

# Disaster Management System

## SECTION: F

1-NAME: Manas Shetty

1-SRN: PES1UG22CS329

2-NAME: Mudar Pranav

2-SRN: PES1UG22CS362

## INTRODUCTION:

The **Disaster Management System (DMS)** facilitates effective management of disaster scenarios by enabling user registration, disaster reporting, volunteer application, and role-specific functionalities for admins, volunteers, and users. The system provides a centralized platform where NGOs can recruit and assign volunteers, users can apply as volunteers, and admins can manage disasters and approve/reject applications.

The DMS is built with **React** as the front end and **MySQL** as the back end. The application ensures secure login for all roles—users, volunteers, and admins. It is designed to be highly intuitive, ensuring role-specific access control and efficient data processing. Admins have complete control over disaster management, including adding, updating, or deleting disasters, while volunteers can browse disasters and apply to help.

Key features include:

- **User-Friendly Interface:** React ensures smooth interaction and responsive design for all user roles.
- **Role-Based Access Control:** Admins, volunteers, and users have specific access to different features.
- **Secure Data Storage:** All sensitive data is stored securely in a MySQL database.
- **Streamlined Workflow:** The system enables seamless coordination between volunteers and admins during disasters.
- **Performance:** The application ensures quick response times, even during high usage.

The system is secure, ensures efficient disaster handling, and promotes collaboration between all stakeholders.

## IMPLEMENTATION:

### Backend (MySQL):

- **Database:** MySQL is used to store all critical data, such as disaster details, user and volunteer information, admin activities, and application statuses.
- **Data Links:** Tables are linked relationally to ensure data integrity. For example, disasters are linked to volunteers applying to help, and each application is tied to specific admins for approval.

- **Data Security:** MySQL authentication and proper indexing ensure efficient and secure data retrieval.

#### Backend Logic (Node.js and Express):

- **Main Routing:** Node.js (using Express) handles API requests between the front end and back end. Each endpoint corresponds to features like user registration, volunteer applications, and disaster management.
- **Session Management:** Session handling ensures that only authenticated users can access their respective dashboards.
- **Validation:** Input validation is performed server-side to ensure the integrity of data entered by users, volunteers, or admins.

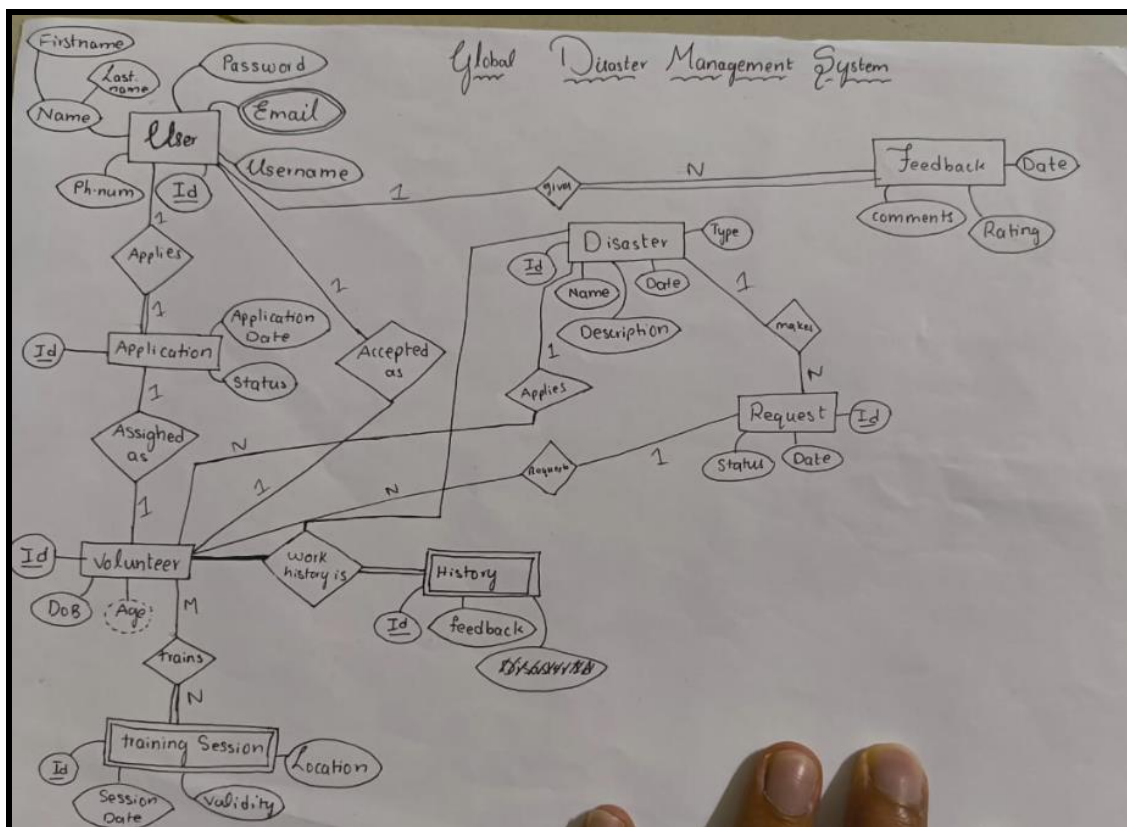
#### Frontend (React):

- **Templates:** React templates provide a dynamic and responsive user interface for all roles. It ensures smooth navigation across dashboards and workflows.
- **Role-Specific Dashboards:**
  - **Admins:** Features include disaster creation, updating disaster details, viewing volunteer applications, and approving/rejecting applications.
  - **Volunteers:** A dashboard for browsing disasters and applying to help.
  - **Users:** Basic access to the system to apply as volunteers.
- **Feedback Notifications:** Real-time updates are provided to users, such as success or error messages during actions like login, application submission, or approval.

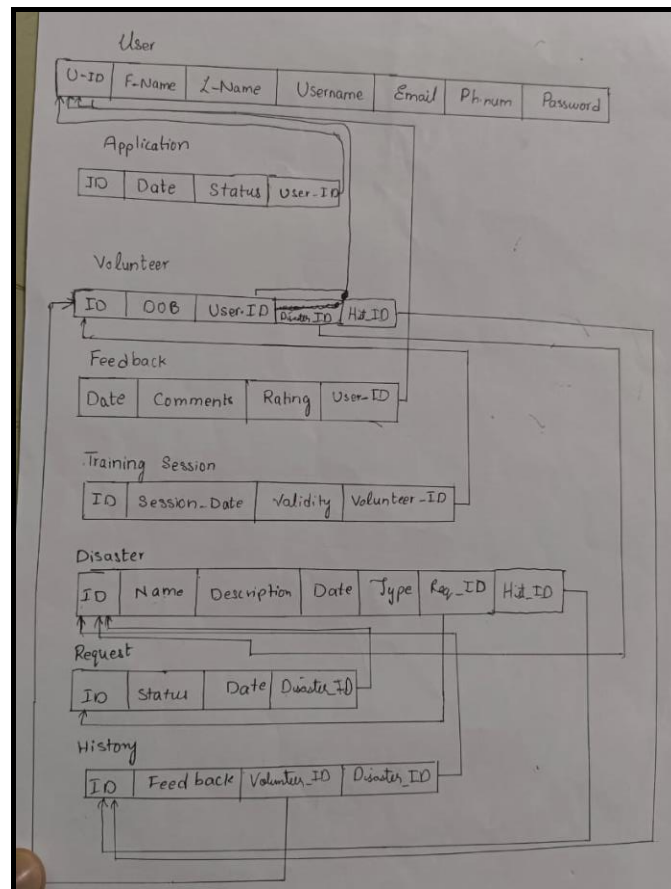
#### Additional Features:

- **Accessibility:** The interface is accessible across devices, ensuring inclusivity for all users.
- **Data Visualization:** Admin dashboards use charts and tables to visualize disaster reports and volunteer applications for easier decision-making.

## ER DIAGRAM:



## RELATIONAL SCHEMA:



## DATABASE CREATION:

```
proj.sql > ...  
  Run | New Tab | Active Connection  
1 | CREATE DATABASE IF NOT EXISTS Disaster_Management;  
  Run | New Tab  
2 | Use Disaster_Management;  
3 |
```

## TABLES:

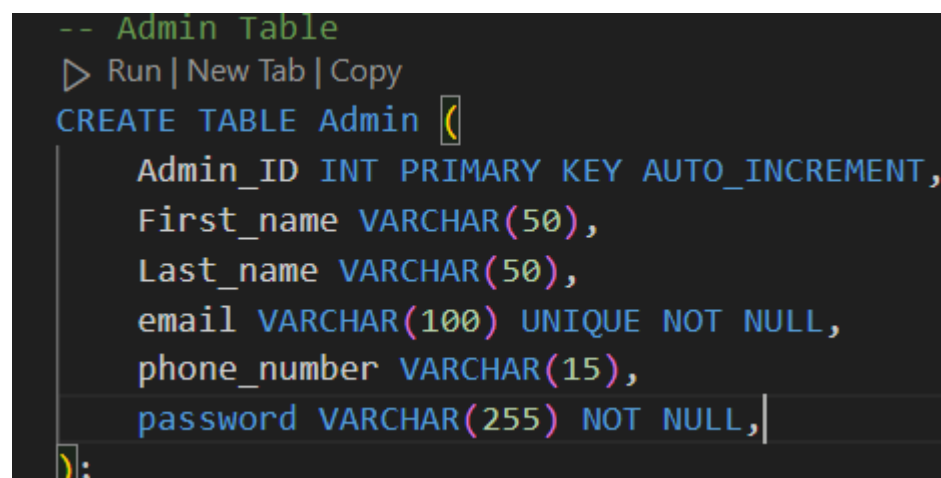
1)Admin Table:

-- Admin Table

```

CREATE TABLE Admin (
    Admin_ID INT PRIMARY KEY AUTO_INCREMENT,
    First_name VARCHAR(50),
    Last_name VARCHAR(50),
    email VARCHAR(100) UNIQUE NOT NULL,
    phone_number VARCHAR(15),
    password VARCHAR(255) NOT NULL,
);

```



The screenshot shows a SQL IDE interface with a dark background. At the top, there is a comment "-- Admin Table" in green. Below it, there are menu options: "Run", "New Tab", and "Copy". The main area displays the SQL code for creating the Admin table, which matches the code in the first block. The code is color-coded: keywords like "CREATE TABLE" and "PRIMARY KEY" are in blue, data types like "INT" and "VARCHAR" are in green, and values like "50", "100", "15", and "255" are in red. The code ends with a semicolon and a closing parenthesis.

```

-- Admin Table
Run | New Tab | Copy
CREATE TABLE Admin (
    Admin_ID INT PRIMARY KEY AUTO_INCREMENT,
    First_name VARCHAR(50),
    Last_name VARCHAR(50),
    email VARCHAR(100) UNIQUE NOT NULL,
    phone_number VARCHAR(15),
    password VARCHAR(255) NOT NULL,
);

```

2) User Table:

-- User Table

```

CREATE TABLE User (
    User_ID INT PRIMARY KEY AUTO_INCREMENT,
    First_name VARCHAR(50),
    Last_name VARCHAR(50),
    Username VARCHAR(50) UNIQUE NOT NULL,
    Email VARCHAR(100) UNIQUE NOT NULL,
    Phone_number VARCHAR(15),
    password VARCHAR(255) NOT NULL,
    DOB DATE

```

);

```
-- User Table
Run | New Tab | Copy
CREATE TABLE User (
    User_ID INT PRIMARY KEY AUTO_INCREMENT,
    First_name VARCHAR(50),
    Last_name VARCHAR(50),
    Username VARCHAR(50) UNIQUE NOT NULL,
    Email VARCHAR(100) UNIQUE NOT NULL,
    Phone_number VARCHAR(15),
    password VARCHAR(255) NOT NULL,
    DOB DATE
);
```

3) Volunteer Table:

```
-- Volunteer Table
CREATE TABLE Volunteer (
    Volunteer_ID INT PRIMARY KEY AUTO_INCREMENT,
    name VARCHAR(100),
    email VARCHAR(100) UNIQUE NOT NULL,
    phone_number VARCHAR(15),
    DOB DATE,
    U_ID INT,
    Disaster_ID INT,
    History_ID INT,
);
```

```
-- Volunteer Table
Run | New Tab | Copy
CREATE TABLE Volunteer (
    Volunteer_ID INT PRIMARY KEY AUTO_INCREMENT,
    name VARCHAR(100),
    email VARCHAR(100) UNIQUE NOT NULL,
    phone_number VARCHAR(15),
    DOB DATE,
    U_ID INT,
    Disaster_ID INT,
    History_ID INT,
);
```

#### 4) Disaster Table

-- Disaster Table

```
CREATE TABLE Disaster (
    Disaster_ID INT PRIMARY KEY AUTO_INCREMENT,
    name VARCHAR(100),
    disasterType VARCHAR(50),
    location VARCHAR(100),
    severity ENUM('low', 'medium', 'high', 'critical'),
    startDate DATE,
    endDate DATE,
    Request_ID INT,
    History_ID INT
);
```

```

-- Disaster Table
Run | New Tab | Copy
CREATE TABLE Disaster (
    Disaster_ID INT PRIMARY KEY AUTO_INCREMENT,
    name VARCHAR(100),
    disasterType VARCHAR(50),
    location VARCHAR(100),
    severity ENUM('low', 'medium', 'high', 'critical'),
    startDate DATE,
    endDate DATE,
    Request_ID INT,
    History_ID INT
);

```

5) Training Session Table:

```

CREATE TABLE Training_Session (

    session_ID INT PRIMARY KEY AUTO_INCREMENT,

    name TEXT

    Date DATE,

    Validity INT,

    Conducted_by INT

);

```

```

-- Training Session Table
Run | New Tab | Copy
CREATE TABLE Training_Session (
    session_ID INT PRIMARY KEY AUTO_INCREMENT,
    name TEXT
    Date DATE,
    Validity INT,
    Conducted_by INT
);

```

#### 6) Session\_Registration Table:

```
-- Session Registrations Table
Run | New Tab | Copy
CREATE TABLE Session_registrations (
    Session_ID INT,
    Volunteer_ID INT,
    Status ENUM('registered', 'completed', 'failed'),
    Final_registration_date DATE,
    Successful_Completion BOOLEAN DEFAULT FALSE,
    PRIMARY KEY (Session_ID, Volunteer_ID)
);
```

#### 7) History Table:

```
-- History Table
Run | New Tab | Copy
CREATE TABLE History (
    History_ID INT PRIMARY KEY AUTO_INCREMENT,
    Feedback TEXT,
    Volunteer_ID INT,
    Disaster_ID INT
);
```

## TRIGGERS:

Our trigger performs a cascading update, when user details are updated, then volunteer details also get updated with the same



DELIMITER \$\$

CREATE TRIGGER update\_volunteer\_details

AFTER UPDATE ON Users

FOR EACH ROW

BEGIN

-- Update the Volunteer table when user details are updated

UPDATE Volunteers

SET

first\_name = NEW.First\_name,

last\_name = NEW.Last\_name,

email = NEW.Email,

phone\_number = NEW.Phone\_number

WHERE user\_id = NEW.User\_ID;

END\$\$

DELIMITER ;

```
trigger.sql > ...
  Run | New Tab | Active Connection
1 DELIMITER $$
2
  Run | Copy
3 CREATE TRIGGER update_volunteer_details
4 AFTER UPDATE ON Users
5 FOR EACH ROW
6 BEGIN
7   -- Update the Volunteer table when user details are updated
8   UPDATE Volunteers
9   SET
10    first_name = NEW.First_name,
11    last_name = NEW.Last_name,
12    email = NEW.Email,
13    phone_number = NEW.Phone_number
14   WHERE user_id = NEW.User_ID;
15 END$$
16
  Run | New Tab
17 DELIMITER ;
18
```

## PROCEDURES:

Our stored procedure, does multiple table joins to fetch relevant volunteer history and displays it for the admin to review

```
DELIMITER $$
```

```
CREATE PROCEDURE GetVolunteerHistory(IN VolunteerID INT)
```

```
BEGIN
```

```
SELECT
```

```
    h.History_ID,
```

```
    h.Feedback,
```

```
    v.first_name AS Volunteer_FirstName,
```

```
v.last_name AS Volunteer_LastName,  
d.name AS Disaster_Name,  
d.location AS Disaster_Location,  
d.disasterType AS Disaster_Type,  
d.severity AS Disaster_Severity  
FROM  
    histories h  
JOIN  
    Volunteers v ON h.Volunteer_ID = v.Volunteer_ID  
JOIN  
    Disasters d ON h.Disaster_ID = d.Disaster_ID  
WHERE  
    h.Volunteer_ID = VolunteerID;  
END$$  
  
DELIMITER ;
```

```
stored_procedure.sql > ...
  Run | New Tab | Active Connection
1 DELIMITER $$
2
  Run | Copy
3 CREATE PROCEDURE GetVolunteerHistory(IN VolunteerID INT)
4 BEGIN
5     SELECT
6         h.History_ID,
7         h.Feedback,
8         v.first_name AS Volunteer_FirstName,
9         v.last_name AS Volunteer_LastName,
10        d.name AS Disaster_Name,
11        d.location AS Disaster_Location,
12        d.disasterType AS Disaster_Type,
13        d.severity AS Disaster_Severity
14    FROM
15        histories h
16    JOIN
17        Volunteers v ON h.Volunteer_ID = v.Volunteer_ID
18    JOIN
19        Disasters d ON h.Disaster_ID = d.Disaster_ID
20    WHERE
21        h.Volunteer_ID = VolunteerID;
22 END$$
23
  Run | New Tab
24 DELIMITER ;
25
```

## QUERIES:

1)

// Insert admin into the database

```
const query = `
```

```
    INSERT INTO Admin (First_name, Last_name, email, phone_number, password)
```

```
    VALUES ('${First_name}', '${Last_name}', '${email}', '${phone_number}',
    '${hashedPassword}')
```

```
// Insert admin into the database
const query = `
    INSERT INTO Admin (First_name, Last_name, email, phone_number, password)
    VALUES ('${First_name}', '${Last_name}', '${email}', '${phone_number}', '${hashedPassword}')
`;
```

2)

```
const insertQuery = `
```

```
    INSERT INTO User (First_name, Last_name, Username, Email, Phone_number,  
password, DOB)
```

```
    VALUES ('${first_name}', '${last_name}', '${username}', '${email}', '${phone_number}',  
`${hashedPassword}', '${dob}')
```

```
    `;
```

```
// Insert new user  
const insertQuery = `  
    INSERT INTO User (First_name, Last_name, Username, Email, Phone_number, password, DOB)  
    VALUES ('${first_name}', '${last_name}', '${username}', '${email}', '${phone_number}', '${hashedPassword}', '${dob}')  
    `;
```

3)

```
// Update user data
```

```
const updateQuery = `
```

```
    UPDATE User
```

```
    SET First_name = '${First_name}', Last_name = '${Last_name}', Username =  
`${Username}', Email = '${Email}', Phone_number = '${Phone_number}'
```

```
    WHERE User_ID = '${userId}'
```

```
    `;
```

```
try {  
    // Update user data  
    const updateQuery = `  
        UPDATE User  
        SET First_name = '${First_name}', Last_name = '${Last_name}', Username = '${Username}', Email = '${Email}', Phone_number = '${P  
        WHERE User_ID = '${userId}'  
    `;  
}
```

4)

```
// Link volunteer to the disaster
```

```
const applyQuery = `
```

```
    UPDATE Volunteer
```

```
    SET Disaster_ID = '${disasterId}'
```

```
WHERE User_ID = '${volunteerId}'  
`;  
`;
```

```
// Link volunteer to the disaster  
const applyQuery = `  
  UPDATE Volunteer  
  SET Disaster_ID = '${disasterId}'  
  WHERE User_ID = '${volunteerId}'  
`;  
`;
```

5)

// Update existing feedback

```
const updateQuery = `  
  UPDATE History  
  SET Feedback = ${mysql.escape(Feedback)}  
  WHERE Volunteer_ID = ${mysql.escape(Volunteer_ID)} AND Disaster_ID =  
  ${mysql.escape(Disaster_ID)}  
`;  
`;
```

```
// Update existing feedback  
const updateQuery = `  
  UPDATE History  
  SET Feedback = ${mysql.escape(Feedback)}  
  WHERE Volunteer_ID = ${mysql.escape(Volunteer_ID)} AND Disaster_ID = ${mysql.escape(Disaster_ID)}  
`;  
db.query(updateQuery, (err) => {
```

6)

// Check if the volunteer is already registered

```
const checkRegistrationQuery = `  
  SELECT * FROM Session_registrations WHERE Session_ID = '${Session_ID}' AND  
  Volunteer_ID = '${Volunteer_ID}'
```

```
`;  
`;
```

```
// Check if the volunteer is already registered  
const checkRegistrationQuery = `  
  SELECT * FROM Session_registrations WHERE Session_ID = '${Session_ID}' AND Volunteer_ID = '${Volunteer_ID}'  
`;  
`;
```

7)

// Get all training sessions

exports.getTrainingSessions = (req, res) => {

const query = `

SELECT ts.\*, v.first\_name, v.last\_name

FROM Training\_Session ts

LEFT JOIN Volunteer v ON ts.Conducted\_by = v.Volunteer\_ID

`;  
`;

```
// Get all training sessions  
exports.getTrainingSessions = (req, res) => {  
  const query = `  
    SELECT ts.*, v.first_name, v.last_name  
    FROM Training_Session ts  
    LEFT JOIN Volunteer v ON ts.Conducted_by = v.Volunteer_ID  
  `;  
`;
```

8)

// Get volunteers with their assigned disasters

exports.getVolunteersWithDisasters = (req, res) => {

const query = `

SELECT v.\*, d.name, d.disasterType, d.location

FROM Volunteer v

LEFT JOIN Disaster d ON v.Disaster\_ID = d.Disaster\_ID

`;

```
// Get volunteers with their assigned disasters
exports.getVolunteersWithDisasters = (req, res) => {
  const query = `
    SELECT v.*, d.name, d.disasterType, d.location
    FROM Volunteer v
    LEFT JOIN Disaster d ON v.Disaster_ID = d.Disaster_ID
  `;

```

## RELATIONSHIP TABLES:

```
History.belongsTo(Volunteer, { foreignKey: 'Volunteer_ID', onDelete: 'CASCADE' });
History.belongsTo(Disaster, { foreignKey: 'Disaster_ID', onDelete: 'CASCADE' });
```

```
// Associate with Volunteer and enable cascading delete
Volunteer.hasMany(SessionRegistrations, { foreignKey: 'Volunteer_ID', onDelete: 'CASCADE' });
SessionRegistrations.belongsTo(Volunteer, { foreignKey: 'Volunteer_ID', onDelete: 'CASCADE' });
```

```
// Define association with cascading delete
TrainingSession.belongsTo(Volunteer, {
  as: 'ConductedByVolunteer',
  foreignKey: 'Conducted_by',
  onDelete: 'CASCADE'
});

Volunteer.hasMany(TrainingSession, {
  foreignKey: 'Conducted_by',
  onDelete: 'CASCADE'
});
```

```
Volunteer.belongsTo(Disaster, { as: 'appliedDisaster', foreignKey: 'Disaster_ID' });
Volunteer.belongsTo(User, { foreignKey: 'user_id', onDelete: 'CASCADE' });
User.hasOne(Volunteer, { foreignKey: 'user_id', onDelete: 'CASCADE' });
```



## HTML PART:

### 1) Registration page:

localhost:3001/register

localhost:3001 says  
User registered successfully

**Username**  
user

**Email**  
user@gmail.com

**Phone Number**  
9999900000

**Date of Birth (Can't be changed later!)**  
10-02-2004

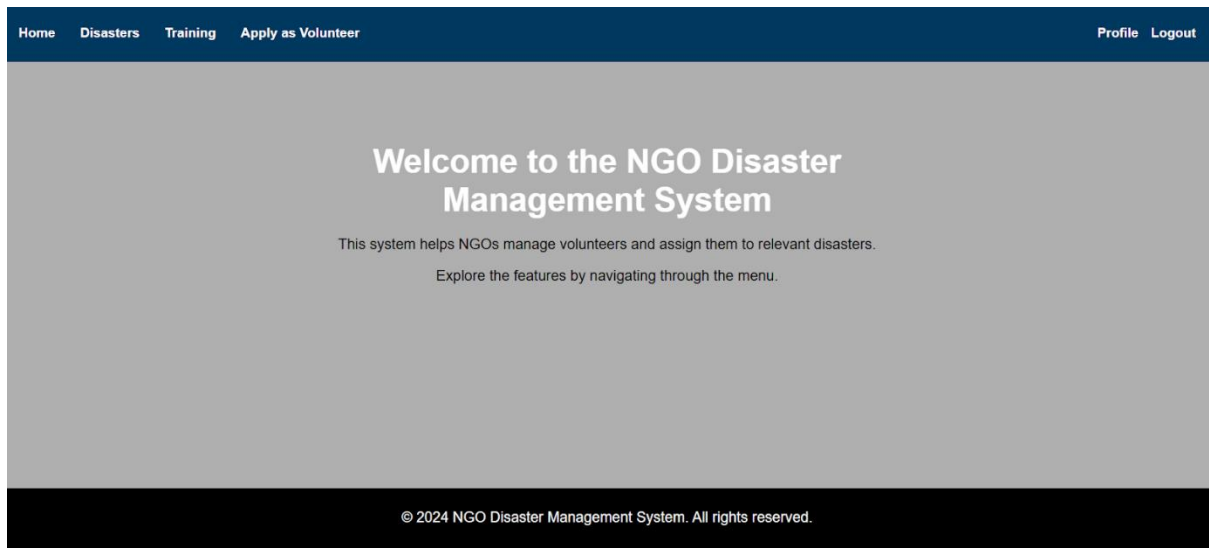
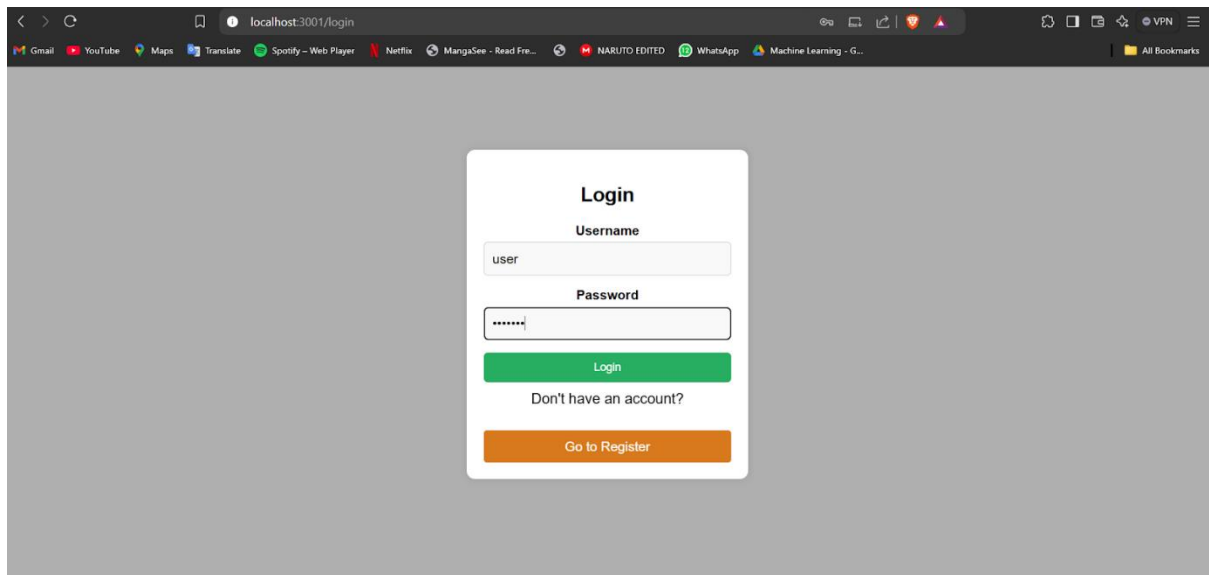
**Password**  
.....

Register

Already have an account?

Go to Login

### Login page:



## Admin registration and login:

## Admin Registration

Register as Admin

## Admin Login

Login

Existing user:

Netflix

ine Learning

localhost:3001 says

Username already exists

OK

Username

user

Email

user@gmail.com

Phone Number

9999900000

Date of Birth (Can't be changed later!)

31 - 10 - 2024

Password

.....

Register

Already have an account?

Go to Login

## User viewing disasters:

Existing Disasters				
Only volunteers can apply to disasters				
Name	Location	Type	Severity	Action
bigscarytsunami	Japan	Tsunami	critical	Apply to Volunteer
smn	Bangalore	tornado	low	Apply to Volunteer

## Registering as Volunteer:

# Volunteer Registration

First Name: rahul

Last Name: rao

Email: user@gmail.com

Phone Number: 9999900000

Date of Birth: 10-02-2004

Apply as Volunteer

Volunteer registered successfully

## Adding Disaster as Admin:

Hurricane Aurora	Miami	Hurricane	critical
Forest Fire Inferno	California	Wildfire	high
Riverbank Deluge	Missouri	Flood	medium
Earthquake Rupture	Nepal	Earthquake	critical
Tornado Fury	Oklahoma	Tornado	high
Blizzard Whiteout	North Dakota	Blizzard	medium

### Add a New Disaster

Volcanic Eruption Lavaflow

Volcanic Eruption

Iceland

Severity:  
Critical

Start Date:  
08-06-2024

Add Disaster

## Volunteers applying for a disaster:

Existing Disasters

Successfully applied to the disaster

Name	Location	Type	Severity	Action
bigscarytsunami	Japan	Tsunami	critical	Apply to Volunteer
smn	Bangalore	tornado	low	Apply to Volunteer
Hurricane Aurora	Miami	Hurricane	critical	Apply to Volunteer
Forest Fire Inferno	California	Wildfire	high	Apply to Volunteer
Riverbank Deluge	Missouri	Flood	medium	Apply to Volunteer
Earthquake Rupture	Nepal	Earthquake	critical	Apply to Volunteer
Tornado Fury	Oklahoma	Tornado	high	Apply to Volunteer
Blizzard Whiteout	North Dakota	Blizzard	medium	Apply to Volunteer

Admins can create Training Sessions:

Survival skills	12-12-2024	12	johnny smith
Imp stuff	11-12-2024	8	johnny smith
Emergency Response Essentials	01-01-2025	6	akshay kannan
Disaster Communication Skills	15-02-2025	12	akshay kannan
Fire Safety and Rescue Techniques	20-03-2024	9	rahul rao
Flood Evacuation Drills	25-04-2024	12	johnny smith

Create New Session

Session Name:

Flood Evacuation Drills

Session Date:

25-04-2024

Validity (months):

12

Conducted By (Volunteer ID):

1

Create Session

- Volunteer registering for a session:

## Training Sessions

Successfully registered for session

### Available Sessions

Session Name	Date	Validity (months)	Conducted By	Action
Survival skills	12-12-2024	12	johnny smith	<a href="#">Register</a>
Imp stuff	11-12-2024	8	johnny smith	<a href="#">Register</a>
Emergency Response Essentials	01-01-2025	6	akshay kannan	<a href="#">Register</a>
Disaster Communication Skills	15-02-2025	12	akshay kannan	<a href="#">Register</a>
Fire Safety and Rescue Techniques	20-03-2024	9	rahul rao	<a href="#">Register</a>
Flood Evacuation Drills	25-04-2024	12	johnny smith	<a href="#">Register</a>

## Volunteer registering for a session they already registered for:

## Training Sessions

You have already registered for this session.

### Available Sessions

Session Name	Date	Validity (months)	Conducted By	Action
Survival skills	12-12-2024	12	johnny smith	<a href="#">Register</a>
Imp stuff	11-12-2024	8	johnny smith	<a href="#">Register</a>
Emergency Response Essentials	01-01-2025	6	akshay kannan	<a href="#">Register</a>
Disaster Communication Skills	15-02-2025	12	akshay kannan	<a href="#">Register</a>
Fire Safety and Rescue Techniques	20-03-2024	9	rahul rao	<a href="#">Register</a>
Flood Evacuation Drills	25-04-2024	12	johnny smith	<a href="#">Register</a>

## Volunteer trying to register for a session they are hosting:

# Training Sessions

You cannot register for a session you are conducting

## Available Sessions

Session Name	Date	Validity (months)	Conducted By	Action
Survival skills	12-12-2024	12	johnny smith	<button>Register</button>
Imp stuff	11-12-2024	8	johnny smith	<button>Register</button>
Emergency Response Essentials	01-01-2025	6	akshay kannan	<button>Register</button>
Disaster Communication Skills	15-02-2025	12	akshay kannan	<button>Register</button>
Fire Safety and Rescue Techniques	20-03-2024	9	rahul rao	<button>Register</button>
Flood Evacuation Drills	25-04-2024	12	johnny smith	<button>Register</button>

## Deleting User account:

HomeDisastersTrainingApply as Volunteer

Are you sure you want to delete your account? This action cannot be undone.

OKCancel

User Profile

First Name: akshay

Last Name: kannan

Username: akshay

Email: akshay.kannan@gmail.com

Phone Number: 9591799577

Date of Birth: 10-03-2004

Edit Profile

Delete Account

Back to Home

ProfileLogout

## Editing User Profile:



## User Profile

**First Name:**

john

**Last Name:**

smith

**Username:**

lol

**Email:**

js@gmail.com

**Phone Number:**

9999999999

Save Changes

Back to Home

## User Profile

**First Name:** john

**Last Name:** smith

**Username:** lol

**Email:** js@gmail.com

**Phone Number:** 9999999999

**Date of Birth:** 11-11-2000

Edit Profile

Delete  
Account

Back to Home

### Admin can give feedback on volunteers:

#### Volunteer Feedback

Volunteer Name	Disaster Name	Feedback	Action
john smith	bigscarytsunami		Submit
akshay kannan	smn		Submit
rahul rao	Forest Fire Inferno		Submit

### Admin can see list of volunteers and disasters they applied for:

# Volunteers Page

Name	Email	Phone	Applied Disaster
john smith	js@gmail.com	9999999999	Riverbank Deluge (Flood)
akshay kannan	akshay.kannan@gmail.com	9591799577	Volcanic Eruption Lavaflow (Volcanic Eruption )
rahul rao	user@gmail.com	9999900000	Forest Fire Inferno (Wildfire)

THANK YOU