**Design and Implementation of a**

**Condition-Aware Drug Interaction** **Checker with Real-Time Clinical Alerts**

**System Overview:**

This system is a web-based drug interaction checker designed to help pharmacists and users check for harmful combinations of drugs. It goes beyond traditional interaction checkers like Drugs.com by including two core extensions that make it smarter and more locally relevant.

**Core System Functionality (Base):**

• Users input two or more drugs.

• The system checks if any harmful interactions exist between the drugs.

• For each interaction, it shows:

• Severity (Major, Moderate, Minor)

• Detailed explanation of the risk

• Food or therapeutic duplication warnings if applicable

**Extension 1: Condition-Aware Interaction Warnings (Main Contribution)**

**What it does:**

Instead of giving generic interaction warnings, this feature checks if the patient has a particular condition (e.g.,

hypertension, malaria, asthma) and uses that context to upgrade or downgrade the severity of the drug interaction.

**How it works:**

• User or pharmacist selects the patient’s condition during the check.

• The system cross-checks:

• Drug A + Drug B → Regular interaction severity

• But if “Condition X” is present → Show adjusted severity

• Example: Drug A + Drug B = Moderate normally, but if patient has asthma → system marks it Major.

**Extension 2: Symptom-to-Condition Support (Supportive Feature)**

What it does:

Some users might not know their medical condition but can describe symptoms (e.g., dizziness, headache, weakness). This feature allows them to enter symptoms, which the system maps to possible conditions behind the scenes, then applies Extension 1.

How it works:

• User enters symptoms (e.g., dizziness).

• System maps dizziness → possible conditions (e.g., hypertension, vertigo).

• System uses that condition info to enhance the interaction alert.

**Features**

Real time interaction alert when users browse medications:

• Color-coded flags for severity (e.g., red = major).

• Safer drug alternatives suggested when dangerous combinations are detected.

• Locally relevant drugs included where possible (e.g., common Nigerian brands).

**Technical Expectations**

• You’ll need to build:

• A clean frontend (basic input form + result display)

• Backend logic to handle:

• Drug interaction lookups

• Condition-aware severity adjustment

• Symptom-to-condition mapping

• Suggesting safer alternatives

**Database Tables to Include:**

1. Drugs

2. Drug\_Interactions

3. Conditions

4. Drug\_Condition\_Link

5. Symptoms

6. Symptom\_Condition\_Map

7. Interaction\_Severity + (clinical note)

8. Alternatives

Goal:

To build an intelligent drug checker that doesn’t just “warn about interactions,” but also adjusts its warnings based on patient context, just like a real-life pharmacist would.