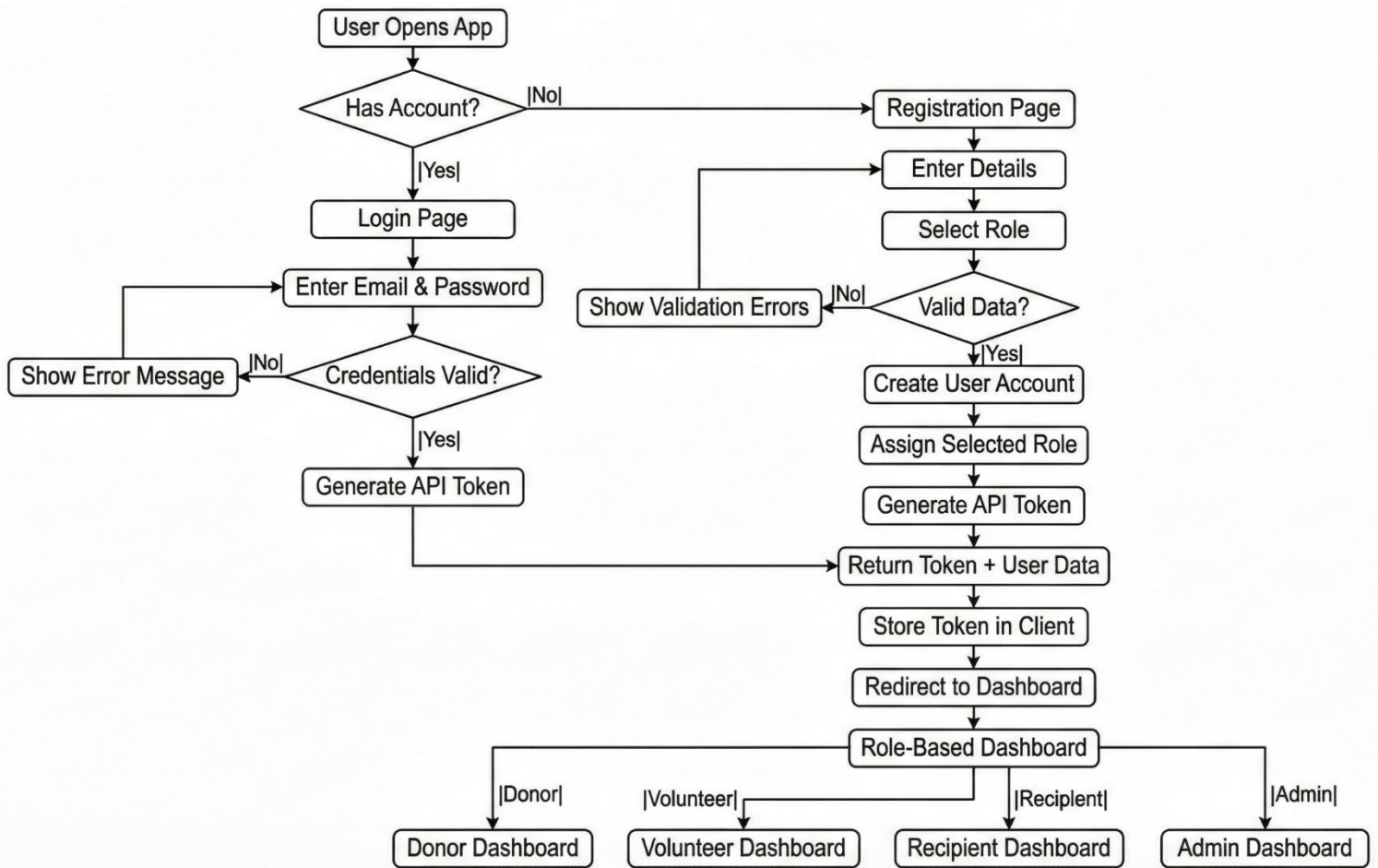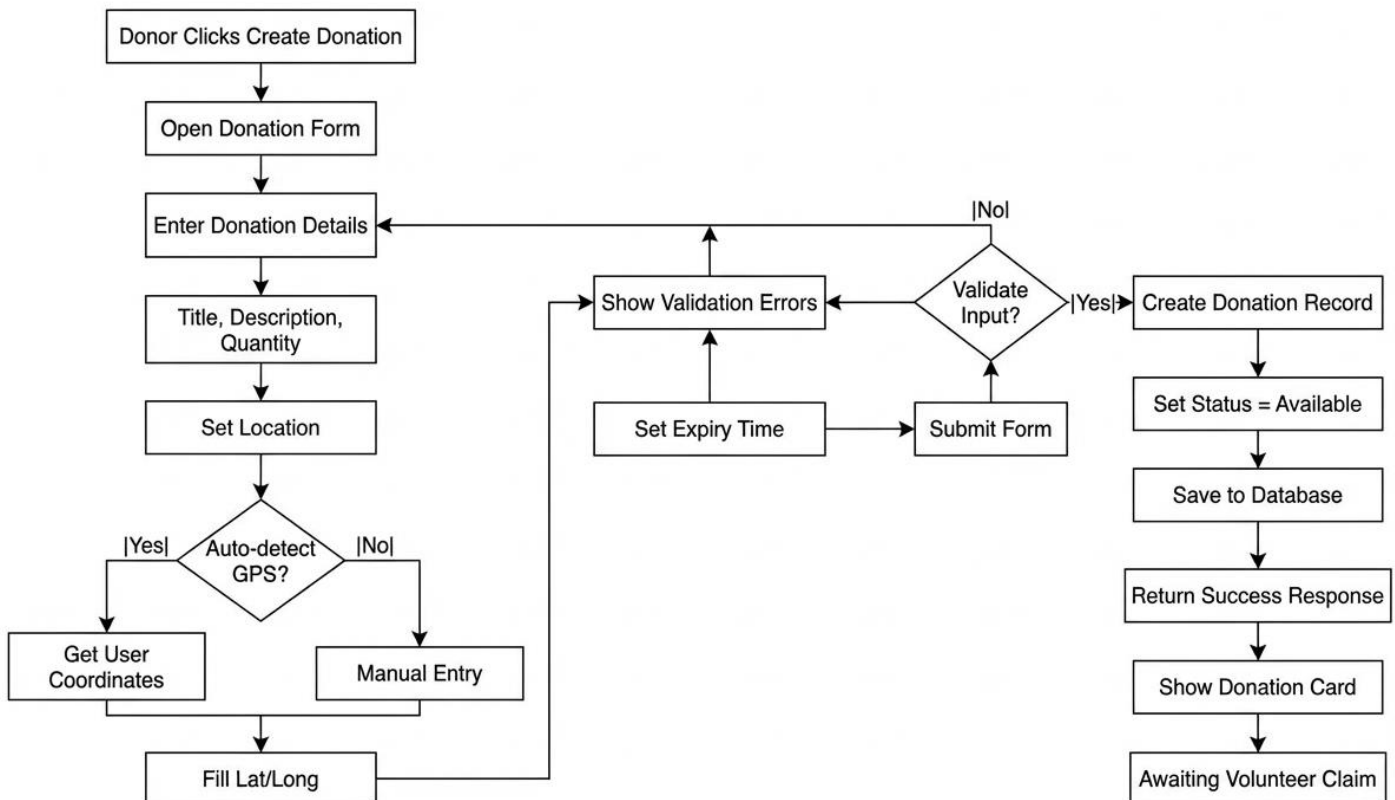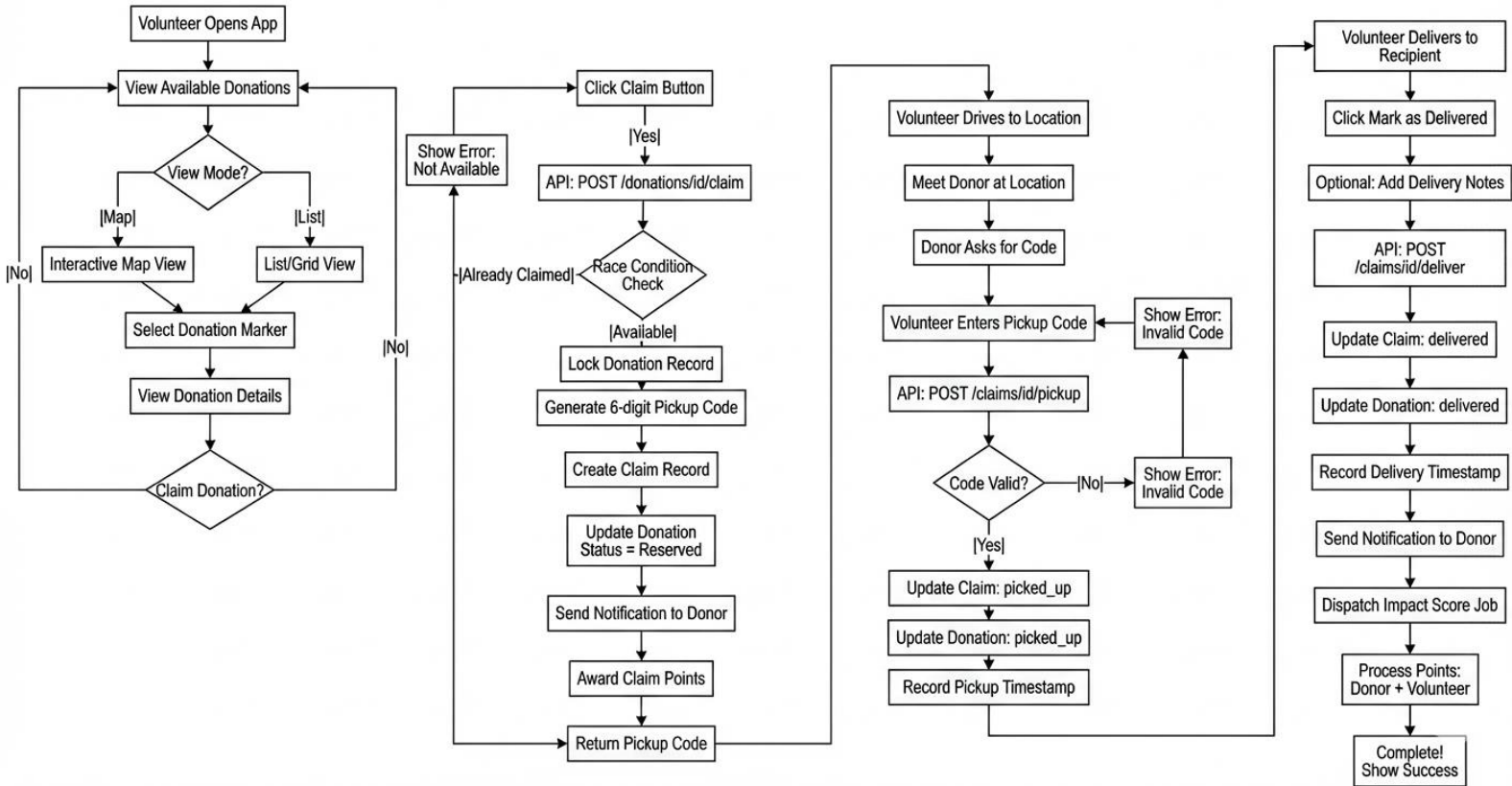# 2.1 User Registration & Authentication

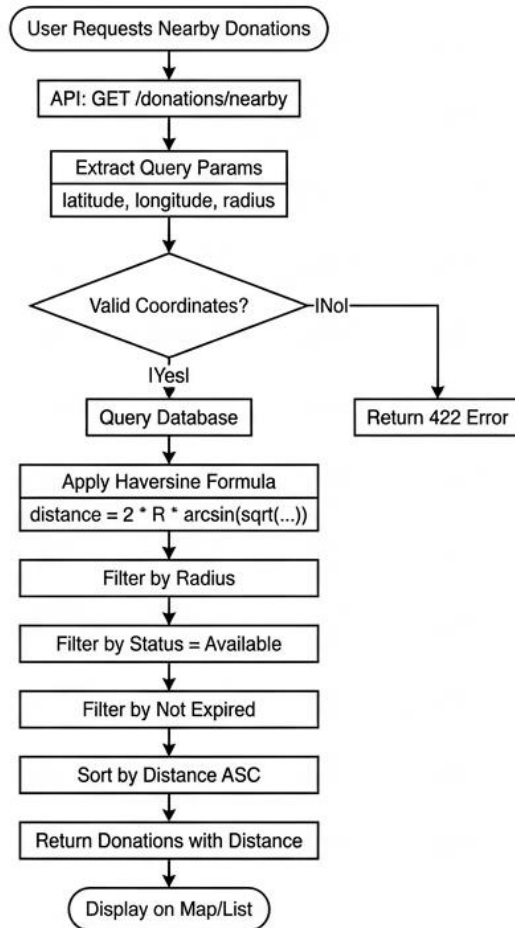

2.2 Donation Creation Flow (Donor)

Donation Claim & Delivery Flow (Volunteer)

```
Volunteer Opens App
        │
        ▼
View Available Donations ◄──────────────
        │                                │
        ▼                                │
   View Mode?                            │
   │       │                            │
 |Map|   |List|                         │
   │       │                            │
   ▼       ▼                            │
Interactive   List/Grid View            │
Map View                                │
   │       │                            │
   ▼       │                            │
Select Donation Marker ◄────            │
   │                                    │
   ▼                                    │
View Donation Details                   │
   │                                    │
   ▼                                    │
Claim Donation? ──|No|──────────────────
```

|No| → View Available Donations

```
Click Claim Button ◄─────────────
        │                         │
      |Yes|                       │
        ▼                         │
API: POST /donations/id/claim     │
        │                         │
        ▼                         │
Race Condition Check ──|Already Claimed|── Show Error: Not Available
        │
  |Available|
        ▼
Lock Donation Record
        │
        ▼
Generate 6-digit Pickup Code
        │
        ▼
Create Claim Record
        │
        ▼
Update Donation Status = Reserved
        │
        ▼
Send Notification to Donor
        │
        ▼
Award Claim Points
        │
        ▼
Return Pickup Code
```

```
Volunteer Drives to Location
        │
        ▼
Meet Donor at Location
        │
        ▼
Donor Asks for Code
        │
        ▼
Volunteer Enters Pickup Code ◄── Show Error: Invalid Code
        │
        ▼
API: POST /claims/id/pickup
        │
        ▼
Code Valid? ──|No|── Show Error: Invalid Code
        │
      |Yes|
        ▼
Update Claim: picked_up
        │
        ▼
Update Donation: picked_up
        │
        ▼
Record Pickup Timestamp
```

```
Volunteer Delivers to Recipient
        │
        ▼
Click Mark as Delivered
        │
        ▼
Optional: Add Delivery Notes
        │
        ▼
API: POST /claims/id/deliver
        │
        ▼
Update Claim: delivered
        │
        ▼
Update Donation: delivered
        │
        ▼
Record Delivery Timestamp
        │
        ▼
Send Notification to Donor
        │
        ▼
Dispatch Impact Score Job
        │
        ▼
Process Points: Donor + Volunteer
        │
        ▼
Complete! Show Success
```

2.4 Geolocation Search

```
User Requests Nearby Donations
        │
        ▼
API: GET /donations/nearby
        │
        ▼
Extract Query Params
latitude, longitude, radius
        │
        ▼
Valid Coordinates? ──|No|── Return 422 Error
        │
      |Yes|
        ▼
Query Database
        │
        ▼
Apply Haversine Formula
distance = 2 * R * arcsin(sqrt(...))
        │
        ▼
Filter by Radius
        │
        ▼
Filter by Status = Available
        │
        ▼
Filter by Not Expired
        │
        ▼
Sort by Distance ASC
        │
        ▼
Return Donations with Distance
        │
        ▼
Display on Map/List
```

2.5 Notification System Flow

```
                    A[Event Triggered]
                            |
                            v
   |Donation Claimed|   B[Event Type?]   |Donation Delivered|
        |                                         |
        v                                         v
C[DonationClaimed Notification]       D[DonationDelivered Notification]
        |                                         |
        v                                         v
   E[Get Donor User]                      F[Get Donor User]
        |                                         |
        +--------->  G[Queue Notification]  <-----+
                            |
                            v
                    H[Process via Queue]
                            |
                            v
      |Database|      I{Channels?}      |Email|
           |                                 |
           v                                 v
J[Store in Notifications Table]    K[Send Email via Mailer]
           |
           v
L[User Fetches Notifications]
           |
           v
   M[GET /notifications]
           |
           v
     N[Display in App]
           |
           v
   O[User Marks as Read]
           |
           v
P[POST /notifications/id/read]
```

2.6 Impact Score Processing Flow

```
            Delivery Completed
                    |
                    v
      Dispatch ProcessImpactScore Job
                    |
                    v
          Job Added to Queue
                    |
                    v
        Queue Worker Picks Up Job
                    |
                    v
            Process Job
                    |
                    v
        Get Donation Quantity
                    |
                    v
        Calculate Donor Points  ----->  Donor: quantity_kg * 1
                    |
                    v
        Calculate Volunteer Points  ----->  Volunteer: quantity_kg * 2
                    |
                    v
        Update Donor impact_score
                    |
                    v
        Update Volunteer impact_score
                    |
                    v
          Log Score Updates
                    |
                    v
            Job Complete
```