Zero-shot vs Few-shot Prompting

1. Objective

The goal of this project is to understand the difference between **zero-shot** and **few-shot prompting** using large language models (LLMs). Specifically, we focus on **sentiment analysis** of sentences.

2. Instructions & Implementation

Step 1: Select a Task

The task chosen is **sentiment analysis**, i.e., classifying a sentence as **positive** or **negative**.

Step 2: Zero-shot Prompting

Definition: In zero-shot prompting, the model is given the task **directly without examples**.

Prompt Example:

```csharp
Determine if the following sentence is positive or negative:
"I love my new phone."
```

Implementation (Hugging Face Model):

- Model: valhalla/distilbart-mnli-12-1
- Approach: zero-shot-classification
- Output Example:

```makefile
Prediction: Positive
Confidence: 0.98
```

Step 3: Few-shot Prompting

Definition: In few-shot prompting, the model is given **2–3 examples before the query** to guide it.

Prompt Example:

```vbnet
Decide whether the sentiment of the following sentence is Positive or Negative.
Give short justification.

Example 1:
Sentence: I love this movie, it was amazing!
Answer: Positive - expresses enjoyment.

Example 2:
Sentence: This food tastes terrible and I hate it.
Answer: Negative - expresses dislike.

Sentence: The movie was amazing.
Answer:
```
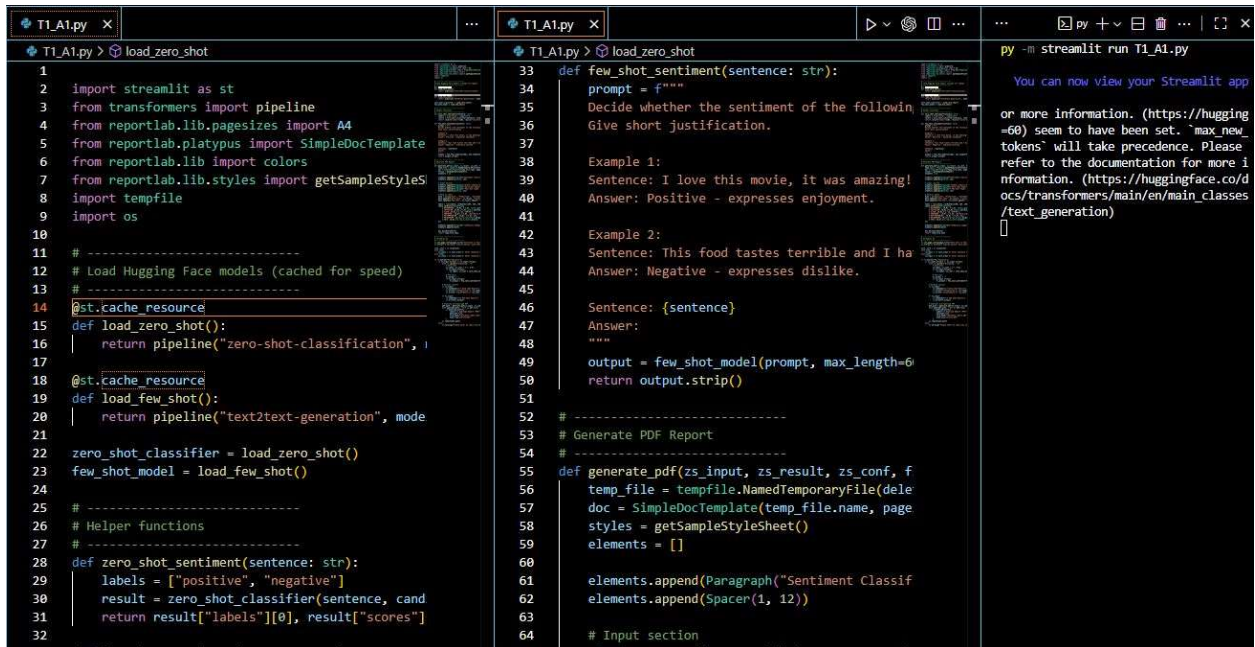
Step 4: Compare Outputs

Approach	Input Sentence	Prediction	Confidence / Reasoning
Zero-shot	I love my new phone.	Positive	0.98
Few-shot	I love my new phone.	Positive	Positive - expresses enjoyment

3. Observations

- Both zero-shot and few-shot prompting correctly classified the sentiment.
- Few-shot prompting provides a **short reasoning**, which improves interpretability.
- Zero-shot is faster and simpler but may lack detailed explanation.
- Few-shot is more reliable for subtle or ambiguous inputs because it **guides the model with examples**.

4. Deliverables

- Streamlit App: Interactive interface to enter sentences and run both approaches.

Fig1: Input Snapshot

- PDF Report: Automatically generated with:
  - User inputs
  - Zero-shot and few-shot results
  - Comparison table

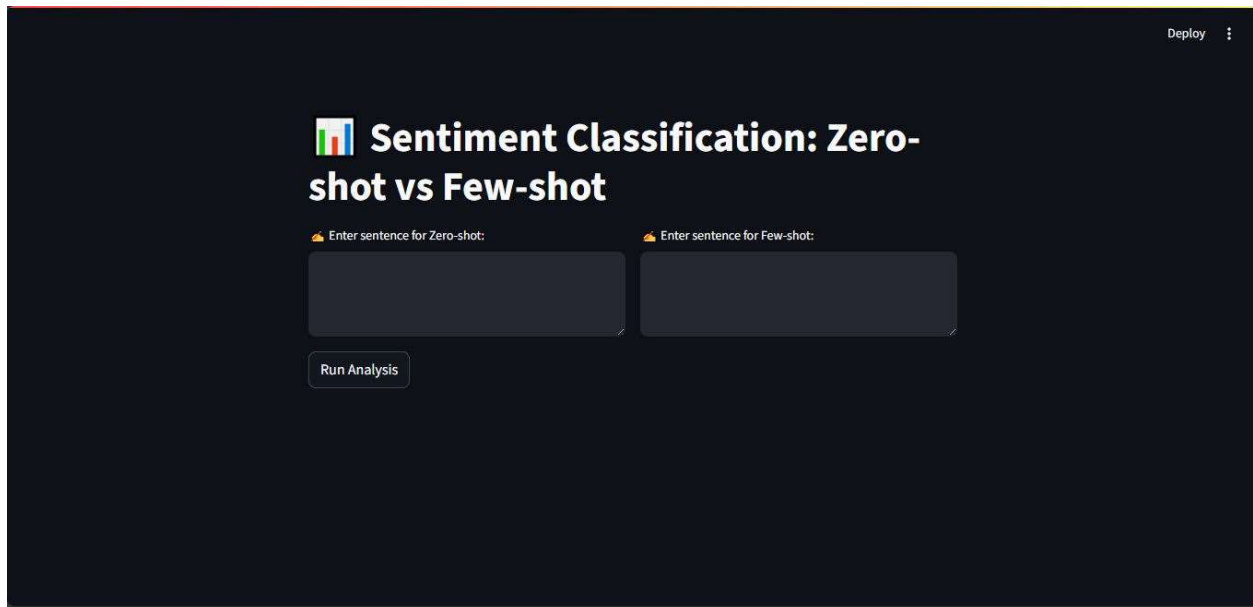Observations: Differences in reasoning and confidence between zero-shot and few-shot prompting.

5. Output

Fig2: Output Snapshot1

Fig3: Output Snapshot2