statement.md

📌 Problem Statement

Spam messages are increasing across messaging platforms, leading to privacy issues, fraudulent activities, and user inconvenience. Manual identification of spam is inefficient and unreliable. This project aims to develop an intelligent system that automatically analyzes a user-entered message and classifies it as Spam or Not Spam using Machine Learning techniques, paired with a simple and accessible Tkinter GUI.

📌 Scope of the Project

- The system focuses on text-based spam detection for short messages (SMS-style input).
- Uses a trained Naive Bayes Machine Learning model for classification.
- Provides a user-friendly desktop GUI built with Tkinter.
- Handles basic text preprocessing and message classification.
- Suitable for academic learning, demonstrations, and small-scale usage.
- Does not include storage, networking, or large datasets—designed to be lightweight for first-year AI & ML students.

📌 Target Users

- Students learning Machine Learning and Python GUI development
- Beginners who want to understand spam detection
- Educators demonstrating ML concepts in class
- Users who want a simple tool to check if a message looks suspicious
- Developers starting with NLP-based classification projects

📌 High-Level Features

- ✔ Spam Detection Using Machine Learning
Classifies any message as Spam or Ham using a trained Naive Bayes model.
- ✔ User-Friendly Tkinter GUI
Allows easy interaction without command-line usage.
- ✔ Real-Time Classification
Instant result pop-up upon clicking Detect Spam.
- ✔ Text Preprocessing
Includes cleaning, lowercasing, and token processing before classification.
- ✔ TF-IDF Vectorization
Converts text into meaningful numerical features for the ML model.
- ✔ Clear Input Option
Resets the text field to allow testing multiple messages.