VISUAL PRODUCT MATCHER

My approach for building the **Visual Product Matcher** was to combine a deep-learning image embedding model with a simple, responsive web interface.

On the **backend**, I used **Flask** and the **SentenceTransformer CLIP model (clip-ViT-L-14)** to convert both product images and the uploaded image into numerical embeddings. These embeddings were compared using **cosine similarity** to find visually similar products. To improve performance, I cached all product embeddings locally in a pickle file so that the model doesn't need to recompute them every time.

The **frontend** was built with **React and Tailwind CSS** to provide a clean, mobile-friendly UI. Users can either upload an image or enter an image URL, preview it, and view a list of similar products with similarity scores and a filter slider.

I implemented **error handling**, **loading states**, and **filtering** for a better user experience. The application is modular, easy to deploy, and can be scaled or improved by adding FAISS-based indexing or fine-tuning for domain-specific accuracy.

This project demonstrates an end-to-end solution for **visual similarity search** using open-source tools and minimal infrastructure.