VolunteerHub: A Volunteer Management System
DBMS Mini Project

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May 20, 2025

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Abstract

Project Overview

VolunteerHub is a comprehensive web-based volunteer management system designed to streamline the process of organizing volunteer events, tracking participation, and rewarding volunteers through a points-based system.
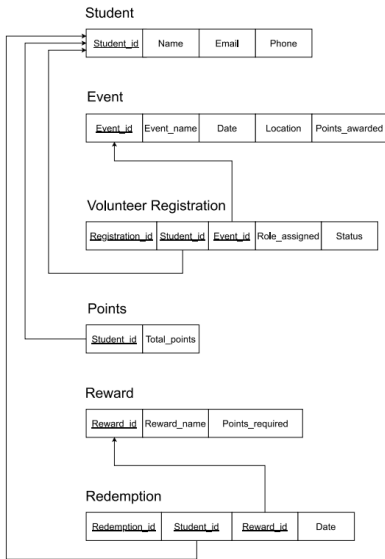
Key Features

- User and admin authentication with role-based access control
- Event creation, management, and volunteer registration
- Point tracking system for volunteer activities
- Reward redemption mechanism for earned points
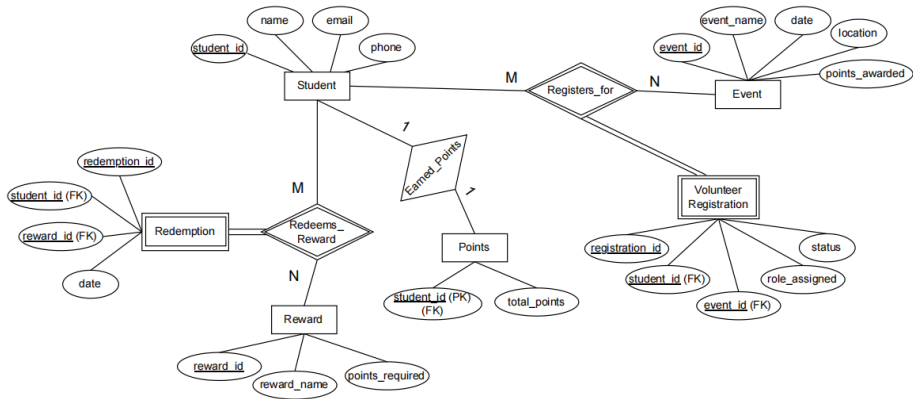- Comprehensive reporting and analytics

Objectives

- Design and implement a database system to efficiently store and retrieve volunteer data
- Create a secure authentication system with separated user and admin roles
- Develop a point tracking mechanism to incentivize volunteer participation
- Build a reward system allowing volunteers to redeem points for benefits
- Implement a user-friendly interface for both administrators and volunteers
- Provide detailed analytics and reporting features for volunteer activities
- Enable administrators to manage events and track volunteer participation

Database Schema

Student

Student_id	Name	Email	Phone

Event

Event_id	Event_name	Date	Location	Points_awarded

Volunteer Registration

Registration_id	Student_id	Event_id	Role_assigned	Status

Points

Student_id	Total_points

Reward

Reward_id	Reward_name	Points_required

Redemption

Redemption_id	Student_id	Reward_id	Date

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ER Diagram

System Requirements

Hardware Requirements

- Processor: Any modern dual-core processor
- RAM: 4GB or higher
- Disk Space: 1GB for application
- Network: Internet connection

Software Requirements

- Operating System: Windows/Linux/macOS
- Python 3.8+
- Flask Framework
- SQLite Database
- Web Browser (Chrome/Firefox/Edge)

Technologies Used

Backend

- Python 3.8+
- Flask Web Framework
- SQLite Database
- Hashlib (for password encryption)

Frontend

- HTML5, CSS3
- JavaScript
- Jinja2 Templating
- Responsive Design

Development Tools

- Visual Studio Code
- Git for version control
- Web browsers for testing

Database Tables

- **students**: Stores user/volunteer information
- **events**: Contains details about volunteer events
- **registrations**: Manages volunteer registrations for events
- **points**: Tracks points earned by volunteers
- **rewards**: Lists available rewards for redemption
- **redemptions**: Records reward redemption history
- **points_adjustments**: Logs manual point adjustments

Table Relationships

- One student can register for many events (*one-to-many*)
- One student can redeem many rewards (*one-to-many*)
- One student has one points record (*one-to-one*)
- One event can have many volunteer registrations (*one-to-many*)
- One reward can be redeemed many times (*one-to-many*)

Key Features

- Foreign key constraints to maintain data integrity
- Timestamps for audit trails
- Status tracking for volunteer activities

Application Features

Admin Features:

- Dashboard with analytics
- Student management
- Event creation and management
- Volunteer registration tracking
- Ability to assign roles to volunteers
- Manual point adjustment capability
- Mark volunteer activities as completed
- View redemption history

User/Volunteer Features:

- Registration for volunteer events
- Points tracking dashboard
- Reward redemption
- View participation history

Security Measures

- Password hashing using SHA-256
- Input validation for all form submissions
- Role-based access control
- Session management
- Protection against SQL injection
- Strong password requirements:
  - Minimum 8 characters
  - Uppercase and lowercase letters
  - Numbers and special characters

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User Interface - Home Page

VolunteerHub

Home

Sign In

Make a Difference, Earn Rewards

Join our volunteer program and earn points for your contributions

Get Started   Sign In

How It Works

1

Register

Sign up for an account and browse available volunteer opportunities

2

Earn Points

Volunteer for events and earn points for your contributions

3

Redeem Rewards

Use your points to redeem exciting rewards and benefits

User Interface - Sign Up

VolunteerHub   Home   ☾   Sign In ⌄

Create Account

Join our volunteer community

Full Name

👤 Enter your full name

Email Address

✉ Enter your email address

Phone Number (Optional)

📞 Enter your phone number (optional)

Password

🔒 Create a password

Confirm Password

🔒 Confirm your password

Password must:
Be at least 8 characters long
Contain at least one uppercase letter
Contain at least one lowercase letter
Contain at least one number
Contain at least one special character

Create Account

Already have an account? Sign In

User Interface - Sign In

User Interface - Admin Dashboard

User Interface - Admin Student List

User Interface - Admin Event Management

User Interface - Admin Rewards System

VolunteerHub   Home   Dashboard   Students   Events   Rewards   Redemptions   ☾   Administrator ⌄

Add New Reward
Create a new reward for students

← Back to List

Reward Name

Enter reward name

Points Required

50

Description

Enter reward description (optional)

Add Reward   Reset

VolunteerHub

Empowering students through volunteering

Quick Links

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User Interface - Student Dashboard

VolunteerHub   Home Dashboard Events My Points Rewards   ☾ Adithya S ⌄

Welcome, Adithya S!
Here's an overview of your volunteer activities and rewards.   [⚆ Register for Event] [⚘ Redeem Reward]

150
Points

Your Volunteer Points
Use your points to redeem exciting rewards!

[View Details]

Upcoming Events   View All

| 06
20 | **Charity Run**
◎ City Park
⑤ 75 Points | Register |

| 06
01 | **Food Drive**
◎ Student Center
⑤ 60 Points | Register |

Available Rewards   View All

☕ **Cafeteria Meal Pass**
⑤ 75 Points   Redeem

▭ **Campus Bookstore Voucher**
⑤ 100 Points   Redeem

☀ **University Merchandise**
⑤ 150 Points   Redeem

My Registrations   View All

You haven't registered for any events yet.
[Browse Events]

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User Interface - Student Register

VolunteerHub

Home   Dashboard   Events   My Points   Rewards

Adithya S ⌄

Register as Volunteer

Sign up to volunteer for an event

← Back to Events

Event

Charity Run (2025-05-20) - 75 points ⌄

Notes (Optional)

Any special requirements or information

Register   Reset

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User Interface - Student Points Management

VolunteerHub

Home   Dashboard   Events   My Points   Rewards

Aditya S

My Points

Track your volunteer points and activities

Your Volunteer Points

150 Points

Use your points to redeem exciting rewards!

View Rewards

My Volunteer Activities

No Activities Yet

You haven't registered for any volunteer events yet.

Browse Events

Points History

No Points History

You haven't earned or spent any points yet.

User Interface - Student Rewards System

VolunteerHub

Home   Dashboard   Events   My Points   Rewards

Adithya S ∨

Rewards

Browse and redeem rewards with your earned points

Redeem New Reward

Cafeteria Meal Pass
75 Points Required

Redeem

Free meal at the university cafeteria

Campus Bookstore Voucher
100 Points Required

Redeem

A $20 voucher for the campus bookstore

University Merchandise
150 Points Required

Redeem

Choose from university-branded items

Priority Course Registration
200 Points Required

Redeem

Register for courses before your peers

Redemption History

No Redemptions Yet

You haven't redeemed any rewards yet.

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User Interface - Student Rewards System

VolunteerHub   Home Dashboard Events My Points Rewards   Adithya S ⌄

Redeem Reward

Use your points to claim a reward   ← Back to Rewards

Reward

| University Merchandise (150 points) ⌄ |

Available Points: 150
Required Points: 150

Remaining Points: **0**

Notes (Optional)

Any special requirements or delivery instructions

[Redeem Reward] [Reset]

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Outcomes

Project Achievements

- Implemented a full-featured volunteer management system
- Created an intuitive, responsive user interface
- Developed a secure points tracking and reward system
- Implemented comprehensive admin controls for event management
- Ensured data integrity with proper validation and constraints

Key Learnings

- Database design principles and normalization
- Web application security best practices
- Full-stack development with Flask
- User experience considerations in application design
- Points-based incentive system implementation

Conclusion

- VolunteerHub provides an efficient solution for managing volunteer activities
- The points-based system effectively incentivizes student participation
- The application successfully addresses the needs of both administrators and volunteers
- The system can be easily extended with additional features
- Potential future enhancements:
    - Email notifications
    - Mobile application
    - Analytics dashboard with visualizations
    - Integration with other campus systems

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Thank You!

Questions & Feedback?

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