## OVERVIEW

This system helps users (e.g., healthcare professionals) check for drug interactions in real time with condition-based severity adjustments. It provides:  
- Drug interaction alerts  
- Condition-aware severity levels  
- Clinical notes explaining flagged interactions  
- Suggested alternative drugs  
- Brand name and manufacturer details for Nigerian inclusivity  
- Symptom context for each condition

## DATABASE STRUCTURE

|  |  |
| --- | --- |
| Table Name | Purpose |
| Drug | Master list of drugs with names, classes, brands, and manufacturers |
| Interaction | Base interactions between two drugs with a general description |
| Condition | List of 10 predefined medical conditions |
| Condition\_Interaction | Adjusts interaction severity per condition (core to system’s uniqueness) |
| Symptom | List of symptoms tied to conditions |
| Condition\_Symptom\_Map | Links symptoms to their respective conditions |
| Clinical\_Note | Explanatory notes tied to each interaction |
| Alternative\_Drug | Alternatives for flagged drug combinations |

## FRONTEND FUNCTIONALITY

Here’s what the user interface should enable:  
  
1. User inputs two drugs (by either generic or brand name — both should return same results).  
2. System returns for both drugs their:  
 - Drug names  
 - Drug classes  
 - All available brand names  
 - Manufacturers  
 - Interaction type (e.g., Major 🟠) with color-coded severity flags  
 - Severity score (1–4)  
 - Clinical note (based on interaction)  
 - Suggested alternative drug(s) if interaction is high-risk  
3. Condition awareness:  
 - User can select a condition along with the drugs (e.g., Pregnancy, Liver Disease)  
 - System checks if the interaction severity should change based on the selected condition  
 - Adjusted severity is displayed with appropriate urgency alert  
4. Search by Brand or Generic Name:  
 - Searching for “Zestril” returns results tied to “Lisinopril”  
 - All brand/generic names are linked through the Drug table  
5. Condition Explorer:  
 - Users can explore a condition and view its key symptoms (from Symptom and Condition\_Symptom\_Map)

## BACKEND LOGIC

🔁 Drug Matching and Interaction Checking  
- When a user searches for two drugs:  
 - Match both drugs in the Drug table (accepting brand or generic input)  
 - Fetch any record in the Interaction table where both drugs match (interaction must be order-agnostic (A+B is same as B+A)  
 - Get the interaction type, description, severity, clinical note, and any linked alternative(s)

🧠 Adjust Severity Based on Condition  
- If a condition is selected:  
 • Check the Condition\_Interaction table for a match between the Interaction ID and Condition ID  
 • If found → use the adjusted severity and interaction type  
 • If not found → fall back to the default severity from the Interaction table  
 • If no condition is selected → always use the base severity

💊 Alternative Drug Logic  
- Alternatives should be shown only if severity (either condition-adjusted or base) is Major (3) or Contraindicated (4)  
- Fetch from the Alternative\_Drug table where Interaction\_ID matches  
- Look for either Replaced\_Drug\_ID = Drug A or Drug B  
- Return:  
 “Instead of Drug X, consider Drug Y.”  
- If severity is less than 3 → do not show alternatives  
- You don’t need to store alternatives per condition; just filter their display based on final severity

## 4. Drug Explorer & Severity Color Codes

The system includes a Drug Explorer that allows users to search by drug name or brand name, returning full details such as drug class, manufacturers, and potential interactions.  
  
Severity Score Color Coding for Visual Alerts:  
• 4 → 🔴 Contraindicated  
• 3 → 🟠 Major  
• 2 → 🟡 Moderate  
• 1 → 🟢 Minor

## 5. Alert Logic and Real-Time Interaction Flagging

This system features Real-Time Clinical Alerts, meaning it automatically checks and flags potential drug interactions as the user is selecting drugs, before form submission is completed.  
  
Interaction Alert Logic:  
• If no interaction is found → show “No known interaction”  
• If condition-adjusted interaction is Contraindicated (4) → alert appears in red and recommendation is blocked  
• If condition-adjusted or base interaction is Major (3) or Contraindicated (4) → system will suggest alternatives  
• All alerts are shown with color-coded severity flags  
  
Autocomplete functionality must be implemented for drug and condition input fields to improve speed and accuracy of selection.