

Customer Feedback Analyzer - Assignment

1. Problem Title

Customer Feedback Analyzer using Sentiment Analysis

2. Problem Statement

Many businesses receive hundreds of product reviews daily but cannot manually read all of them. The goal is to automatically classify each review as Positive or Negative using a sentiment analysis model, helping companies understand customer satisfaction trends quickly.

3. Project Overview

The system takes a product review as input and uses a sentiment analysis pipeline to determine whether the customer is happy or upset. It outputs a simple Positive/Negative label along with a confidence score.

4. Concepts Covered from Unit 1

This project uses the Hugging Face Sentiment Analysis pipeline: `pipeline('sentiment-analysis')`. It applies text classification concepts from Unit 1 including transformer-based pipelines, model inference, and basic NLP preprocessing.

5. Hugging Face Model(s) Used

`distilbert-base-uncased-finetuned-sst-2-english` (commonly used model for sentiment analysis).

6. Input → Process → Output Flow

Input: A product review.

Process: The review is passed into `pipeline('sentiment-analysis')`, which tokenizes the text, runs it through a trained model, and predicts whether the sentiment is positive or negative.

Output: `{'label': 'POSITIVE' or 'NEGATIVE', 'score': confidence}`.

7. Sample Prompt + Expected Output

Prompt: "The product quality is amazing and I love using it."

Output: `{'label': 'POSITIVE', 'score': 0.998}`

Prompt: "This is the worst purchase I've ever made."

Output: `{'label': 'NEGATIVE', 'score': 0.997}`

8. Why this Project fits Unit 1?

It fits Unit 1 because it applies Hugging Face pipelines for a classification task, demonstrates NLP preprocessing, transformer usage, and direct application of pre-trained models.

9. Limitations

- Model may misinterpret sarcasm.
- Short reviews may lack context.
- Domain-specific slang may reduce accuracy.
- Sentiment classification is binary and cannot detect mixed emotions.

10. Planned Final Deliverable

A simple app or script that:

- Accepts a text review as input
- Runs a sentiment analysis pipeline
- Outputs Positive/Negative sentiment with score
- Displays aggregated insights if multiple reviews are analyzed

Code and Output:

```
from transformers import pipeline
```

```
# Load sentiment analysis model
```

```
sentiment_model = pipeline("sentiment-analysis")
```

```
def analyze_review(review_text):
```

```
    """
```

```
    Takes a single review string and returns sentiment result.
```

```
    """
```

```
    result = sentiment_model(review_text)[0]
```

```
    label = result['label']
```

```
    score = round(result['score'], 4)
```

```
    return f"Sentiment: {label} (Confidence: {score})"
```

```

def analyze_multiple_reviews(review_list):
    """
    Takes a list of reviews and returns sentiment for each one.
    """
    results = sentiment_model(review_list)
    analyzed = []

    for review, result in zip(review_list, results):
        label = result['label']
        score = round(result['score'], 4)
        analyzed.append({
            "review": review,
            "sentiment": label,
            "confidence": score
        })

    return analyzed

# -----
# Example usage
# -----

if __name__ == "__main__":

    # Single review
    review = "The product quality is amazing and exceeded my expectations!"

```

```

print(analyze_review(review))

# Multiple reviews
reviews = [
    "I hated the product. Completely useless.",
    "Works really well, I love it!",
    "It's okay, nothing special.",
    "Terrible build quality. Not worth the price."
]

```

```

results = analyze_multiple_reviews(reviews)

```

```

print("\n--- Multiple Review Analysis ---")

```

```

for res in results:

```

```

    print(f"\nReview: {res['review']}")

```

```

    print(f"Sentiment: {res['sentiment']} (Confidence: {res['confidence']})")

```

```

PES2UG23CS382>python customer_feedback_analyser_pes2ug23cs382.py
No model was supplied, defaulted to distilbert/distilbert-base-uncased-finetuned-sst-2-english and revision 714eb0f (https://huggingface.co/distilbert/distilbert-base-uncased-finetuned-sst-2-english).
Using a pipeline without specifying a model name and revision in production is not recommended.
Device set to use cpu
Sentiment: POSITIVE (Confidence: 0.9999)

--- Multiple Review Analysis ---

Review: I hated the product. Completely useless.
Sentiment: NEGATIVE (Confidence: 0.9998)

Review: Works really well, I love it!
Sentiment: POSITIVE (Confidence: 0.9999)

Review: It's okay, nothing special.
Sentiment: NEGATIVE (Confidence: 0.819)

Review: Terrible build quality. Not worth the price.
Sentiment: NEGATIVE (Confidence: 0.9998)

PES2UG23CS382>

```