🚑 Features of Blood Donation Web Application (Detailed)

1️⃣ Donor Registration & Onboarding

- **What it does:** Allows people to sign up as blood donors.

- **How it works:**

    - Donor enters name, age, gender, blood group, contact, and location.

    - Verification with OTP/email.

    - Medical eligibility check (age > 18, last donation > 90 days).

- **Why important:** Builds a trusted pool of verified donors.

2️⃣ User Roles & Access

- **Types of users:**

    - **Donors** → Register and donate blood.

    - **Hospitals/NGOs** → Request blood from donors or blood banks.

    - **Blood Banks** → Manage inventory.

    - **Admins** → Monitor and control system usage.

- **Why important:** Provides clear separation of responsibilities and prevents misuse.

3️⃣ Search & Match System

- **What it does:** Lets patients/hospitals search for required blood.

- **How it works:**

    - Filter by blood group (A+, B–, O–, etc.).

    - Filter by city/location (nearest donors appear first).

    - Shows both **donors** and **blood bank inventory**.

- **Why important:** Saves time in emergencies by quickly finding the right match.

4️⃣ Request Broadcast (Emergency Alerts)

- **What it does:** Sends urgent blood requests to multiple nearby donors.

- **How it works:**

    - Hospital/NGO creates a request (e.g., "2 units O– needed at Apollo Hospital").

    - System notifies eligible donors via **app/SMS/WhatsApp/email**.

    - Donors accept → hospital gets confirmation.

- **Why important:** Helps in **critical emergencies** when time is short.

5️⃣ Blood Bank Inventory Management

- **What it does:** Lets blood banks manage their stock.

- **How it works:**

    - Add/update available units of blood groups.

    - Track expiry dates.

    - Auto-remove expired blood.

- **Why important:** Keeps **real-time visibility** of blood stock and prevents waste.

6️⃣ Reminders & Donor Cool-off Management

- **What it does:** Ensures donors rest before next donation.

- **How it works:**

    - After donation, donor marked **Unavailable** for 90 days.

    - System sends reminders when eligible again.

- **Why important:** Protects donor health and increases donation frequency safely.

7️⃣ Notifications & Alerts

- **Types:**

    - OTP verification.

    - Donation reminders.

    - Emergency requests.

    - Inventory updates for hospitals.

- **Why important:** Keeps all stakeholders updated in real time.

8️⃣ Privacy & Security

- **Features:**

    - Donor personal data protected.

    - Hospitals cannot misuse donor contacts.

    - Communication handled via system (not direct sharing unless donor accepts).

- **Why important:** Builds trust and ensures compliance with privacy rules.

🔎 Blood Requirement Search Flow

1️⃣ User Creates a Requirement

- The user could be:

    - A **hospital** (doctor, nurse, blood bank staff).

    - An **NGO** helping patients.

    - A **patient's family member**.

- They enter details like:

    - **Blood group** (e.g., O+, B–).

    - **Units required** (e.g., 2 units).

    - **Location** (city, hospital name, GPS).

    - **Urgency** (normal or emergency).

📌 Example: A hospital in Delhi needs **2 units of B+** immediately.

2️⃣ System Searches Donors & Blood Banks

- The system checks two sources in parallel:

    - **Donor Database** → Finds all eligible donors with the required blood group in the nearby location.

    - **Blood Bank Inventory** → Checks real-time stock availability (units and expiry dates).

- Search is powered by:

    - **Filters** → Blood group, city, radius (e.g., within 10 km).

    - **Ranking** → Closest verified donors appear first.

📌 Example: Search result → 5 eligible B+ donors within 5 km + 1 nearby blood bank with 3 units available.

3️⃣ Results Shown to the User

- The seeker sees a **list of matching donors/blood banks**.

- Details may include:

    - Donor first name (or anonymized ID for privacy).

    - Approximate location (not full address).

    - Contact option (system-controlled).

    - For blood banks → available units & expiry date.

📌 Example:

- Donor: Ravi, Male, 24, 3 km away → Eligible

- Blood Bank: Red Cross, 3 units B+, expires in 5 days.

4️⃣ Request & Confirmation

- The seeker can:

    - **Directly request a donor** → System sends notification.

    - **Reserve blood from a blood bank** → Slot/booking confirmed.

📌 Example: The hospital selects **2 donors** + reserves **1 unit from blood bank**.

5️⃣ Notifications

- Donors get notified (via app/SMS/WhatsApp) → "Hospital needs B+ near you."

- Donor can **Accept** or **Reject**.

- Once accepted → hospital is update