# 💊 PharmaLens — AI-powered Prescription Summarizer & Interaction Checker

## 🚀 Project Overview

PharmaLens is a professional-grade full-stack application designed to help patients and healthcare professionals quickly parse, understand, and validate medical prescriptions. It uses lightweight AI/NLP techniques to generate clear summaries and check for potential drug interactions, maintaining a secure history of all prescriptions in a MySQL database.

## 🏗️ Tech Stack

- Backend: Spring Boot (Java) — provides REST APIs, handles business logic, connects to MySQL, and integrates with a simple AI/NLP service.  
- Frontend: React or Next.js — clean interface to enter prescriptions, view AI summaries, interaction warnings, and historical records.  
- Database: MySQL — stores prescription records, summaries, and any flagged interactions.  
- AI/NLP Component: Small Python microservice (or embedded Java logic) that parses prescription text to extract drugs, dosages, and checks for known interaction rules.

## 🔍 Key Features

- Smart Parsing: Enter prescription text (manually or pasted), automatically parsed to extract key medications and instructions.  
- Clear Summaries: Generates patient-friendly summaries of when and how to take each medication.  
- Interaction Checks: Flags common or critical drug interaction risks using a rule-based system.  
- Historical Dashboard: Stores all prescriptions and AI analyses in MySQL for future reference.

## 🗄️ Example Database Schema

prescriptions  
- id INT AUTO\_INCREMENT  
- patient\_id INT (optional for multi-user)  
- original\_text TEXT  
- ai\_summary TEXT  
- warnings TEXT  
- created\_at TIMESTAMP DEFAULT CURRENT\_TIMESTAMP

## 🌟 Why PharmaLens?

- Professional branding with a clear focus on improving prescription safety and clarity.  
- Demonstrates expertise in Spring Boot, React (or Next.js), MySQL, and integrating AI/NLP in a practical health tech application.  
- Easily extendable to advanced ML or integration with real medical databases in the future.

## 📝 Dummy Data Approach

PharmaLens will use dummy prescription texts and a small set of hardcoded interaction rules, ensuring quick development without the need for sensitive real-world data.

## ✅ Quick Example

Input Prescription: Take Amoxicillin 500mg twice daily. Ibuprofen as needed.  
AI Summary: Take Amoxicillin twice daily after food. Use Ibuprofen only if pain increases.  
Warnings: Long-term Ibuprofen use may irritate stomach lining.

## 🚀 Future Enhancements

- Integrate a medical ontology (like UMLS or DrugBank APIs) for richer interaction checks.  
- Replace rule-based NLP with a trained ML model for better extraction.  
- Add authentication for multi-patient support.

## 📌 Project Name

PharmaLens — "Bringing clarity to prescriptions through an intelligent lens."

## ✅ Ready to Build

This document outlines the scope and design for PharmaLens, ensuring it can be built in a day as a functional MVP using Spring Boot, React, MySQL, and a simple AI component with dummy data.