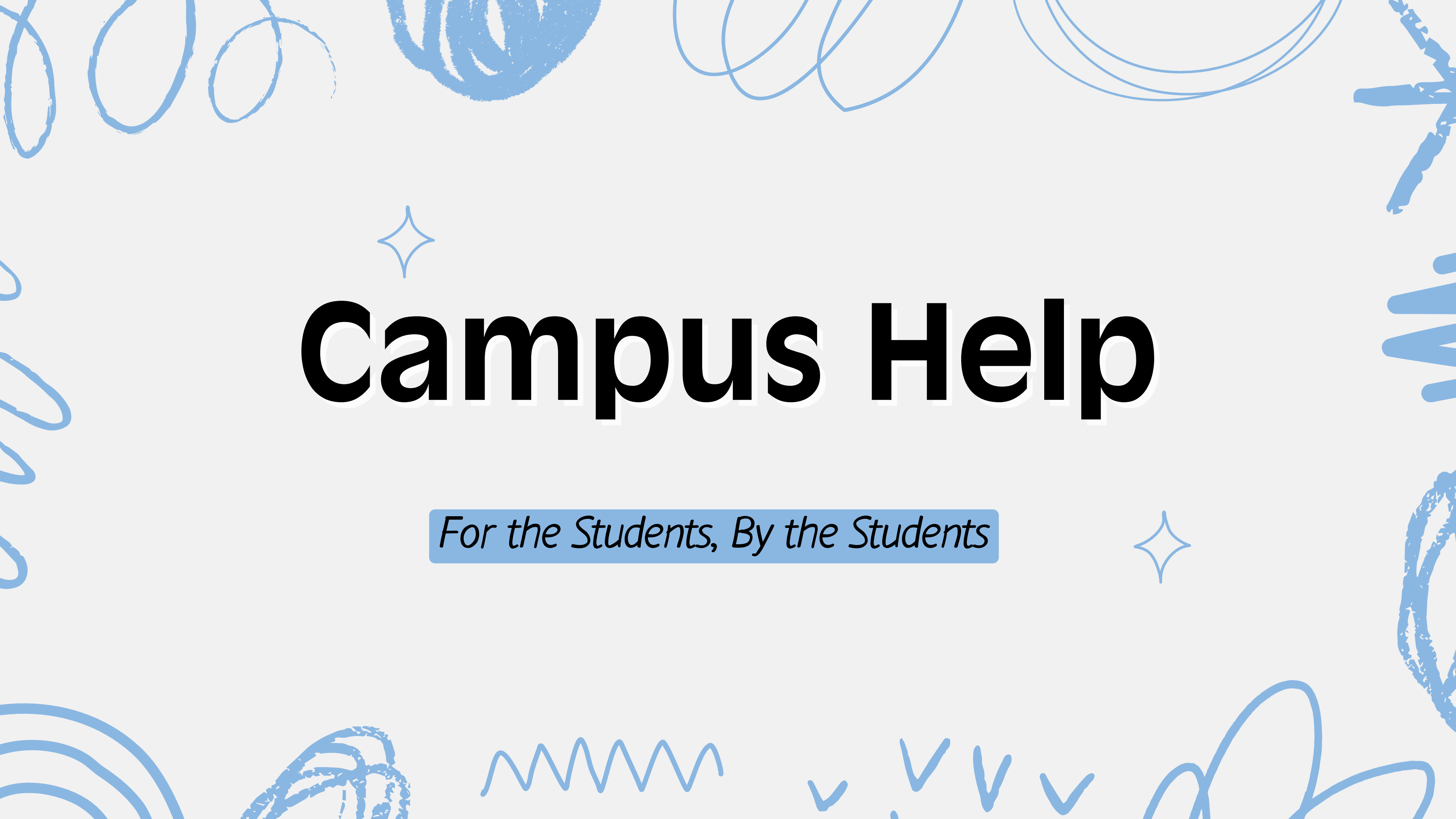


Problem Statement

- *Digital Lost & Found System: Implement a location-based digital portal where students can report and track lost or found items, fostering a more connected and responsible campus environment.*
- *AI-Powered Canteen & Mess Management: Use AI to predict food demand.*





Campus Help

For the Students, By the Students



Proposed Solution





1. *We've built an image-based lost-and-found model where users uploads a photo of the lost item and with help of YOLO and vector embeddings, similar frames are found in a cctv recording.*

2. *We've built a description-based system that matches lost and found items by comparing their textual descriptions using sentence similarity.*

3. *We've developed a Random Forest-based daily people prediction model to optimize meal preparation and minimize food wastage.*

4. *We've developed a online student portal using NodeJs backend + React frontend for students featuring secure authentication, password management, and login system.*



IMPLEMENTATION

DIGITAL LOST & FOUND SYSTEM



OBJECT DETECTION

YOLO - v8n

The project utilizes the YOLO (You Only Look Once) v8n model, a state-of-the-art object detection framework provided by the Ultralytics library.

YOLO v8n is applied to each frame to detect objects. The model outputs bounding boxes (bbox), confidence scores, and other metadata for detected objects.

Bounding Box Cropping: Detected objects are cropped from the frame using the bounding box coordinates (x1, y1, x2, y2).

VECTOR EMBEDDINGS + COSINE SIMILARITY SEARCH

CLIP VECTOR EMBEDDINGS

*The **CLIP model (ViT-B-32)** is loaded using the `open_clip` library with weights pretrained on the LAION dataset. The model operates on **GPU (cuda)** if available.*

*Each preprocessed image is passed through **CLIP's image encoder** (`clip_model.encode_image`) to generate a high-dimensional feature vector (embedding). These embeddings are normalized to unit length for **cosine similarity calculations**.*

IMPLEMENTATION

DIGITAL LOST & FOUND - CONTD.

DEMAND PREDICTION MODEL

SentenceTransformer
(sentence-transformers library)

Model Used: all-MiniLM-L6-v2

Model used:- Random Forest classifier



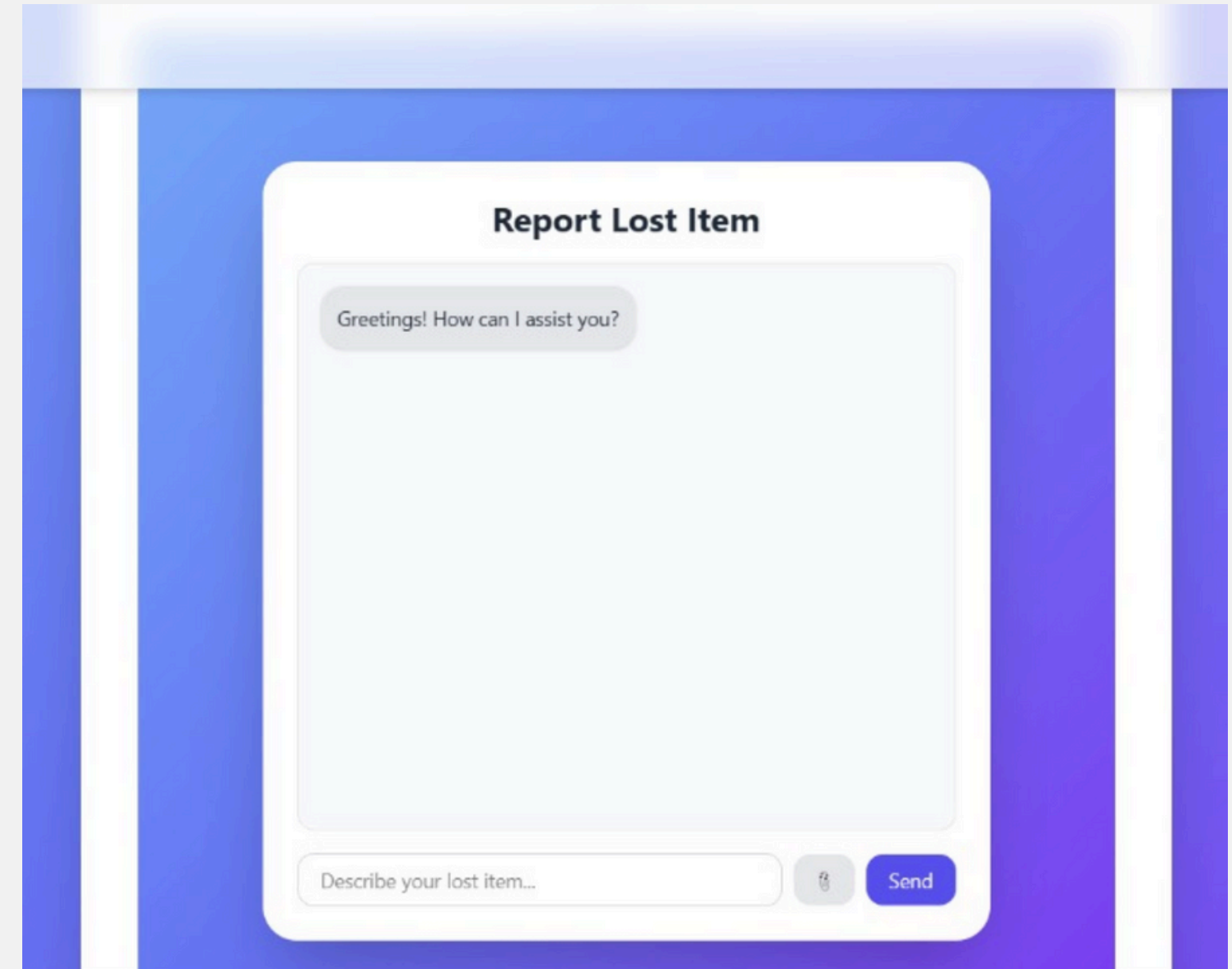
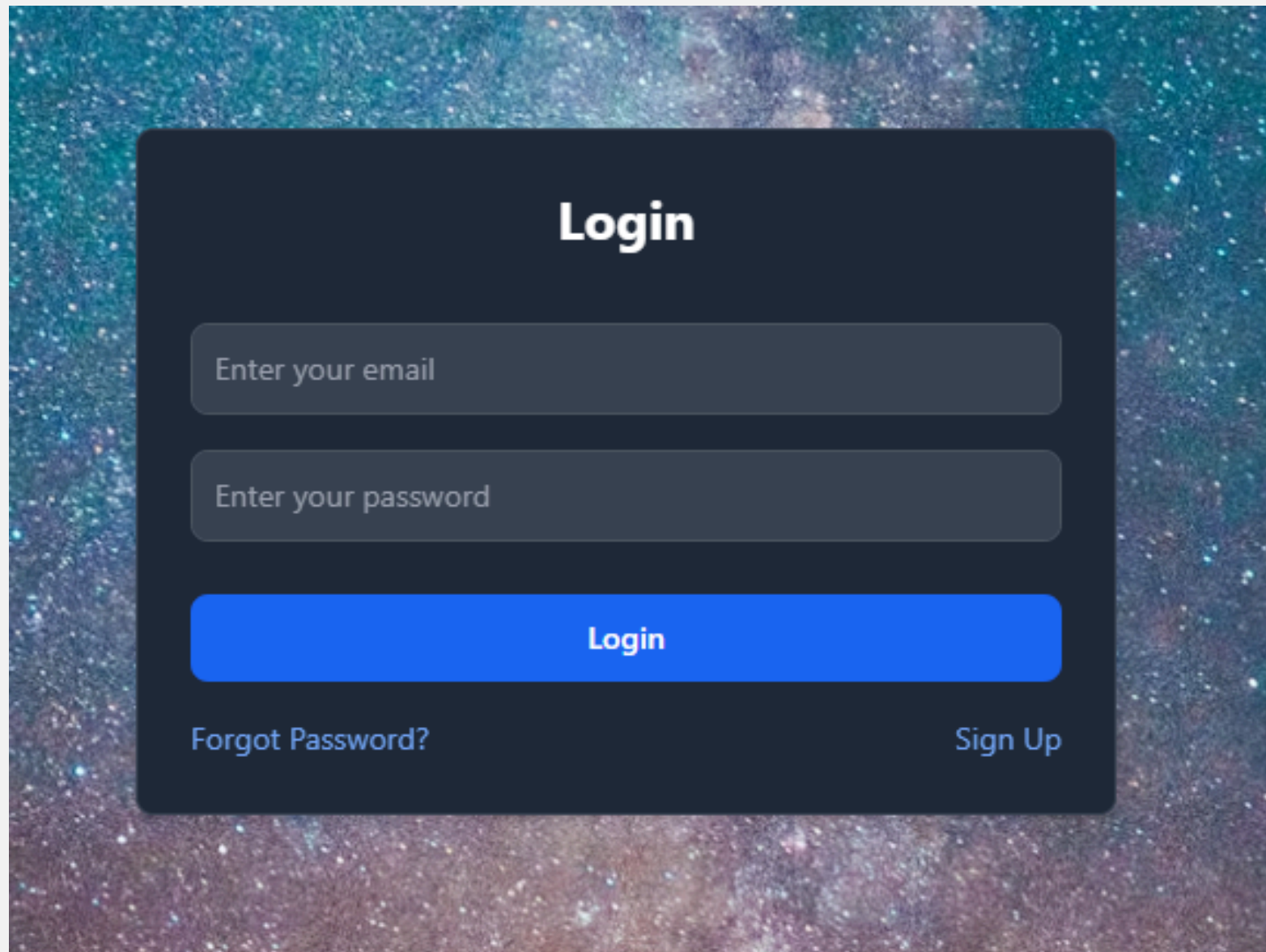
WHY?

- *Efficient & Fast*
- *Trained using **contrastive learning techniques**, allowing it to understand sentence meaning beyond surface-level word matching.*
- *Balances speed and accuracy*

- *Developed a demand prediction model for a college mess by constructing a feature-rich dataset with key attributes such as date, time, day, menu items, and events.*
- *Applied feature engineering techniques including one-hot encoding and enhancements.*

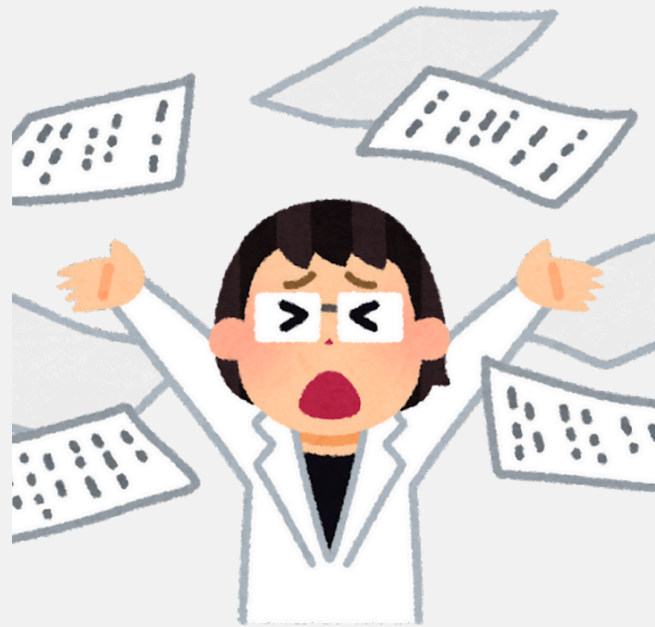
IMPLEMENTATION

BACKEND + FRONTEND



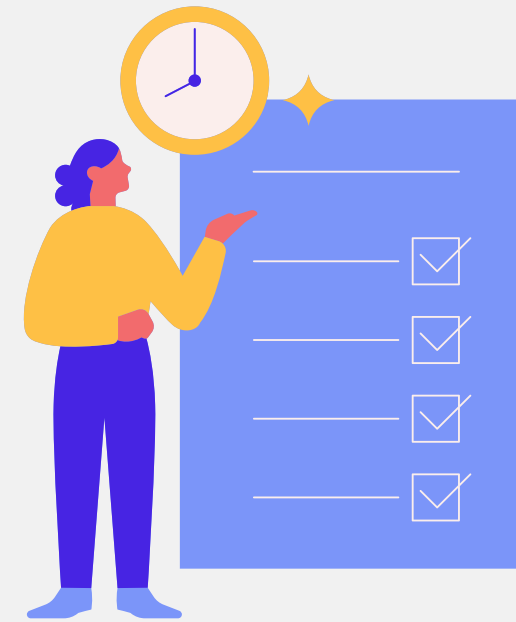
NodeJs + ReactJs + MongoDB

Impact



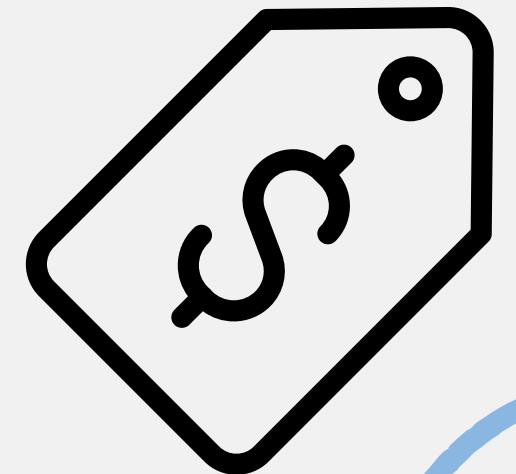
**Reduced Stress
and Anxiety**

**Improved
Campus Safety
and Trust**



**Time and Resource
Efficiency**

**Enhanced
Sustainability and
Cost-Saving**



The background is a light gray color, decorated with various hand-drawn blue doodles. These include several overlapping circles and ovals at the top, a series of concentric arcs at the bottom left, a wavy line at the bottom center, and several checkmarks at the bottom right. On the far right edge, there are some abstract, star-like shapes.

TEAM BLITZ