5AGWya1_X_Heritage	4	Entertaining	Nightlife	Thank you!															
17	ZPf9w4t7V2	5AGWya1_X_Heritage	4	Entertainin	Nightlife	Thank you!															
18	qhdh4b6m	5AGWya1_X_Heritage	5	Want 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 that you are a regular customer!															
19	UJW_M5d9f	5AGWya1_X_Heritage	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 90+ seats and our wide variety of seafood options. We apologize for any confusion regarding the menu.															
20	Sa4k1m6qf	5AGWya1_X_Heritage	5	Went with	Nightlife	Thank you so much for your glowing review of Doc Magrino'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 guests.															
21	AsgnF61qf	5AGWya1_X_Heritage	5	The best fish	Nightlife	Thank you for taking the time to leave us such a wonderful review! We are thrilled to hear that you enjoyed our fish n chips and that they reminded you of Borough Market in London. We strive to offer high-quality dishes at a fair price.															
22	TCCD0KXe	5AGWya1_X_Heritage	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 great time with your friends.															
23	CuhAnJQW	5AGWya1_X_Heritage	5	Our first visit	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 Valentines Day brunch with us. It's great to know that our oysters, caviar, and steaks are a hit with our guests.															
24	UpJbnVABmf	5AGWya1_X_Heritage	5	Awesome,	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 dessert shooters. We truly appreciate your support and would be honored to have you back again.															
25	jX7SE2	5AGWya1_X_Heritage	5	Had a great t	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 had you as a guest!															
26	g7OKw4tCkf	5AGWya1_X_Heritage	5	Went with n	Nightlife	Dear															
27	whXAHgZ7	5AGWya1_X_Heritage	5	What can I s	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 that you are a regular customer!															
28	HqMgMgzxFM	5AGWya1_X_Heritage	5	Well it was i	Nightlife	Thank you so much for taking the time to leave 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	ZMBwbxD21	5AGWya1_X_Heritage	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 for all our guests.															
30	iI3i077Ma	5AGWya1_X_Heritage	5	This place is	Nightlife	Thank you so much for your kind words and positive feedback! We are thrilled to hear that you enjoyed your divine experience with us. Our team of professional chefs takes great pride in creating delicious dishes for all our guests.															

(Provide screenshots of top 5 responses from each category.)

## 10. Observations

- GPT responses were contextually relevant and category-aware.
- The **temperature** value of 0.7 allowed slight creativity while maintaining professionalism.
- Each file had between 500–2000 reviews depending on category.

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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