

```
pip install kagglehub
```

```
Requirement already satisfied: kagglehub in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (0.3.4)
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Requirement already satisfied: packaging in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from kagglehub) (24.1)
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```
Requirement already satisfied: requests in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from kagglehub) (2.32.3)
```

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Requirement already satisfied: tqdm in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from kagglehub) (4.66.6)
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Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from requests->kagglehub) (3.4.0)
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Requirement already satisfied: idna<4,>=2.5 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from requests->kagglehub) (3.10)
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Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from requests->kagglehub) (2.2.3)
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Requirement already satisfied: certifi>=2017.4.17 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from requests->kagglehub) (2024.8.30)
```

```
Requirement already satisfied: colorama in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from tqdm->kagglehub) (0.4.6)
```

```
Note: you may need to restart the kernel to use updated packages.
```

```
[notice] A new release of pip is available: 24.0 -> 24.3.1
```

```
[notice] To update, run: C:\Users\himaj\AppData\Local\Microsoft\WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\python.exe -m pip install --upgrade pip
```

```
import os
import zipfile
import pandas as pd
```

```

# Install Kaggle API if not installed
!pip install kaggle

# Set Kaggle API key path if needed
os.environ['KAGGLE_CONFIG_DIR'] = "/path/to/your/.kaggle/" # Set only
if 'kaggle.json' isn't in the default location

# Download the Trip Advisor Hotel Reviews dataset
!kaggle datasets download -d andrewmvd/trip-advisor-hotel-reviews

# Unzip the downloaded file
with zipfile.ZipFile('trip-advisor-hotel-reviews.zip', 'r') as
zip_ref:
    zip_ref.extractall('trip_advisor_reviews')

# Load the dataset into a DataFrame
df = pd.read_csv('trip_advisor_reviews/tripadvisor_hotel_reviews.csv')

# Display the first few rows of the DataFrame
df.head()

```

```

Requirement already satisfied: kaggle in c:\users\himaj\appdata\local\
packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (1.6.17)
Requirement already satisfied: six>=1.10 in c:\users\himaj\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from kaggle)
(1.16.0)
Requirement already satisfied: certifi>=2023.7.22 in c:\users\himaj\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from kaggle) (2024.8.30)
Requirement already satisfied: python-dateutil in c:\users\himaj\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from kaggle) (2.9.0.post0)
Requirement already satisfied: requests in c:\users\himaj\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from kaggle)
(2.32.3)
Requirement already satisfied: tqdm in c:\users\himaj\appdata\local\
packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from kaggle)
(4.66.6)
Requirement already satisfied: python-slugify in c:\users\himaj\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from kaggle) (8.0.4)
Requirement already satisfied: urllib3 in c:\users\himaj\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\

```

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localcache\local-packages\python311\site-packages (from kaggle)
(2.2.3)
Requirement already satisfied: bleach in c:\users\himaj\appdata\local\
packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from kaggle)
(6.2.0)
Requirement already satisfied: webencodings in c:\users\himaj\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from bleach-
>kaggle) (0.5.1)
Requirement already satisfied: text-unidecode>=1.3 in c:\users\himaj\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from python-slugify->kaggle) (1.3)
Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\
himaj\appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from requests->kaggle) (3.4.0)
Requirement already satisfied: idna<4,>=2.5 in c:\users\himaj\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from requests-
>kaggle) (3.10)
Requirement already satisfied: colorama in c:\users\himaj\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from tqdm->kaggle)
(0.4.6)

```

```

[notice] A new release of pip is available: 24.0 -> 24.3.1
[notice] To update, run: C:\Users\himaj\AppData\Local\Microsoft\
WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\
python.exe -m pip install --upgrade pip

```

```

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19%|██        | 1.00M/5.14M [00:01<00:05, 757kB/s]
39%|██████    | 2.00M/5.14M [00:01<00:02, 1.52MB/s]
58%|█████████ | 3.00M/5.14M [00:01<00:00, 2.44MB/s]
78%|██████████| 4.00M/5.14M [00:01<00:00, 3.49MB/s]
100%|██████████| 5.14M/5.14M [00:01<00:00, 2.86MB/s]

```

```

Dataset URL: https://www.kaggle.com/datasets/andrewmvd/trip-advisor-
hotel-reviews
License(s): Attribution-NonCommercial 4.0 International (CC BY-NC 4.0)
Downloading trip-advisor-hotel-reviews.zip to d:\Gradius_project

```

	Review	Rating
0	nice hotel expensive parking got good deal sta...	4
1	ok nothing special charge diamond member hilt...	2
2	nice rooms not 4* experience hotel monaco seat...	3

```
3 unique, great stay, wonderful time hotel monac... 5
4 great stay great stay, went seahawk game aweso... 5
```

```
df=df[~df['Rating'].isin([3,4,5])]
```

```
df
```

	Review	Rating
1	ok nothing special charge diamond member hilt...	2
10	poor value stayed monaco seattle july, nice ho...	2
15	horrible customer service hotel stay february ...	1
16	disappointed say anticipating stay hotel monac...	2
24	great location need internally upgrade advanta...	2
...
20484	deceptive staff deceptive desk staff claiming ...	2
20485	not impressed unfriendly staff checked asked h...	2
20488	ok just looks nice modern outside, desk staff ...	2
20489	hotel theft ruined vacation hotel opened sept ...	1
20490	people talking, ca n't believe excellent ratin...	2

```
[3214 rows x 2 columns]
```

```
!pip install selenium
!pip install webdriver_manager
!pip install beautifulsoup4
```

```
Requirement already satisfied: selenium in c:\users\himaj\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (4.26.1)
```

```
Requirement already satisfied: urllib3<3,>=1.26 in c:\users\himaj\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from urllib3[socks]<3,>=1.26-
>selenium) (2.2.3)
```

```
Requirement already satisfied: trio~=0.17 in c:\users\himaj\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from selenium)
(0.27.0)
```

```
Requirement already satisfied: trio-websocket~=0.9 in c:\users\himaj\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from selenium) (0.11.1)
```

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Requirement already satisfied: certifi>=2021.10.8 in c:\users\himaj\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from selenium) (2024.8.30)
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Requirement already satisfied: typing_extensions~=4.9 in c:\users\
himaj\appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from selenium) (4.12.2)
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Requirement already satisfied: websocket-client~=1.8 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from selenium) (1.8.0)
Requirement already satisfied: attrs>=23.2.0 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from trio~=0.17->selenium) (24.2.0)
Requirement already satisfied: sortedcontainers in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from trio~=0.17->selenium) (2.4.0)
Requirement already satisfied: idna in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from trio~=0.17->selenium) (3.10)
Requirement already satisfied: outcome in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from trio~=0.17->selenium) (1.3.0.post0)
Requirement already satisfied: sniffio>=1.3.0 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from trio~=0.17->selenium) (1.3.1)
Requirement already satisfied: cffi>=1.14 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from trio~=0.17->selenium) (1.17.1)
Requirement already satisfied: wsproto>=0.14 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from trio-websocket~=0.9->selenium) (1.2.0)
Requirement already satisfied: pysocks!=1.5.7,<2.0,>=1.5.6 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from urllib3[socks]<3,>=1.26->selenium) (1.7.1)
Requirement already satisfied: pycparser in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from cffi>=1.14->trio~=0.17->selenium) (2.22)
Requirement already satisfied: h11<1,>=0.9.0 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from wsproto>=0.14->trio-websocket~=0.9->selenium) (0.14.0)

[notice] A new release of pip is available: 24.0 -> 24.3.1

```
[notice] To update, run: C:\Users\himaj\AppData\Local\Microsoft\WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\python.exe -m pip install --upgrade pip
```

```
Requirement already satisfied: webdriver_manager in c:\users\himaj\AppData\Local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (4.0.2)
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Requirement already satisfied: requests in c:\users\himaj\AppData\Local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from webdriver_manager) (2.32.3)
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Requirement already satisfied: python-dotenv in c:\users\himaj\AppData\Local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from webdriver_manager) (1.0.1)
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Requirement already satisfied: packaging in c:\users\himaj\AppData\Local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from webdriver_manager) (24.1)
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Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\himaj\AppData\Local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from requests->webdriver_manager) (3.4.0)
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Requirement already satisfied: idna<4,>=2.5 in c:\users\himaj\AppData\Local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from requests->webdriver_manager) (3.10)
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Requirement already satisfied: urllib3<3,>=1.21.1 in c:\users\himaj\AppData\Local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from requests->webdriver_manager) (2.2.3)
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Requirement already satisfied: certifi>=2017.4.17 in c:\users\himaj\AppData\Local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from requests->webdriver_manager) (2024.8.30)
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```
Requirement already satisfied: beautifulsoup4 in c:\users\himaj\AppData\Local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (4.12.3)
```

```
Requirement already satisfied: soupsieve>1.2 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from beautifulsoup4) (2.6)
```

```
[notice] A new release of pip is available: 24.0 -> 24.3.1  
[notice] To update, run: C:\Users\himaj\AppData\Local\Microsoft\WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\python.exe -m pip install --upgrade pip
```

```
from selenium import webdriver  
from selenium.webdriver.common.by import By  
from selenium.webdriver.chrome.service import Service as ChromeService  
from webdriver_manager.chrome import ChromeDriverManager  
from selenium.webdriver.support.ui import WebDriverWait  
from selenium.webdriver.support import expected_conditions as EC  
from bs4 import BeautifulSoup  
import time  
import csv # Import csv module
```

```
# Set up ChromeDriver
```

```
service = ChromeService(ChromeDriverManager().install())  
driver = webdriver.Chrome(service=service)
```

```
# Open the target URL
```

```
url = 'https://www.consumeraffairs.com/travel/marriott.html'  
driver.get(url)
```

```
# Counter for review numbers
```

```
review_counter = 1
```

```
# Create a CSV file to save the review data
```

```
with open('marriott_reviews.csv', mode='w', newline='', encoding='utf-8') as csv_file:
```

```
    fieldnames = ['Review No', 'Customer Name', 'Date', 'Rating',  
'Review', 'Services Rated', 'Verified Purchase'] # Add new fields  
    writer = csv.DictWriter(csv_file, fieldnames=fieldnames)
```

```
# Write the header row
```

```
writer.writeheader()
```

```
# Function to scrape reviews from a page
```

```
def scrape_reviews():  
    global review_counter
```

```
    # Wait for reviews to load
```

```
    WebDriverWait(driver, 10).until(  
        EC.presence_of_all_elements_located((By.CLASS_NAME,  
'rvw__cntr'))
```

```

    )

    more_buttons = driver.find_elements(By.CLASS_NAME, 'js-
expander-container')
    for button in more_buttons:
        try:
            button.click()
            time.sleep(1)
        except:
            pass

    # Parse the page source with BeautifulSoup
    soup = BeautifulSoup(driver.page_source, 'html.parser')
    reviews = soup.find_all('div', class_='rvw_cntr')

    # Extract and write the review data to the CSV
    for review in reviews:

        customer_name_tag = review.find('span', class_='rvw__inf-
nm')
        customer_name = customer_name_tag.text.strip() if
customer_name_tag else "Anonymous"

        date = review.find('p', class_='rvw__rvd-dt')
        review_date = date.text.strip() if date else "No date"

        stars_div = review.find('div', class_='rvw__rtg')
        star_rating = "No rating"
        if stars_div:
            star_classes = stars_div.get('class', [])
            for cls in star_classes:
                if 'stars-sprt--p-' in cls:
                    star_rating = cls.split('--p-')[-1] + " stars"

        review_text = review.find('div', class_='rvw__top-text')
        review_content = review_text.text.strip() if review_text
else "No review content"
        # Remove 'More' if it appears at the end
        if review_content.endswith('More'):
            review_content = review_content[:-4].strip()

        services Rated = []
        service_tags = review.find_all('span', class_='rvw__tag')
        for tag in service_tags:
            services Rated.append(tag.text.strip())
        services Rated_str = ', '.join(services Rated) if
services Rated else "No services rated"

```



```

        verified_purchase = review.find('span', class_='rvw__inf-
ver')
        verified = 'Yes' if verified_purchase and 'Verified
purchase' in verified_purchase.text.strip() else 'No'

        # Print the extracted data
        print(f"Review No {review_counter}:")
        print(f"Customer: {customer_name}")
        print(f>Date: {review_date}")
        print(f"Rating: {star_rating}")
        print(f"Review: {review_content}")
        print(f"Services Rated: {services_rated_str}")
        print(f"Verified Purchase: {verified}")
        print("-" * 80)

        # Write the review data to the CSV file
        writer.writerow({
            'Review No': review_counter,
            'Customer Name': customer_name,
            'Date': review_date,
            'Rating': star_rating,
            'Review': review_content,
            'Services Rated': services_rated_str,
            'Verified Purchase': verified
        })

        # Increment the review counter
        review_counter += 1

    # Loop through pages
    for page_num in range(1, 6):
        if page_num > 1:
            try:
                # Locate the pagination link for the next page
                next_page_link = driver.find_element(By.LINK_TEXT,
str(page_num))

                driver.execute_script("arguments[0].scrollIntoView(true);",
next_page_link)
                time.sleep(1)
                driver.execute_script("arguments[0].click();",
next_page_link)
                time.sleep(2)
            except Exception as e:
                print(f"Error on page {page_num}: {e}")
                continue

    scrape_reviews()

```

driver.quit()

Review No 1:

Customer: Larra

Date: Reviewed Oct. 20, 2024

Rating: 4 stars

Review: I have had Marriott Bonvoy card with points for about 3 years now. I have never had any trouble booking or canceling a reservation. If you use their app the booking results in cheaper points for the room. You have 24 hours prior to cancel with no fee and they return the points to your card. We have used them for vacation and my husband drives a truck so on the fly it is super easy if he needs a room for the night to see what is available and use our points. We haven't had an issue with Marriott hotels. We never book through a 3rd party.

Services Rated: Online & App

Verified Purchase: No

Review No 2:

Customer: Brigina

Date: Reviewed May 21, 2024

Rating: 4 stars

Review: It's sad to say that the customer service they are provided by the gentleman David at the front counter was excellent, but they should reconsider their policy of charging \$25 per night for parking.. We paid almost \$400 just for 3 nights in the hotel and then on top of that To be charged \$25 per night For parking. We could have gone to a different name brand hotel which would have been cheaper and not even charged for parking. We choose Marriott because we like the brand but after this encounter, we will be terminating our Bonvoy account and reaching out to other hotels for our future visits.

Services Rated: Customer Service, Price

Verified Purchase: Yes

Review No 3:

Customer: Home Sweet

Date: Reviewed April 11, 2024

Rating: 4 stars

Review: Great experience with Kash. Great customer service. This was my first time coming to this hotel. Rooms are pretty nice also. My kids enjoyed the free beverage given at the time of check in. The rooms are nice and clean.

Services Rated: Customer Service

Verified Purchase: No

Review No 4:

Customer: Karena

Date: Reviewed April 9, 2024

Rating: 5 stars

Review: My husband, nephew, and I stayed at the Fairfield Inn and Suites by Marriott in Avon, Ohio, to view and photograph the Solar Eclipse on April 8. I had talked to several front desk staff members prior to our stay and asked about room types. Carmen and Lisa were so nice and accommodating. Most reviews on Trip Advisor were positive and we looked forward to our first stay there. When we arrived on Friday, April 5, Pam, the manager, greeted us. WOW! She has the brightest smile and the personality to go with it! She was working at the hotel for all five days of our stay. She was always smiling, and even when things got stressful at the front desk, she was pleasant. Haley is another staff member who is at the top of our list of people to comment on. She had a smile for every person! Housekeeping staff were also professional and pleasant. We had a King Suite, which is one of the nicest room types that we have stayed in.

Services Rated: Staff

Verified Purchase: No

Review No 5:

Customer: Deanna

Date: Reviewed Jan. 11, 2024

Rating: 5 stars

Review: Eddie (Eduardo) at the Miami Dolphin Mall Marriot was extremely friendly. I had such a great experience because Eddie was so happy and kind every time I walked through the front door. All of the front desks people were also very friendly. They went out of their way to be accommodating. For example, my key wouldn't work for the gym. After the front desk helped me in, they brought me a water as well. If I have the opportunity, I will definitely go back to this hotel.

Services Rated: Staff

Verified Purchase: No

Review No 6:

Customer: Rahn

Date: Reviewed Nov. 26, 2024

Rating: 1 stars

Review: I was being deployed to Austin Texas for FEMA. I called various hotels and explained I was only authorized for \$110/night. Residence Inn Austin South agreed to this pricing! When I checked in it was acceptable but when I checked out they charged me \$159/night!! REFUSED to make the bill right!! REFUSED to charge taxes! DO NOT STAY HERE!! RIPOFF ESTABLISHMENT!! THEY HAD A STOLEN CAR STRIPPED IN THE PARKING LOT!!

Services Rated: No services rated

Verified Purchase: No

Review No 7:

Customer: Donald

Date: Reviewed Nov. 19, 2024

Rating: 1 stars

Review: I am writing to express my extreme disappointment with my recent stay at the MGM Signature. Despite the hotel being advertised as a Marriott Bonvoy partner, we encountered numerous issues that significantly detracted from our experience. Firstly, the hotel staff, with the exception of Omar and Betty, were unhelpful and unprofessional. They refused to recognize our Marriott Bonvoy membership, despite the booking being made through Concur, our company's travel agency. This led to unnecessary charges, such as an early check-in fee and a fee for a basic room upgrade, which is atypical for Marriott properties.

Services Rated: Sales & Marketing, Price, Staff

Verified Purchase: Yes

Review No 8:

Customer: Lynda

Date: Reviewed Nov. 17, 2024

Rating: 2 stars

Review: Yes, we booked a nonrefundable stay at Georgetown Marriott expecting to witness the Inauguration of Kamala Harris. We paid an outrageous \$1000 per night as few reservations were available through the area and proximity was a priority for medical concerns. We asked for a check in dates or a transfer to another Marriott in the future. We will be out \$3000 plus tax and other fees. Obviously, others interested in the 2025 Inauguration will be seeking Marriott accommodations. This would be a win/win for all concerned. Marriott makes more money, a Republican family takes the booking and my family keeps their loyalty as Marriott Bonvoy members.

Services Rated: No services rated

Verified Purchase: Yes

Review No 9:

Customer: Melissa

Date: Reviewed Oct. 15, 2024

Rating: 1 stars

Review: Arrived after long travel to hotel with no hot water that they were previously aware of, would not have for a few days. Failed to notify guest, we were left late at night in almost sold out city, no help. Even if they had made an attempt to reach out earlier in the day we could have made arrangements. Front desk refused to give her name, said no manager to contact, all off duty and could not assist with any numbers or people to help. I have the entire conversations with the front desk on video, it is utterly ridiculous. We even stopped at a

store nearby before going to check in because we had the suite with kitchenette and wanted to have food on hand for my diabetic mother. Had to let it go to waste.

Services Rated: Price, Punctuality & Speed, Staff

Verified Purchase: Yes

Review No 10:

Customer: Allegra

Date: Reviewed Oct. 14, 2024

Rating: 1 stars

Review: I stayed at the Marriott Bonvoy in Portsmouth from 10/10-10/13 for a conference. The conference booked a block of rooms for conference attendees, so I booked a stay there. It was a big mistake.

Problems with our stay:

Services Rated: Staff

Verified Purchase: No

Review No 11:

Customer: Lynda

Date: Reviewed Nov. 17, 2024

Rating: 2 stars

Review: Yes, we booked a nonrefundable stay at Georgetown Marriott expecting to witness the Inauguration of Kamala Harris. We paid an outrageous \$1000 per night as few reservations were available through the area and proximity was a priority for medical concerns. We asked for a check in dates or a transfer to another Marriott in the future. We will be out \$3000 plus tax and other fees. Obviously, others interested in the 2025 Inauguration will be seeking Marriott accommodations. This would be a win/win for all concerned. Marriott makes more money, a Republican family takes the booking and my family keeps their loyalty as Marriott Bonvoy members.

Services Rated: No services rated

Verified Purchase: Yes

Review No 12:

Customer: Cindy

Date: Reviewed July 6, 2024

Rating: 2 stars

Review: We stayed at Marriott in Covington, KY over the 4th of July 2024. Hotel went through renovations and was a disappointment. Floors were dirty and sticky, no hooks in bathroom to hang clothes or towels and no exhaust fan. Lighting in bathroom was very dim with no way of making it brighter. You have to pay for parking each time you leave the parking garage. That adds up quickly if you come and go a few times. Strongly feel the hotel should provide free parking since they charge enough for the rooms. The hotel only had 1 restaurant (other

one closed after renovations) and did not provide a good selection. Food was decent but overpriced. Had to have bed mattress replaced due to feeling the springs. Took over 2 hrs for this to be swapped out. Don't feel we'll be staying at any Marriott's anytime soon.
Services Rated: Price, Punctuality & Speed
Verified Purchase: No

Review No 13:
Customer: TK0
Date: Reviewed May 9, 2024
Rating: 2 stars
Review: Adolphus hotel in Dallas Texas. If you're wearing high heels, please beware of the escalator in the main lobby area of the hotel. My heel got stuck but fortunately I was able to get my foot out just inches before my shoe was shredded at the bottom of escalator.
Services Rated: No services rated
Verified Purchase: No

Review No 14:
Customer: Luis
Date: Reviewed Jan. 30, 2024
Rating: 2 stars
Review: In August 2023 I joined Bonvoy to take advantage of the 3 free days after expending \$3000 in first three months. Me, ANA ** and my husband LUIS **, opened a Chase Visa account, and spent over \$5000 on this card. Our points and our 3 free nights (150000 pts) were never deposited in our own account. Instead, they made a mess and apparently is my father in law who lives in Brazil, AND IS NOT A CHASE CARD MEMBER IN OUR ACCOUNT. He is getting our points and MARRIOTT NEEDS TO CALL US IF THEY NEED MORE DETAILS. They don't want to credit my 3 nights and our points to our account.
Services Rated: Customer Service, Staff
Verified Purchase: No

Review No 15:
Customer: Mitchell
Date: Reviewed Oct. 2, 2023
Rating: 2 stars
Review: Springhill Suites Myrtle Beach Oceanfront 3rd week Sept 2023; Newer hotel that has potential, but many flaws. First, did you know that you can only leave a review for your Marriott hotel on their website if Marriott invites you to leave a review? If you complain at the hotel about any issues, it is unlikely you will get invited to leave a review. Even as a newer hotel, this hotel website only gets a 4.2. Some lesser reviews must have squeaked through!
Services Rated: Price, Staff

Verified Purchase: No

Review No 16:

Customer: Deb

Date: Reviewed April 5, 2023

Rating: 2 stars

Review: Experienced another Marriott deceptive practice. After experiencing how the chain processes their transactions against a customers card, one to which they deny but has been verified with my bank. They send an authorization request to your bank upon check in and instead of using that same authorization number to process the charges when you check out, they submit a second authorization request to your bank for the final charges. Resulting in duplicate amount of charges frozen on your account,(if using a debit/bank card) until your bank receives the charges to one if the two authorizations they gave to the hotel. Now, I have experienced the hotel moving my reservation which was booked in advance and charging me the rate of the day which was \$800 more than the rate originally booked.

Services Rated: No services rated

Verified Purchase: No

Review No 17:

Customer: Dewayne

Date: Reviewed April 4, 2023

Rating: 2 stars

Review: Marriott should be ashamed to put their name on this product. Just came back from a month where we stayed at four Marriott hotels and three (Nashville, Jacksonville, Louisville) were five of five star rooms I would be generous if I gave the Villages a ONE! All businesses need a cash cow but this should have been given to a Motel 6 years ago. The facilities were way too old and not refurbished, service/linens/cleanliness (I could go on forever) were very very subpar. After seeing Trip Advisor I obviously need to be much more careful using the Marriott product in the future. Shame on Marriott Management.

Services Rated: No services rated

Verified Purchase: No

Review No 18:

Customer: Emily

Date: Reviewed Aug. 21, 2021

Rating: 2 stars

Review: I had a recent stay at Fairfield Inn. I booked last minute in the middle of a 3 day power outage with on a dark a s story night. I discovered after I was dropped off at the hotel that my wallet was back in my dark powerless home. The staff was extremely rude, no

empathy for my situation and I did not get a proper explanation as to why I could not Check into the hotel with proof of my booking and other identification of who I was on me. The best they could do was put me on a phone with a rude manager who suggested I walk away from my non refundable booking and go to another hotel. I finally had my dad find my id and stop it off. The room was clean but uncomfortable mattress, and fluorescent outdoor light that filtered in the room.
Services Rated: Customer Service, Staff
Verified Purchase: Yes

Review No 19:

Customer: RICK

Date: Reviewed June 21, 2021

Rating: 2 stars

Review: Upon arrival at the Hotel their Computer Reservation System was not working. They could not swipe my Credit Card, but I returned the next morning and presented them with my Capital MasterCard. After returning home, I discovered they had a Netspend Visa Debit Card on File, and billed both my MasterCard and Visa. Told I was due an \$813.00 Credit to my Visa Card, but nothing to date 2 weeks later and emails to both Marriott.com and directly to the Courtyard Hotel in Aruba. They took my money in one quick swipe but cannot seem to figure how to credit their error which they keep acknowledging. No Excuse - Poor Billing and Front Desk operation.

Services Rated: Customer Service

Verified Purchase: No

Review No 20:

Customer: howard

Date: Reviewed April 23, 2021

Rating: 2 stars

Review: Went to Marriot in Santa Marta Colombia with a group. Clean hotel, advertised a large room, gave me half of what I wanted, breakfast poor at best, dinners very good, poolside waiter staff excellent, nice pool, bathroom counter almost ripped off wall, and left with a positive PCR test while there... What else can a person say??

Services Rated: Sales & Marketing, Staff

Verified Purchase: No

Review No 21:

Customer: Lynda

Date: Reviewed Nov. 17, 2024

Rating: 2 stars

Review: Yes, we booked a nonrefundable stay at Georgetown Marriott expecting to witness the Inauguration of Kamala Harris. We paid an

outrageous \$1000 per night as few reservations were available through the area and proximity was a priority for medical concerns. We asked for a check in dates or a transfer to another Marriott in the future. We will be out \$3000 plus tax and other fees. Obviously, others interested in the 2025 Inauguration will be seeking Marriott accommodations. This would be a win/win for all concerned. Marriott makes more money, a Republican family takes the booking and my family keeps their loyalty as Marriott Bonvoy members.
Services Rated: No services rated
Verified Purchase: Yes

Review No 22:
Customer: Cindy
Date: Reviewed July 6, 2024
Rating: 2 stars
Review: We stayed at Marriott in Covington, KY over the 4th of July 2024. Hotel went through renovations and was a disappointment. Floors were dirty and sticky, no hooks in bathroom to hang clothes or towels and no exhaust fan. Lighting in bathroom was very dim with no way of making it brighter. You have to pay for parking each time you leave the parking garage. That adds up quickly if you come and go a few times. Strongly feel the hotel should provide free parking since they charge enough for the rooms. The hotel only had 1 restaurant (other one closed after renovations) and did not provide a good selection. Food was decent but overpriced. Had to have bed mattress replaced due to feeling the springs. Took over 2 hrs for this to be swapped out. Don't feel we'll be staying at any Marriott's anytime soon.
Services Rated: Price, Punctuality & Speed
Verified Purchase: No

Review No 23:
Customer: TK0
Date: Reviewed May 9, 2024
Rating: 2 stars
Review: Adolphus hotel in Dallas Texas. If you're wearing high heels, please beware of the escalator in the main lobby area of the hotel. My heel got stuck but fortunately I was able to get my foot out just inches before my shoe was shredded at the bottom of escalator.
Services Rated: No services rated
Verified Purchase: No

Review No 24:
Customer: Luis
Date: Reviewed Jan. 30, 2024
Rating: 2 stars
Review: In August 2023 I joined Bonvoy to take advantage of the 3 free

days after expending \$3000 in first three months. Me, ANA ** and my husband LUIS **, opened a Chase Visa account, and spent over \$5000 on this card. Our points and our 3 free nights (150000 pts) were never deposited in our own account. Instead, they made a mess and apparently is my father in law who lives in Brazil, AND IS NOT A CHASE CARD MEMBER IN OUR ACCOUNT. He is getting our points and MARRIOTT NEEDS TO CALL US IF THEY NEED MORE DETAILS. They don't want to credit my 3 nights and our points to our account.
Services Rated: Customer Service, Staff
Verified Purchase: No

Review No 25:
Customer: Mitchell
Date: Reviewed Oct. 2, 2023
Rating: 2 stars
Review: Springhill Suites Myrtle Beach Oceanfront 3rd week Sept 2023; Newer hotel that has potential, but many flaws. First, did you know that you can only leave a review for your Marriott hotel on their website if Marriott invites you to leave a review? If you complain at the hotel about any issues, it is unlikely you will get invited to leave a review. Even as a newer hotel, this hotel website only gets a 4.2. Some lesser reviews must have squeaked through!
Services Rated: Price, Staff
Verified Purchase: No

Review No 26:
Customer: Deb
Date: Reviewed April 5, 2023
Rating: 2 stars
Review: Experienced another Marriott deceptive practice. After experiencing how the chain processes their transactions against a customers card, one to which they deny but has been verified with my bank. They send an authorization request to your bank upon check in and instead of using that same authorization number to process the charges when you check out, they submit a second authorization request to your bank for the final charges. Resulting in duplicate amount of charges frozen on your account,(if using a debit/bank card) until your bank receives the charges to one if the two authorizations they gave to the hotel. Now, I have experienced the hotel moving my reservation which was booked in advance and charging me the rate of the day which was \$800 more than the rate originally booked.
Services Rated: No services rated
Verified Purchase: No

Review No 27:
Customer: Dewayne

Date: Reviewed April 4, 2023

Rating: 2 stars

Review: Marriott should be ashamed to put their name on this product. Just came back from a month where we stayed at four Marriott hotels and three (Nashville, Jacksonville, Louisville) were five of five star rooms I would be generous if I gave the Villages a ONE! All businesses need a cash cow but this should have been given to a Motel 6 years ago. The facilities were way too old and not refurbished, service/linens/cleanliness (I could go on forever) were very very subpar. After seeing Trip Advisor I obviously need to be much more careful using the Marriott product in the future. Shame on Marriott Management.

Services Rated: No services rated

Verified Purchase: No

Review No 28:

Customer: Emily

Date: Reviewed Aug. 21, 2021

Rating: 2 stars

Review: I had a recent stay at Fairfield Inn. I booked last minute in the middle of a 3 day power outage with on a dark a s story night. I discovered after I was dropped off at the hotel that my wallet was back in my dark powerless home. The staff was extremely rude, no empathy for my situation and I did not get a proper explanation as to why I could not Check into the hotel with proof of my booking and other identification of who I was on me. The best they could do was put me on a phone with a rude manager who suggested I walk away from my non refundable booking and go to another hotel. I finally had my dad find my id and stop it off. The room was clean but uncomfortable mattress, and fluorescent outdoor light that filtered in the room.

Services Rated: Customer Service, Staff

Verified Purchase: Yes

Review No 29:

Customer: RICK

Date: Reviewed June 21, 2021

Rating: 2 stars

Review: Upon arrival at the Hotel their Computer Reservation System was not working. They could not swipe my Credit Card, but I returned the next morning and presented them with my Capital MasterCard. After returning home, I discovered they had a Netspend Visa Debit Card on File, and billed both my MasterCard and Visa. Told I was due an \$813.00 Credit to my Visa Card, but nothing to date 2 weeks later and emails to both Marriott.com and directly to the Courtyard Hotel in Aruba. They took my money in one quick swipe but cannot seem to figure how to credit their error which they keep acknowledging. No Excuse - Poor Billing and Front Desk operation.

Services Rated: Customer Service

Verified Purchase: No

Review No 30:

Customer: howard

Date: Reviewed April 23, 2021

Rating: 2 stars

Review: Went to Marriot in Santa Marta Colombia with a group. Clean hotel, advertised a large room, gave me half of what I wanted, breakfast poor at best, dinners very good, poolside waiter staff excellent, nice pool, bathroom counter almost ripped off wall, and left with a positive PCR test while there... What else can a person say??

Services Rated: Sales & Marketing, Staff

Verified Purchase: No

Review No 31:

Customer: Lynda

Date: Reviewed Nov. 17, 2024

Rating: 2 stars

Review: Yes, we booked a nonrefundable stay at Georgetown Marriott expecting to witness the Inauguration of Kamala Harris. We paid an outrageous \$1000 per night as few reservations were available through the area and proximity was a priority for medical concerns. We asked for a check in dates or a transfer to another Marriott in the future. We will be out \$3000 plus tax and other fees. Obviously, others interested in the 2025 Inauguration will be seeking Marriott accommodations. This would be a win/win for all concerned. Marriott makes more money, a Republican family takes the booking and my family keeps their loyalty as Marriott Bonvoy members.

Services Rated: No services rated

Verified Purchase: Yes

Review No 32:

Customer: Cindy

Date: Reviewed July 6, 2024

Rating: 2 stars

Review: We stayed at Marriott in Covington, KY over the 4th of July 2024. Hotel went through renovations and was a disappointment. Floors were dirty and sticky, no hooks in bathroom to hang clothes or towels and no exhaust fan. Lighting in bathroom was very dim with no way of making it brighter. You have to pay for parking each time you leave the parking garage. That adds up quickly if you come and go a few times. Strongly feel the hotel should provide free parking since they charge enough for the rooms. The hotel only had 1 restaurant (other one closed after renovations) and did not provide a good selection. Food was decent but overpriced. Had to have bed mattress replaced due

to feeling the springs. Took over 2 hrs for this to be swapped out.
Don't feel we'll be staying at any Marriott's anytime soon.
Services Rated: Price, Punctuality & Speed
Verified Purchase: No

Review No 33:

Customer: TK0

Date: Reviewed May 9, 2024

Rating: 2 stars

Review: Adolphus hotel in Dallas Texas. If you're wearing high heels, please beware of the escalator in the main lobby area of the hotel. My heel got stuck but fortunately I was able to get my foot out just inches before my shoe was shredded at the bottom of escalator.

Services Rated: No services rated

Verified Purchase: No

Review No 34:

Customer: Luis

Date: Reviewed Jan. 30, 2024

Rating: 2 stars

Review: In August 2023 I joined Bonvoy to take advantage of the 3 free days after expending \$3000 in first three months. Me, ANA ** and my husband LUIS **, opened a Chase Visa account, and spent over \$5000 on this card. Our points and our 3 free nights (150000 pts) were never deposited in our own account. Instead, they made a mess and apparently is my father in law who lives in Brazil, AND IS NOT A CHASE CARD MEMBER IN OUR ACCOUNT. He is getting our points and MARRIOTT NEEDS TO CALL US IF THEY NEED MORE DETAILS. They don't want to credit my 3 nights and our points to our account.

Services Rated: Customer Service, Staff

Verified Purchase: No

Review No 35:

Customer: Mitchell

Date: Reviewed Oct. 2, 2023

Rating: 2 stars

Review: Springhill Suites Myrtle Beach Oceanfront 3rd week Sept 2023; Newer hotel that has potential, but many flaws. First, did you know that you can only leave a review for your Marriott hotel on their website if Marriott invites you to leave a review? If you complain at the hotel about any issues, it is unlikely you will get invited to leave a review. Even as a newer hotel, this hotel website only gets a 4.2. Some lesser reviews must have squeaked through!

Services Rated: Price, Staff

Verified Purchase: No

Review No 36:

Customer: Deb

Date: Reviewed April 5, 2023

Rating: 2 stars

Review: Experienced another Marriott deceptive practice. After experiencing how the chain processes their transactions against a customers card, one to which they deny but has been verified with my bank. They send an authorization request to your bank upon check in and instead of using that same authorization number to process the charges when you check out, they submit a second authorization request to your bank for the final charges. Resulting in duplicate amount of charges frozen on your account,(if using a debit/bank card) until your bank receives the charges to one if the two authorizations they gave to the hotel. Now, I have experienced the hotel moving my reservation which was booked in advance and charging me the rate of the day which was \$800 more than the rate originally booked.

Services Rated: No services rated

Verified Purchase: No

Review No 37:

Customer: Dewayne

Date: Reviewed April 4, 2023

Rating: 2 stars

Review: Marriott should be ashamed to put their name on this product. Just came back from a month where we stayed at four Marriott hotels and three (Nashville, Jacksonville, Louisville) were five of five star rooms I would be generous if I gave the Villages a ONE! All businesses need a cash cow but this should have been given to a Motel 6 years ago. The facilities were way too old and not refurbished, service/linens/cleanliness (I could go on forever) were very very subpar. After seeing Trip Advisor I obviously need to be much more careful using the Marriott product in the future. Shame on Marriott Management.

Services Rated: No services rated

Verified Purchase: No

Review No 38:

Customer: Emily

Date: Reviewed Aug. 21, 2021

Rating: 2 stars

Review: I had a recent stay at Fairfield Inn. I booked last minute in the middle of a 3 day power outage with on a dark a s story night. I discovered after I was dropped off at the hotel that my wallet was back in my dark powerless home. The staff was extremely rude, no empathy for my situation and I did not get a proper explanation as to why I could not Check into the hotel with proof of my booking and

other identification of who I was on me. The best they could do was put me on a phone with a rude manager who suggested I walk away from my non refundable booking and go to another hotel. I finally had my dad find my id and stop it off. The room was clean but uncomfortable mattress, and fluorescent outdoor light that filtered in the room.
Services Rated: Customer Service, Staff
Verified Purchase: Yes

Review No 39:

Customer: RICK

Date: Reviewed June 21, 2021

Rating: 2 stars

Review: Upon arrival at the Hotel their Computer Reservation System was not working. They could not swipe my Credit Card, but I returned the next morning and presented them with my Capital MasterCard. After returning home, I discovered they had a Netspend Visa Debit Card on File, and billed both my MasterCard and Visa. Told I was due an \$813.00 Credit to my Visa Card, but nothing to date 2 weeks later and emails to both Marriott.com and directly to the Courtyard Hotel in Aruba. They took my money in one quick swipe but cannot seem to figure how to credit their error which they keep acknowledging. No Excuse - Poor Billing and Front Desk operation.

Services Rated: Customer Service

Verified Purchase: No

Review No 40:

Customer: howard

Date: Reviewed April 23, 2021

Rating: 2 stars

Review: Went to Marriot in Santa Marta Colombia with a group. Clean hotel, advertised a large room, gave me half of what I wanted, breakfast poor at best, dinners very good, poolside waiter staff excellent, nice pool, bathroom counter almost ripped off wall, and left with a positive PCR test while there... What else can a person say??

Services Rated: Sales & Marketing, Staff

Verified Purchase: No

Error on page 5: Message: no such element: Unable to locate element:
{"method":"link text","selector":"5"}

(Session info: chrome=131.0.6778.86); For documentation on this error, please visit:

<https://www.selenium.dev/documentation/webdriver/troubleshooting/errors/no-such-element-exception>

Stacktrace:

GetHandleVerifier [0x00B533E3+25059]

```

(No symbol) [0x00ADCDE4]
(No symbol) [0x009BBEC3]
(No symbol) [0x009FFD86]
(No symbol) [0x009FFFCB]
(No symbol) [0x00A3D952]
(No symbol) [0x00A21F44]
(No symbol) [0x00A3B51E]
(No symbol) [0x00A21C96]
(No symbol) [0x009F3FAC]
(No symbol) [0x009F4F3D]
GetHandleVerifier [0x00E45543+3113795]
GetHandleVerifier [0x00E5A20A+3198986]
GetHandleVerifier [0x00E529E2+3168226]
GetHandleVerifier [0x00BF3250+680016]
(No symbol) [0x00AE572D]
(No symbol) [0x00AE29D8]
(No symbol) [0x00AE2B75]
(No symbol) [0x00AD57D0]
BaseThreadInitThunk [0x76B67BA9+25]
RtlInitializeExceptionChain [0x7705C0CB+107]
RtlClearBits [0x7705C04F+191]

```

```

import pandas as pd
df1=pd.read_csv('marriott_reviews.csv')
df1

```

	Review No	Customer Name	Date	Rating	\
0	1	Larra	Reviewed Oct. 20, 2024	4 stars	
1	2	Brigina	Reviewed May 21, 2024	4 stars	
2	3	Home Sweet	Reviewed April 11, 2024	4 stars	
3	4	Karena	Reviewed April 9, 2024	5 stars	
4	5	Deanna	Reviewed Jan. 11, 2024	5 stars	
5	6	Rahn	Reviewed Nov. 26, 2024	1 stars	
6	7	Donald	Reviewed Nov. 19, 2024	1 stars	
7	8	Lynda	Reviewed Nov. 17, 2024	2 stars	
8	9	Melissa	Reviewed Oct. 15, 2024	1 stars	
9	10	Allegra	Reviewed Oct. 14, 2024	1 stars	
10	11	Lynda	Reviewed Nov. 17, 2024	2 stars	
11	12	Cindy	Reviewed July 6, 2024	2 stars	
12	13	TKO	Reviewed May 9, 2024	2 stars	
13	14	Luis	Reviewed Jan. 30, 2024	2 stars	
14	15	Mitchell	Reviewed Oct. 2, 2023	2 stars	
15	16	Deb	Reviewed April 5, 2023	2 stars	
16	17	Dewayne	Reviewed April 4, 2023	2 stars	
17	18	Emily	Reviewed Aug. 21, 2021	2 stars	
18	19	RICK	Reviewed June 21, 2021	2 stars	
19	20	howard	Reviewed April 23, 2021	2 stars	
20	21	Lynda	Reviewed Nov. 17, 2024	2 stars	
21	22	Cindy	Reviewed July 6, 2024	2 stars	

22	23	TKO	Reviewed May 9, 2024	2 stars
23	24	Luis	Reviewed Jan. 30, 2024	2 stars
24	25	Mitchell	Reviewed Oct. 2, 2023	2 stars
25	26	Deb	Reviewed April 5, 2023	2 stars
26	27	Dewayne	Reviewed April 4, 2023	2 stars
27	28	Emily	Reviewed Aug. 21, 2021	2 stars
28	29	RICK	Reviewed June 21, 2021	2 stars
29	30	howard	Reviewed April 23, 2021	2 stars
30	31	Lynda	Reviewed Nov. 17, 2024	2 stars
31	32	Cindy	Reviewed July 6, 2024	2 stars
32	33	TKO	Reviewed May 9, 2024	2 stars
33	34	Luis	Reviewed Jan. 30, 2024	2 stars
34	35	Mitchell	Reviewed Oct. 2, 2023	2 stars
35	36	Deb	Reviewed April 5, 2023	2 stars
36	37	Dewayne	Reviewed April 4, 2023	2 stars
37	38	Emily	Reviewed Aug. 21, 2021	2 stars
38	39	RICK	Reviewed June 21, 2021	2 stars
39	40	howard	Reviewed April 23, 2021	2 stars

Review \

0 I have had Marriott Bonvoy card with points fo...
1 It's sad to say that the customer service they...
2 Great experience with Kash. Great customer ser...
3 My husband, nephew, and I stayed at the Fairfi...
4 Eddie (Eduardo) at the Miami Dolphin Mall Marr...
5 I was being deployed to Austin Texas for FEMA....
6 I am writing to express my extreme disappointm...
7 Yes, we booked a nonrefundable stay at Georget...
8 Arrived after long travel to hotel with no hot...
9 I stayed at the Marriott Bonvoy in Portsmouth ...
10 Yes, we booked a nonrefundable stay at Georget...
11 We stayed at Marriott in Covington, KY over th...
12 Adolphus hotel in Dallas Texas. If you're wear...
13 In August 2023 I joined Bonvoy to take advanta...
14 Springhill Suites Myrtle Beach Oceanfront 3rd ...
15 Experienced another Marriott deceptive practic...
16 Marriott should be ashamed to put their name o...
17 I had a recent stay at Fairfield Inn. I booked...
18 Upon arrival at the Hotel their Computer Reser...
19 Went to Marriot in Santa Marta Colombia with a...
20 Yes, we booked a nonrefundable stay at Georget...
21 We stayed at Marriott in Covington, KY over th...
22 Adolphus hotel in Dallas Texas. If you're wear...
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28 Upon arrival at the Hotel their Computer Reser...

29 Went to Marriot in Santa Marta Colombia with a...
 30 Yes, we booked a nonrefundable stay at Georget...
 31 We stayed at Marriott in Covington, KY over th...
 32 Adolphus hotel in Dallas Texas. If you're wear...
 33 In August 2023 I joined Bonvoy to take advanta...
 34 Springhill Suites Myrtle Beach Oceanfront 3rd ...
 35 Experienced another Marriott deceptive practic...
 36 Marriott should be ashamed to put their name o...
 37 I had a recent stay at Fairfield Inn. I booked...
 38 Upon arrival at the Hotel their Computer Reser...
 39 Went to Marriot in Santa Marta Colombia with a...

	Services Rated	Verified Purchase
0	Online & App	No
1	Customer Service, Price	Yes
2	Customer Service	No
3	Staff	No
4	Staff	No
5	No services rated	No
6	Sales & Marketing, Price, Staff	Yes
7	No services rated	Yes
8	Price, Punctuality & Speed, Staff	Yes
9	Staff	No
10	No services rated	Yes
11	Price, Punctuality & Speed	No
12	No services rated	No
13	Customer Service, Staff	No
14	Price, Staff	No
15	No services rated	No
16	No services rated	No
17	Customer Service, Staff	Yes
18	Customer Service	No
19	Sales & Marketing, Staff	No
20	No services rated	Yes
21	Price, Punctuality & Speed	No
22	No services rated	No
23	Customer Service, Staff	No
24	Price, Staff	No
25	No services rated	No
26	No services rated	No
27	Customer Service, Staff	Yes
28	Customer Service	No
29	Sales & Marketing, Staff	No
30	No services rated	Yes
31	Price, Punctuality & Speed	No
32	No services rated	No
33	Customer Service, Staff	No
34	Price, Staff	No
35	No services rated	No

36	No services rated	No
37	Customer Service, Staff	Yes
38	Customer Service	No
39	Sales & Marketing, Staff	No

```
df1=df1[['Review','Rating']]
```

```
data=pd.concat([df1,df])
data
```

	Review	Rating
0	I have had Marriott Bonvoy card with points fo...	4 stars
1	It's sad to say that the customer service they...	4 stars
2	Great experience with Kash. Great customer ser...	4 stars
3	My husband, nephew, and I stayed at the Fairfi...	5 stars
4	Eddie (Eduardo) at the Miami Dolphin Mall Marr...	5 stars
...
20484	deceptive staff deceptive desk staff claiming ...	2
20485	not impressed unfriendly staff checked asked h...	2
20488	ok just looks nice modern outside, desk staff ...	2
20489	hotel theft ruined vacation hotel opened sept ...	1
20490	people talking, ca n't believe excellent ratin...	2

```
[3254 rows x 2 columns]
```

```
!pip install pandas
!pip install scikit-learn
!pip install nltk
!pip install gensim
!pip install imbalanced-learn
```

```
Requirement already satisfied: pandas in c:\users\himaj\appdata\local\
packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (2.2.3)
```

```
Requirement already satisfied: numpy>=1.23.2 in c:\users\himaj\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from pandas) (1.26.4)
```

```
Requirement already satisfied: python-dateutil>=2.8.2 in c:\users\
himaj\appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from pandas) (2.9.0.post0)
```

```
Requirement already satisfied: pytz>=2020.1 in c:\users\himaj\appdata\
local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\
localcache\local-packages\python311\site-packages (from pandas)
(2024.2)
```

```
Requirement already satisfied: tzdata>=2022.7 in c:\users\himaj\
appdata\local\packages\
pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-
packages\python311\site-packages (from pandas) (2024.2)
```

Requirement already satisfied: six>=1.5 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from python-dateutil>=2.8.2->pandas) (1.16.0)

[notice] A new release of pip is available: 24.0 -> 24.3.1
[notice] To update, run: C:\Users\himaj\AppData\Local\Microsoft\WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\python.exe -m pip install --upgrade pip

Requirement already satisfied: scikit-learn in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (1.5.2)

Requirement already satisfied: numpy>=1.19.5 in c:\users\himaj\appdata\local\packages\

pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from scikit-learn) (1.26.4)

Requirement already satisfied: scipy>=1.6.0 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from scikit-learn) (1.13.1)

Requirement already satisfied: joblib>=1.2.0 in c:\users\himaj\appdata\local\packages\

pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from scikit-learn) (1.4.2)

Requirement already satisfied: threadpoolctl>=3.1.0 in c:\users\himaj\appdata\local\packages\

pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from scikit-learn) (3.5.0)

[notice] A new release of pip is available: 24.0 -> 24.3.1

[notice] To update, run: C:\Users\himaj\AppData\Local\Microsoft\WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\python.exe -m pip install --upgrade pip

Requirement already satisfied: nltk in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (3.9.1)

Requirement already satisfied: click in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from nltk) (8.1.7)

Requirement already satisfied: joblib in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from nltk) (1.4.2)

Requirement already satisfied: regex>=2021.8.3 in c:\users\himaj\appdata\local\packages\

pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from nltk) (2024.9.11)

Requirement already satisfied: tqdm in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from nltk) (4.66.6)
Requirement already satisfied: colorama in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from click->nltk) (0.4.6)

[notice] A new release of pip is available: 24.0 -> 24.3.1
[notice] To update, run: C:\Users\himaj\AppData\Local\Microsoft\WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\python.exe -m pip install --upgrade pip

Requirement already satisfied: gensim in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (4.3.3)
Requirement already satisfied: numpy<2.0,>=1.18.5 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from gensim) (1.26.4)
Requirement already satisfied: scipy<1.14.0,>=1.7.0 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from gensim) (1.13.1)
Requirement already satisfied: smart-open>=1.8.1 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from gensim) (7.0.5)
Requirement already satisfied: wrapt in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from smart-open>=1.8.1->gensim) (1.16.0)

[notice] A new release of pip is available: 24.0 -> 24.3.1
[notice] To update, run: C:\Users\himaj\AppData\Local\Microsoft\WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\python.exe -m pip install --upgrade pip

Requirement already satisfied: imbalanced-learn in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (0.12.4)
Requirement already satisfied: numpy>=1.17.3 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from imbalanced-learn) (1.26.4)
Requirement already satisfied: scipy>=1.5.0 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\

```
localcache\local-packages\python311\site-packages (from imbalanced-learn) (1.13.1)
Requirement already satisfied: scikit-learn>=1.0.2 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from imbalanced-learn) (1.5.2)
Requirement already satisfied: joblib>=1.1.1 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from imbalanced-learn) (1.4.2)
Requirement already satisfied: threadpoolctl>=2.0.0 in c:\users\himaj\appdata\local\packages\pythonsoftwarefoundation.python.3.11_qbz5n2kfra8p0\localcache\local-packages\python311\site-packages (from imbalanced-learn) (3.5.0)
```

```
[notice] A new release of pip is available: 24.0 -> 24.3.1
[notice] To update, run: C:\Users\himaj\AppData\Local\Microsoft\WindowsApps\PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\python.exe -m pip install --upgrade pip
```

```
import pandas as pd
import re
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.model_selection import train_test_split
from sklearn.multioutput import MultiOutputClassifier
from sklearn.ensemble import RandomForestClassifier
from sklearn.metrics import accuracy_score, precision_score, recall_score, f1_score
from sklearn.pipeline import Pipeline
from nltk.corpus import stopwords
from nltk.stem import WordNetLemmatizer
import nltk
from gensim.models import LdaModel
from sklearn.decomposition import NMF
from gensim.corpora import Dictionary
from sklearn.preprocessing import MultiLabelBinarizer
from sklearn.model_selection import train_test_split
from sklearn.multioutput import MultiOutputClassifier
from sklearn.svm import SVC
from sklearn.naive_bayes import MultinomialNB
from sklearn.metrics import accuracy_score, classification_report
```

```
# Download NLTK data
```

```
nltk.download('stopwords')
nltk.download('wordnet')
```

```
[nltk_data] Downloading package stopwords to
[nltk_data] C:\Users\himaj\AppData\Roaming\nltk_data...
[nltk_data] Package stopwords is already up-to-date!
```

```

[nltk_data] Downloading package wordnet to
[nltk_data] C:\Users\himaj\AppData\Roaming\nltk_data...
[nltk_data] Package wordnet is already up-to-date!

True

df.isnull().sum()

Review    0
Rating    0
dtype: int64

def clean_text(text):
    text = text.lower()
    text = re.sub(r'^a-zA-Z\s', '', text)
    return text

df['Cleaned_Review'] = df['Review'].apply(clean_text)

# Remove stop words and perform lemmatization
stop_words = set(stopwords.words('english'))
lemmatizer = WordNetLemmatizer()
def preprocess_text(text):
    words = text.split()
    words = [lemmatizer.lemmatize(word) for word in words if word not
in stop_words]
    return ' '.join(words)

df['Processed_Review'] = df['Cleaned_Review'].apply(preprocess_text)

# Topic Modeling using LDA
# Tokenize reviews for LDA
tokenized_reviews = [review.split() for review in
df['Processed_Review']]

# Create a dictionary and corpus for LDA
dictionary = Dictionary(tokenized_reviews)
corpus = [dictionary.doc2bow(review) for review in tokenized_reviews]

# Train the LDA model
num_topics = 5
lda_model = LdaModel(corpus=corpus, id2word=dictionary,
num_topics=num_topics, random_state=42, passes=10)

# Print topics
for idx, topic in lda_model.print_topics(num_words=5):
    print(f"Topic #{idx + 1}: {topic}")

Topic #1: 0.038*"hotel" + 0.034*"room" + 0.011*"stay" + 0.011*"nt" +
0.010*"night"
Topic #2: 0.037*"room" + 0.014*"hotel" + 0.013*"nt" + 0.010*"told" +

```

```

0.010*"day"
Topic #3: 0.018*"resort" + 0.014*"food" + 0.013*"beach" + 0.011*"nt" +
0.011*"day"
Topic #4: 0.008*"hotel" + 0.008*"room" + 0.004*"service" +
0.003*"kong" + 0.003*"poor"
Topic #5: 0.018*"card" + 0.011*"credit" + 0.009*"reservation" +
0.007*"booking" + 0.006*"email"

```

Using NMF for Topic Modeling

Create TF-IDF features

```

tfidf_vectorizer = TfidfVectorizer(max_features=1000)
X_tfidf = tfidf_vectorizer.fit_transform(df['Processed_Review'])

```

Train the NMF model

```

num_topics_nmf = 4 # Adjust this number based on your needs
nmf_model = NMF(n_components=num_topics_nmf, random_state=42)
W = nmf_model.fit_transform(X_tfidf) # Document-topic matrix
H = nmf_model.components_ # Topic-word matrix

```

Print NMF topics

```

print("\nNMF Topics:")
feature_names = tfidf_vectorizer.get_feature_names_out()
for topic_idx, topic in enumerate(H):
    print(f"Topic #{topic_idx + 1}: " + " ".join([feature_names[i] for
i in topic.argsort()[-5:]]))

```

NMF Topics:

```

Topic #1: small bathroom nt bed room
Topic #2: restaurant pool food beach resort
Topic #3: day nt desk told room
Topic #4: stayed stay staff star hotel

```

Multi-Label Classification Preparation

Create labels based on keywords in the review text (e.g., 'product', 'service', 'payment', 'technical')

```

def classify_labels(review):
    labels = []
    if any(word in review for word in ['product', 'price', 'item']):
        labels.append('product-related')
    if any(word in review for word in ['service', 'staff',
'customer']):
        labels.append('service-related')
    if any(word in review for word in ['payment', 'bill', 'charge']):
        labels.append('payment-related')
    if any(word in review for word in ['app', 'website',
'technical']):
        labels.append('technical-issue')
    return labels

```



```

df['Labels'] = df['Processed_Review'].apply(classify_labels)
print(df['Labels'])

1      [service-related, payment-related, technical-i...
10      [product-related, technical-issue]
15      [service-related, payment-related, technical-i...
16      [service-related, technical-issue]
24      [product-related, service-related]
...
20484      [service-related]
20485      [product-related, service-related]
20488      [product-related, service-related]
20489      [product-related, service-related, payment-rel...
20490      []
Name: Labels, Length: 3214, dtype: object

from sklearn.preprocessing import MultiLabelBinarizer
from sklearn.feature_extraction.text import TfidfVectorizer
from sklearn.model_selection import train_test_split, GridSearchCV
from sklearn.pipeline import Pipeline
from sklearn.metrics import classification_report, hamming_loss
from sklearn.multiclass import OneVsRestClassifier
from sklearn.linear_model import LogisticRegression

# Features and target
X = df['Review']
y = df['Labels']

# Convert y to binary format
mlb = MultiLabelBinarizer()
y_binary = mlb.fit_transform(y)

# Split data into train and test sets
X_train, X_test, y_train, y_test = train_test_split(X, y_binary,
test_size=0.2, random_state=42)

# TF-IDF Vectorization
tfidf = TfidfVectorizer(max_features=5000)

# Logistic Regression Pipeline
pipeline_lr = Pipeline([
    ('tfidf', tfidf),
    ('clf',
OneVsRestClassifier(LogisticRegression(solver='liblinear'))
])
param_grid_lr = {
    'clf__estimator__C': [0.01, 0.1, 1, 10],
}

# Training and evaluation

```

```

print("Training Logistic Regression...")
grid_search_lr = GridSearchCV(pipeline_lr, param_grid_lr,
scoring='f1_micro', cv=5)
grid_search_lr.fit(X_train, y_train)

# Best parameters and evaluation on test set
print(f"Best Parameters for Logistic Regression:
{grid_search_lr.best_params_}")
y_pred_lr = grid_search_lr.predict(X_test)

print("Logistic Regression Classification Report:")
print(classification_report(y_test, y_pred_lr))

```

Training Logistic Regression...

Best Parameters for Logistic Regression: {'clf__estimator__C': 10}

Logistic Regression Classification Report:

	precision	recall	f1-score	support
0	0.98	0.40	0.56	126
1	0.95	0.63	0.76	161
2	0.93	0.95	0.94	418
3	0.79	0.74	0.76	278
micro avg	0.89	0.77	0.82	983
macro avg	0.91	0.68	0.75	983
weighted avg	0.90	0.77	0.81	983
samples avg	0.71	0.66	0.66	983

```

C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
_classification.py:1531: UndefinedMetricWarning: Precision is ill-
defined and being set to 0.0 in samples with no predicted labels. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is",
len(result))

```

```

C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
_classification.py:1531: UndefinedMetricWarning: Recall is ill-defined
and being set to 0.0 in samples with no true labels. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is",
len(result))

```

```

C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
_classification.py:1531: UndefinedMetricWarning: F-score is ill-
defined and being set to 0.0 in samples with no true nor predicted

```

```
labels. Use `zero_division` parameter to control this behavior.
_warn_prf(average, modifier, f"{metric.capitalize()} is",
len(result))
```

```
from sklearn.ensemble import RandomForestClassifier
```

```
# Random Forest Pipeline
```

```
pipeline_rf = Pipeline([
    ('tfidf', tfidf),
    ('clf', OneVsRestClassifier(RandomForestClassifier()))
])
```

```
param_grid_rf = {
    'clf__estimator__n_estimators': [100, 200],
    'clf__estimator__max_depth': [None, 10, 20],
}
```

```
# Training and evaluation
```

```
print("Training Random Forest...")
```

```
grid_search_rf = GridSearchCV(pipeline_rf, param_grid_rf,
scoring='f1_micro', cv=5)
grid_search_rf.fit(X_train, y_train)
```

```
# Best parameters and evaluation on test set
```

```
print(f"Best Parameters for Random Forest:
```

```
{grid_search_rf.best_params_}")
```

```
y_pred_rf = grid_search_rf.predict(X_test)
```

```
print("Random Forest Classification Report:")
```

```
print(classification_report(y_test, y_pred_rf))
```

```
Training Random Forest...
```

```
Best Parameters for Random Forest: {'clf__estimator__max_depth': None,
'clf__estimator__n_estimators': 200}
```

```
Random Forest Classification Report:
```

	precision	recall	f1-score	support
0	1.00	0.79	0.88	126
1	1.00	0.91	0.95	161
2	0.89	0.99	0.94	418
3	0.89	0.84	0.87	278
micro avg	0.92	0.91	0.91	983
macro avg	0.94	0.88	0.91	983
weighted avg	0.92	0.91	0.91	983
samples avg	0.79	0.78	0.78	983

```
C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
```

```

_classification.py:1531: UndefinedMetricWarning: Precision is ill-
defined and being set to 0.0 in samples with no predicted labels. Use
`zero_division` parameter to control this behavior.
    _warn_prf(average, modifier, f"{metric.capitalize()} is",
len(result))
C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
_classification.py:1531: UndefinedMetricWarning: Recall is ill-defined
and being set to 0.0 in samples with no true labels. Use
`zero_division` parameter to control this behavior.
    _warn_prf(average, modifier, f"{metric.capitalize()} is",
len(result))
C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
_classification.py:1531: UndefinedMetricWarning: F-score is ill-
defined and being set to 0.0 in samples with no true nor predicted
labels. Use `zero_division` parameter to control this behavior.
    _warn_prf(average, modifier, f"{metric.capitalize()} is",
len(result))

from sklearn.naive_bayes import MultinomialNB

# Multinomial Naive Bayes Pipeline
pipeline_nb = Pipeline([
    ('tfidf', tfidf),
    ('clf', OneVsRestClassifier(MultinomialNB()))
])
param_grid_nb = {
    'clf__estimator__alpha': [0.5, 1.0]
}

# Training and evaluation
print("Training Multinomial Naive Bayes...")
grid_search_nb = GridSearchCV(pipeline_nb, param_grid_nb,
    scoring='f1_micro', cv=5)
grid_search_nb.fit(X_train, y_train)

# Best parameters and evaluation on test set
print(f"Best Parameters for Multinomial Naive Bayes:
{grid_search_nb.best_params_}")
y_pred_nb = grid_search_nb.predict(X_test)

print("Multinomial Naive Bayes Classification Report:")
print(classification_report(y_test, y_pred_nb))

Training Multinomial Naive Bayes...
Best Parameters for Multinomial Naive Bayes: {'clf__estimator__alpha':
0.5}

```

Multinomial Naive Bayes Classification Report:

	precision	recall	f1-score	support
0	1.00	0.06	0.11	126
1	0.95	0.11	0.20	161
2	0.67	0.99	0.80	418
3	0.72	0.57	0.63	278
micro avg	0.69	0.61	0.65	983
macro avg	0.83	0.43	0.43	983
weighted avg	0.77	0.61	0.57	983
samples avg	0.64	0.55	0.56	983

```
C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
_classification.py:1531: UndefinedMetricWarning: Precision is ill-
defined and being set to 0.0 in samples with no predicted labels. Use
`zero_division` parameter to control this behavior.
    _warn_prf(average, modifier, f"{metric.capitalize()} is",
len(result))
C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
_classification.py:1531: UndefinedMetricWarning: Recall is ill-defined
and being set to 0.0 in samples with no true labels. Use
`zero_division` parameter to control this behavior.
    _warn_prf(average, modifier, f"{metric.capitalize()} is",
len(result))
C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
_classification.py:1531: UndefinedMetricWarning: F-score is ill-
defined and being set to 0.0 in samples with no true nor predicted
labels. Use `zero_division` parameter to control this behavior.
    _warn_prf(average, modifier, f"{metric.capitalize()} is",
len(result))
```

```
from sklearn.svm import SVC

# Support Vector Classifier Pipeline
pipeline_svc = Pipeline([
    ('tfidf', tfidf),
    ('clf', OneVsRestClassifier(SVC(probability=True)))
])
param_grid_svc = {
    'clf__estimator__C': [0.1, 1, 10],
    'clf__estimator__kernel': ['linear', 'rbf']
}
```

```
# Training and evaluation
print("Training Support Vector Classifier...")
grid_search_svc = GridSearchCV(pipeline_svc, param_grid_svc,
scoring='f1_micro', cv=5)
grid_search_svc.fit(X_train, y_train)

# Best parameters and evaluation on test set
print(f"Best Parameters for SVC: {grid_search_svc.best_params_}")
y_pred_svc = grid_search_svc.predict(X_test)

print("SVC Classification Report:")
print(classification_report(y_test, y_pred_svc))
```

```
Training Support Vector Classifier...
Best Parameters for SVC: {'clf__estimator__C': 10,
'clf__estimator__kernel': 'linear'}
SVC Classification Report:
```

	precision	recall	f1-score	support
0	0.92	0.63	0.75	126
1	0.88	0.70	0.78	161
2	0.93	0.93	0.93	418
3	0.77	0.73	0.75	278
micro avg	0.87	0.80	0.83	983
macro avg	0.87	0.75	0.80	983
weighted avg	0.87	0.80	0.83	983
samples avg	0.72	0.68	0.68	983

```
C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
_classification.py:1531: UndefinedMetricWarning: Precision is ill-
defined and being set to 0.0 in samples with no predicted labels. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is",
len(result))
C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
_classification.py:1531: UndefinedMetricWarning: Recall is ill-defined
and being set to 0.0 in samples with no true labels. Use
`zero_division` parameter to control this behavior.
  _warn_prf(average, modifier, f"{metric.capitalize()} is",
len(result))
C:\Users\himaj\AppData\Local\Packages\
PythonSoftwareFoundation.Python.3.11_qbz5n2kfra8p0\LocalCache\local-
packages\Python311\site-packages\sklearn\metrics\
```

```
_classification.py:1531: UndefinedMetricWarning: F-score is ill-  
defined and being set to 0.0 in samples with no true nor predicted  
labels. Use `zero_division` parameter to control this behavior.  
_warn_prf(average, modifier, f"{metric.capitalize()} is",  
len(result))
```