

# Purpose

The AI Customer Reviews Insights application converts unstructured raw customer reviews into structured insights (positives, negatives, problems, and solutions). The goal is to help businesses quickly understand customer sentiment and make actionable decisions.

## Workflow Explanation

- **Review Input:** Users can enter a single review via the Streamlit interface or upload a CSV file containing multiple reviews.
- **Preprocessing:** Cleaning of Raw text to delete irrelevant words and characters.
- **AI/NLP Processing:** Each review is analyzed using Gemini Flash-2.5 model.
- **Extracts four categories:** Positive, Negative, Problems, Solutions.
- **Structured Output:** Results are saved into a Pandas DataFrame.
- **Export:** Easy to export (CSV) for business reporting.
- **Visualization:** Users can click a button in the app to generate visualizations:

## Actionability

- Businesses can track top problems (e.g., “slow checkout”).
- See which features customers love (e.g., “fast delivery”).
- Prioritize solutions that customers themselves suggest.

# Test Cases

Here are some simple test cases you (or reviewers) can use to validate the application:

## 1. Positive Review with Suggestions

### Input Review:

I love the discounts, but the search is terrible and shows irrelevant results. Please add better filters.  
Rating:3

### Expected Output:

- **Positive:** ["discounts"]
- **Negative:** ["search is terrible", "irrelevant results"]
- **Problems:** ["bad search functionality"]
- **Solutions:** ["add better filters"]

### Application Output:



### Extracted Insights

```
{
  "positive": [
    0 : "discounts"
  ]
  "negative": [
    0 : "terrible search"
    1 : "irrelevant search results"
  ]
  "problems": [
    0 : "search functionality is poor"
    1 : "irrelevant search results are shown"
  ]
  "solutions": [
    0 : "add better filters"
    1 : "improve search filters"
  ]
}
```

## 2. Fully Positive Review

### Input Review:

Great service and fast delivery, I am very satisfied.  
Rating:5

### Expected Output:

- **Positive:** ["great service", "fast delivery"]
- **Negative:** []
- **Problems:** []
- **Solutions:** []

### Application Output:

#### Extracted Insights

```
{
  "positive": [
    0: "good service"
    1: "fast delivery"
    2: "customer satisfaction"
  ]
  "negative": []
  "problems": []
  "solutions": []
}
```

## 3. Fully Negative Review

### Input Review:

The checkout process is slow and the payment system crashes often.  
Rating:1

### Expected Output:

- **Positive:** []
- **Negative:** ["checkout is slow", "payment system crashes"]
- **Problems:** ["slow checkout", "unstable payment system"]
- **Solutions:** ["optimize checkout speed", "fix payment system crashes"]

#### Application Output:



### Extracted Insights

```
{
  "positive": [],
  "negative": [
    0: "slow checkout process",
    1: "frequent payment system crashes"
  ],
  "problems": [
    0: "checkout process speed",
    1: "payment system stability"
  ],
  "solutions": [
    0: "optimize checkout process speed",
    1: "improve payment system reliability"
  ]
}
```

## 4. Mixed Feedback

#### Input Review:

The app design looks great but keeps logging me out randomly.  
Rating:4

#### Expected Output:

- **Positive:** ["app design looks great"]
- **Negative:** ["keeps logging out randomly"]
- **Problems:** ["unstable session management"]
- **Solutions:** ["fix auto-logout issue"]

## Application Output:



## Extracted Insights

```
▼ {  
  ▼ "positive" : [  
    0 : "app design looks great"  
  ]  
  ▼ "negative" : [  
    0 : "random logouts"  
  ]  
  ▼ "problems" : [  
    0 : "random logouts"  
    1 : "unstable session management"  
  ]  
  ▼ "solutions" : [  
    0 : "improve session stability"  
    1 : "address random logouts"  
  ]  
}
```

## 5. Empty or Nonsense Input

### Input Review:

Asdfghjkl

Rating: 3

### Expected Output:

- Positive: []
- Negative: []
- Problems: []
- Solutions: []

## Application Output:



## Extracted Insights

```
▼ {  
  ▶ "positive" : []  
  ▶ "negative" : []  
  ▶ "problems" : []  
  ▶ "solutions" : []  
}
```