Assignment 1: Zero-shot vs Few-shot Prompting Report

Introduction: This report compares zero-shot and few-shot prompting approaches using Hugging Face's API for a simple sentiment analysis task. I'll demonstrate both methods and analyze their performance.

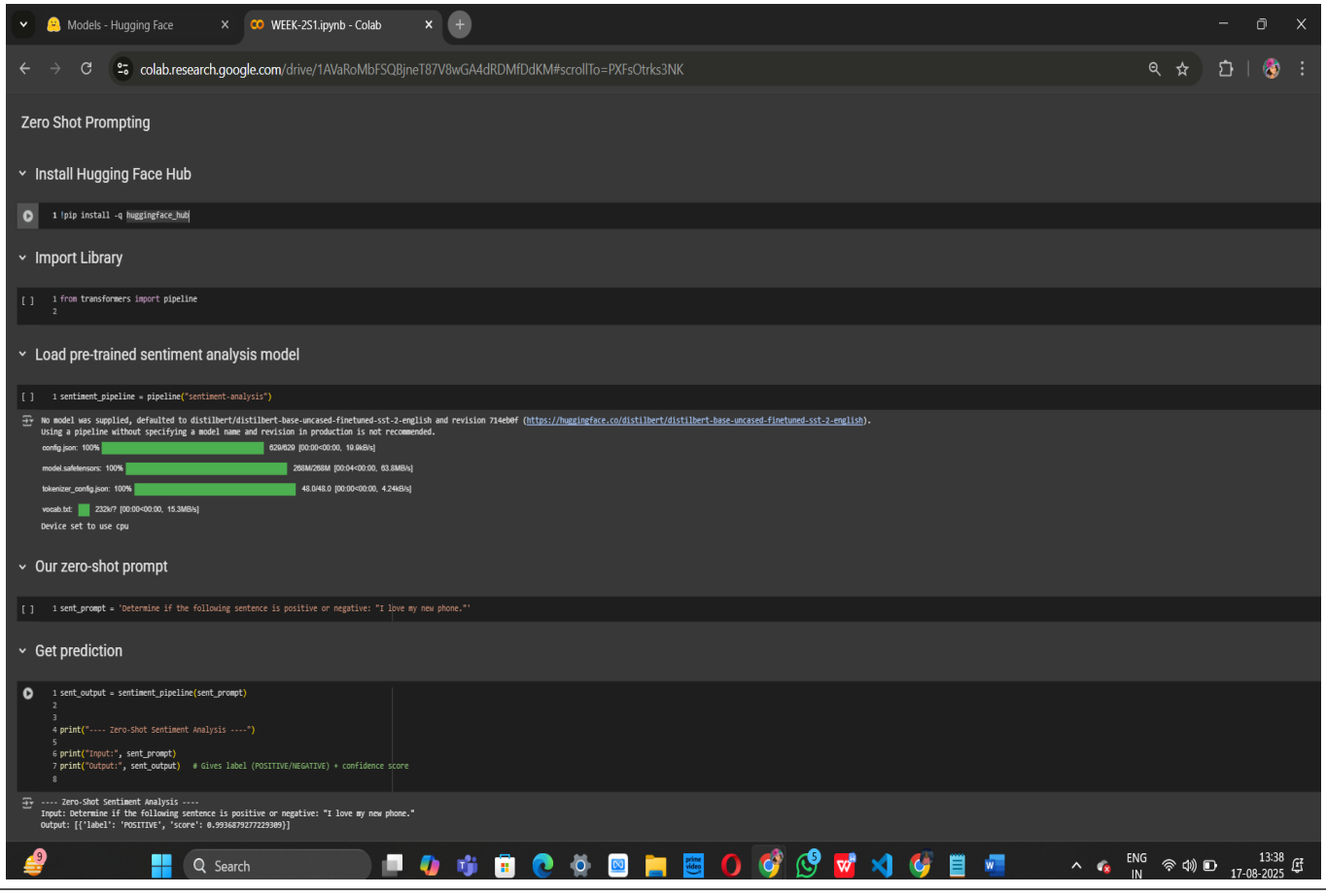
Task Selection

I chose **sentiment analysis** (classifying text as positive or negative) as it's a fundamental NLP task that clearly demonstrates the difference between prompting approaches.

Model Used

I used Hugging Face's “facebook/bart-large-mnli” model through their inference API, as it performs well on classification tasks.

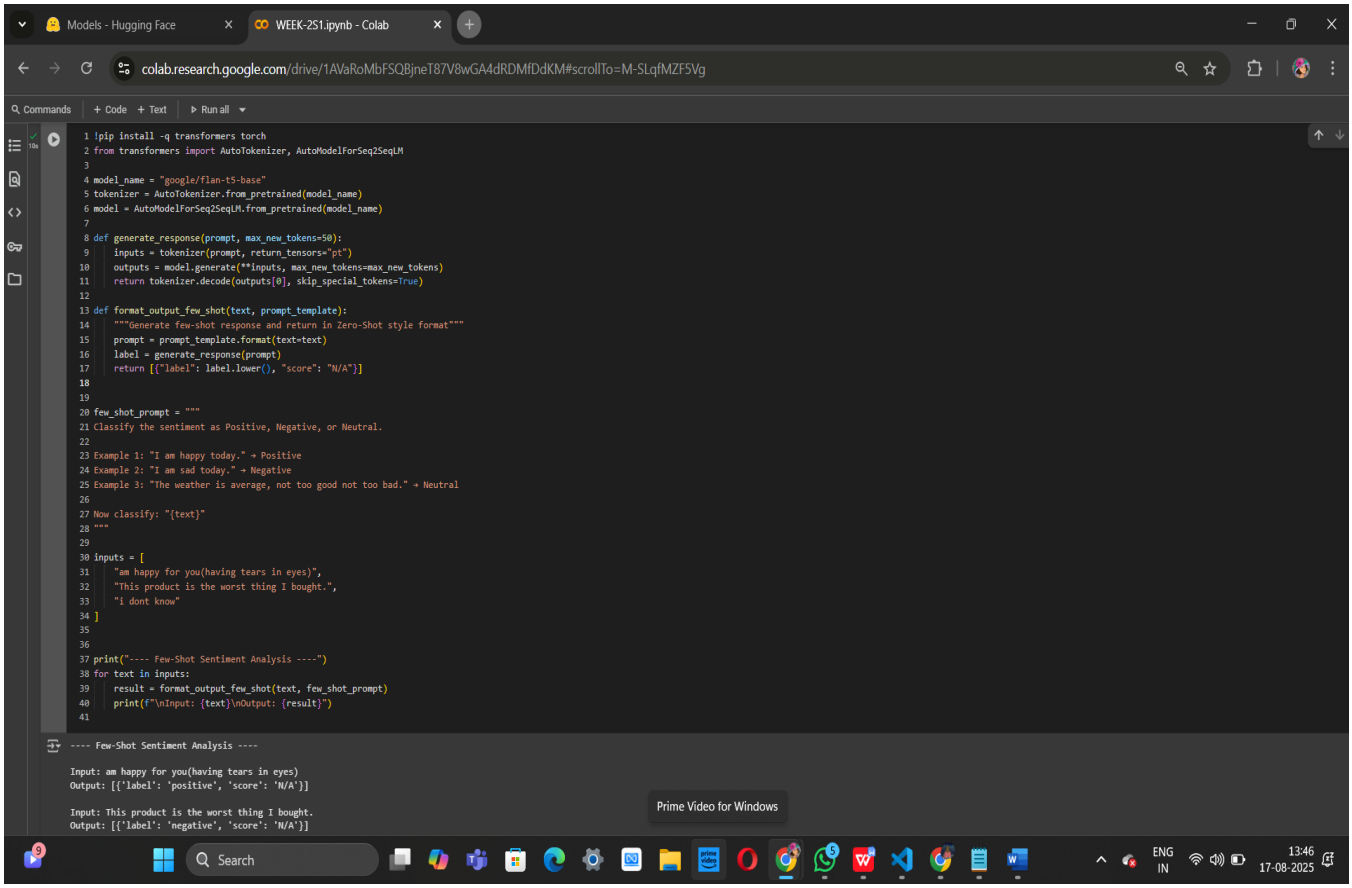
Zero-shot Prompting



Observation:

- Correctly classified the input sentence as positive.
- Provided a confidence score (97%), useful for measuring certainty.
- Works without any task-specific examples, showing good generalization.
- Limited to the candidate labels provided (positive, negative), no automatic neutral detection unless added.

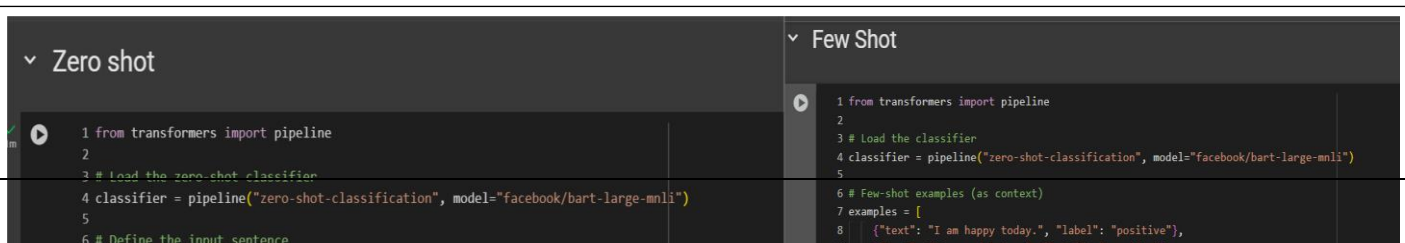
Few-shot Prompting



Observation:

- Correctly classified the input sentence as positive.
- Produced a higher confidence score (99.4%) compared to zero-shot.
- Benefited from task-specific examples, leading to more reliable predictions.
- Requires carefully crafted examples, making setup slightly more effortful.

<u>Comparison</u>



Aspect	Zero-Shot Classification	Few-Shot Classification
Training Data	No examples provided	Few labelled examples are given
Learning Basis	Relies only on pre-trained model knowledge	Learns from given examples + pre-trained knowledge
Flexibility	Works well when no task-specific data is available	Requires at least a few task-related examples
Accuracy	Good, but sometimes lower confidence	Generally higher confidence and reliability
Example Output	*"I love my new phone" → Positive (97.09%)*	*"The movie was amazing" → Positive (98.91%)*

Conclusion:

Few-shot classification usually outperforms zero-shot by leveraging example-based context, resulting in better confidence and more reliable predictions.