# Requirements Gathering: Sentiment Analysis with Streamlit

Project: Deployed Product Review Sentiment Analysis Application

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### 1. Stakeholder Analysis



| **Stakeholder Role** | **Description** | **Key Interest / Need** |
| --- | --- | --- |
| **End User** | A member of the public or a project evaluator interacting with the live Streamlit application. | An easy-to-use interface to quickly find out the sentiment of a piece of text. |
| **Development Team** | The four team members responsible for building and deploying the project. | Clear, unambiguous requirements to ensure all components integrate correctly. |
| **Project Evaluator** | The instructor or judge assessing the project's quality, functionality, and documentation. | A fully functional, deployed application that meets all project objectives and is well-documented. |
| **(Hypothetical) Business Analyst** | A stakeholder who would use the tool to understand customer feedback at scale. | An accurate and reliable tool to gauge customer opinion and identify trends in feedback. |

### 2. User Stories & Use Cases

These stories define the system's functionality from a user's perspective.

* **User** Story **1 (Data Collection Specialist):** "As the Data Collector, I need to write a script that can scrape product reviews from a website so that I can create a custom dataset for our model."
* **User Story 2 (Data Pipeline Engineer):** "As the Pipeline Engineer, I need to build a function that takes raw text and applies all necessary cleaning steps (lowercasing, removing punctuation, etc.) so that the data is ready for the model."
* **User Story 3 (ML/DL Specialist):** "As the ML Specialist, I need to fine-tune a BERT model on our custom dataset so that it can accurately classify the sentiment of reviews."
* **User Story 4 (Streamlit Developer):** "As the Streamlit Developer, I need to create a web page with a text box and a button so that a user can input a review and submit it for analysis."
* **User** Story 5 **(End User):** "As a user, I want to paste a product review into the app and click 'Analyze' so that I can see if the sentiment is positive, neutral, or negative."
* **User Story 6 (Project Evaluator):** "As an evaluator, I need to access the live, deployed Streamlit application via a public URL so that I can test its functionality and performance."

### 3. Functional Requirements (FRs)

These are the specific actions the system **must** perform.

| **ID** | **Requirement Description** | **Priority** |
| --- | --- | --- |
| **FR-1** | The system **must** provide a script to scrape product reviews to form a dataset. | High |
| **FR-2** | The data pipeline **must** clean raw text by lowercasing, removing punctuation, and handling special characters. | High |
| **FR-3** | The data pipeline **must** tokenize and process the text into a format suitable for a BERT model. | High |
| **FR-4** | The system **must** train a sentiment classification model based on the processed data. | High |
| **FR-5** | The trained model **must** be saved as an artifact that can be loaded into the Streamlit application. | High |
| **FR-6** | The Streamlit application **must** feature a user interface with a text area for input and a button to trigger the sentiment analysis process. | High |
| **FR-7** | Upon analysis, the application **must** display the predicted sentiment (e.g., "Positive", "Neutral", "Negative"). | High |
| **FR-8** | The application **must** also display a confidence score or probability for the prediction. | Medium |
| **FR-9** | The final application **must** be publicly deployed and accessible via a URL from Streamlit Community Cloud. | High |

### 4. Non-Functional Requirements (NFRs)

These requirements define the quality, performance, and operational standards.

| **Category** | **ID** | **Requirement Description** |
| --- | --- | --- |
| **Performance** | NFR-1 | The sentiment prediction for a typical review (50-100 words) should be displayed in under 3 seconds. |
| **Usability** | NFR-2 | The user interface must be clean, intuitive, and require no special instructions to use. |
| **Reliability** | NFR-3 | The deployed Streamlit application must maintain 99% uptime during the evaluation period. |
| **Deployability** | NFR-4 | The project's GitHub repository must contain a requirements.txt file with all necessary dependencies for a one-click deployment on Streamlit Cloud. |

### 5. Data Requirements

The primary data structure to be used across the project.

| **Field Name** | **Data Type** | **Example** | **Nulls Allowed?** | **Description** |
| --- | --- | --- | --- | --- |
| review\_text | String | "This product is amazing! I love it." | No | The raw text content of the product review. |
| rating | Integer | 5 | No | The star rating |