Report on

Food Waste Management System

Prepared for

Mr. Md. Siam Ansary, Lecturer

Ms. Suravi Akhter, Lecturer

Course No: CSE 3224

Course Name: Information System Design and Software Engineering Lab

Prepared by

Lab Section: A2

Group No: 02

Ahmed Al Wase, 190104034

Akila Maksud, 190104038

Aurunave Mollik Ruddra, 190104046

Syeda Annan Asrafi, 190104050

Date: 01.09.2022

Department of Computer Science and Engineering

List of Contents:

Introduction:

Zero Waste is a software to reduce food waste and serve needy people. This software will help to create a better and easier way to communicate with NGOs / charity organizations. With the help of this software, people can donate food to help poor people. Because someone is dying for the food we are throwing away.

Summary of the Project:

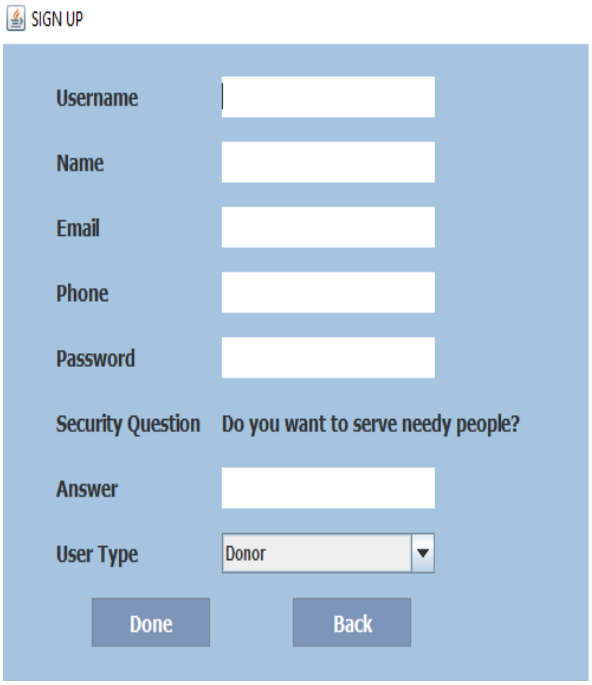
In our country, a lot of parties are arranged daily with a lot of food and other products. Most of them are left for waste or unused. We are all wasting food for various reasons. To solve this problem we have come up with reducing food waste management system named ZERO WASTE where a person can register and request to donate to any event to our system and the admin can accept the donated food and our volunteer team pay a visit to them at a given time and pick the order and for the provide the food to the needy, where most people are without food according to the need status. In this application, the user can log in and enter the amount of food and the type of food available. After that, the admin will confirm the donation from the donor. Admin, Donor, and Volunteer have their own account in this application and they can retrieve the details about any event. This food distribution project is an enormously successful social innovation that tackles food waste and poverty.

Here are the details of our project with proper pictures:

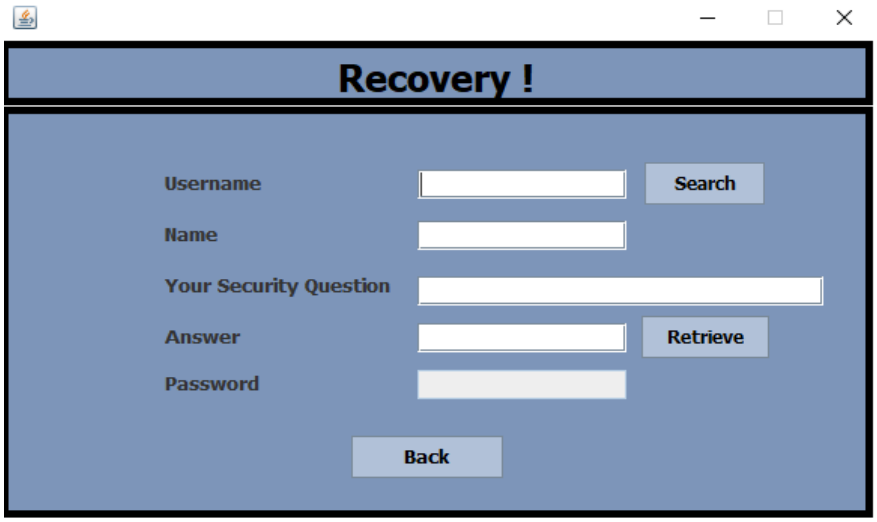
- **An animation screen:**
  It will appear at the start of our software.

- **Login**
  The login interface will appear after the animation. Providing the correct username, password, and user type users will be able to successfully log in to our software.

- **Registration:**
  If the user is not registered to this software then he will be able to register himself by clicking on the signup button of the login interface he will be redirected to the Signup page. Here the username can not be "Admin" and the security questing is generated at a random index.



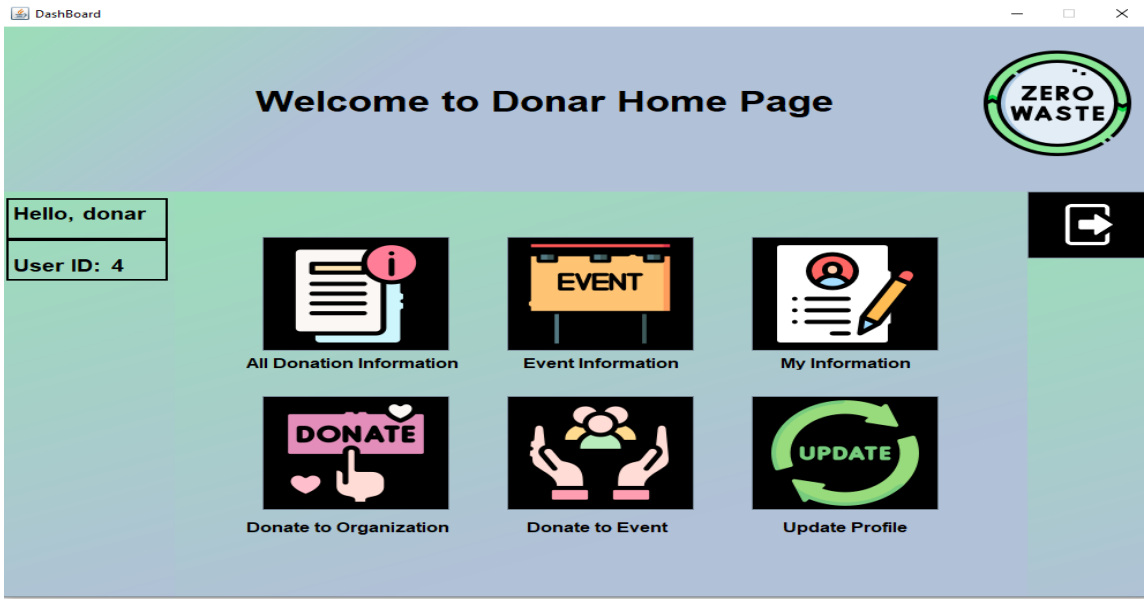
- **Forgot Password:**
  If a registered user forgot his password then he will be able to retrieve his password. By clicking on the Forgot Password option the user will be redirected to the Forgot Password page.



<u>Donor's Side:</u>
After the successful login of the donor in the meantime of opening the Donar Home Page, a loading page will be displayed.

- **Donor Dashboard:**

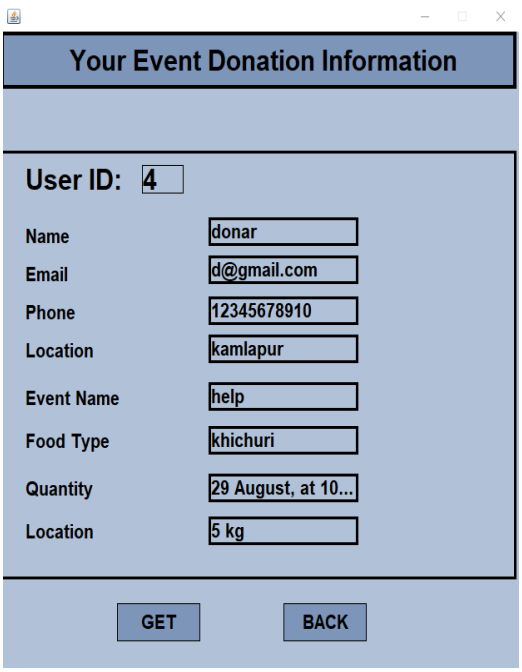
If the logged-in user is a donor then he will be redirected to the donor dashboard. Here on the left side's panel user names and IDs will be visible. And rightmost panel's exit button will terminate the execution of this software.

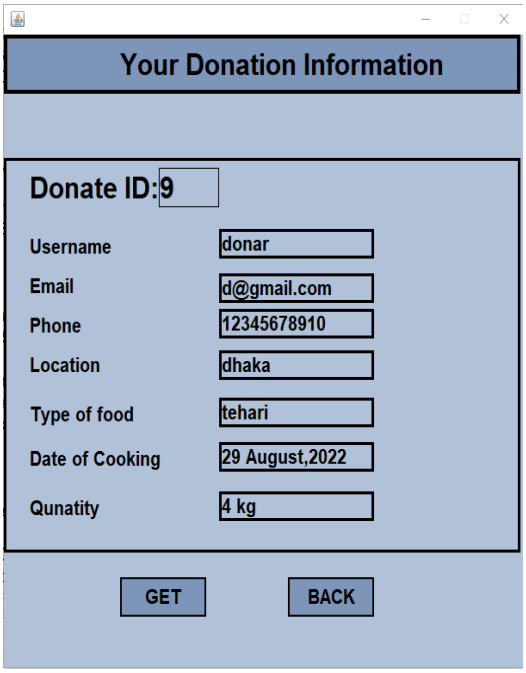


- **All Donation Information Dashboard:**
  Here there are four menus on the menu bar. Each option represents detailed information about the donation scenario. The utility menu holds a notepad, calculator, and a back option to move the home page of the donor.

- **Donation Information Form:**
  The information holds to menu items. One is for showing the details of the donation to the organization and another one is for showing the donation details to an event of the logged-in donor. The following forms are to show logged-in donors' specific

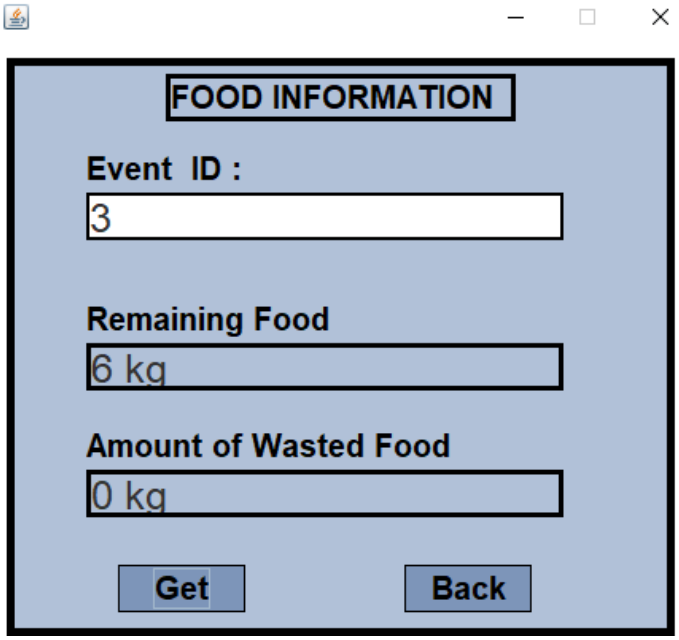
donation and event donation information. The Donate Id and User id will be set on the label after entering this page and by clicking on the "GET" button, the user will be able to see all donation-related information. Here All the text is non-editable.



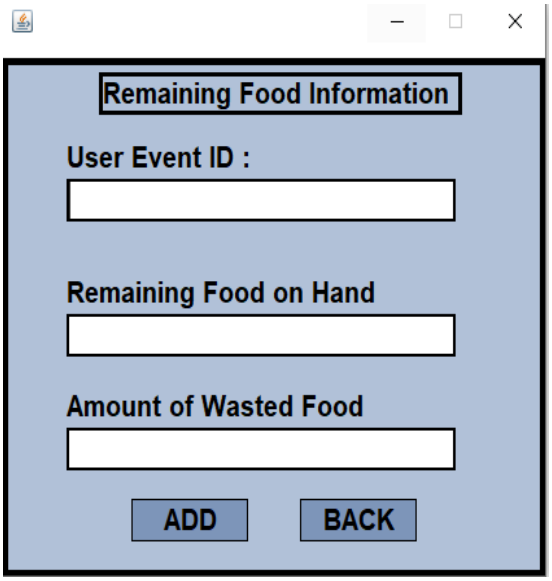


- **Wasted Food Information:**

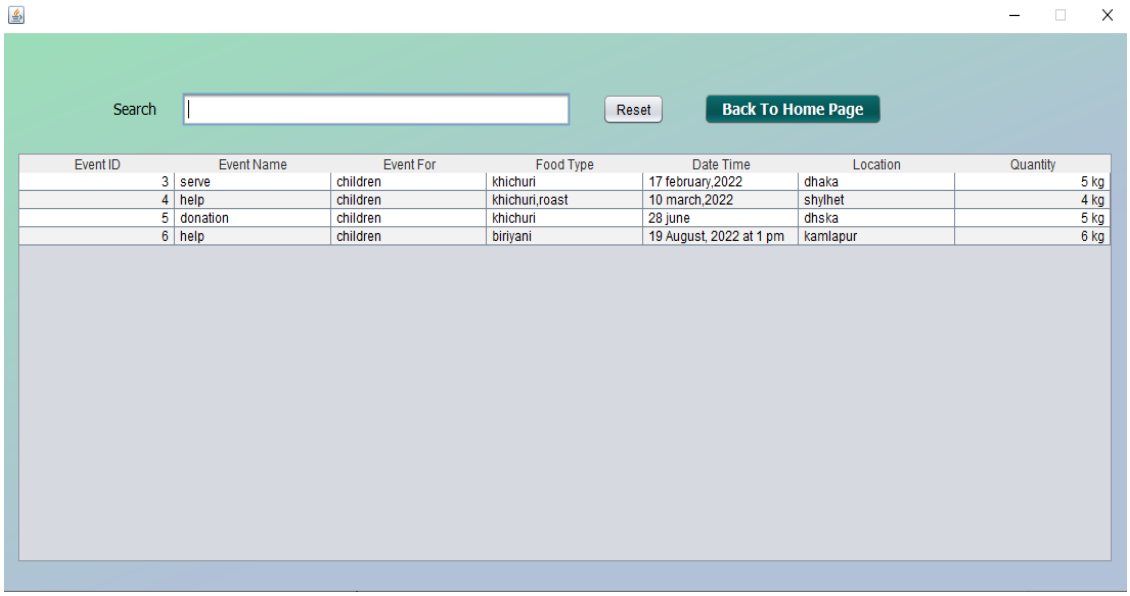
  Here, by providing an Event ID and clicking on the "Get" button will be able to see the amount of wasted food at a particular event.



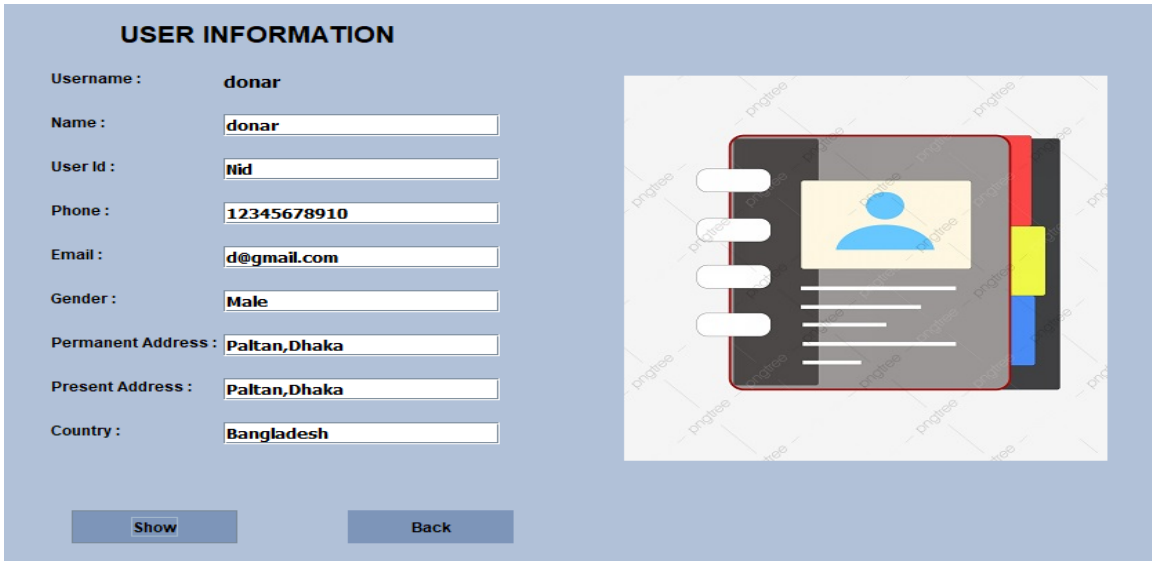
- **Add Remaining Food Information**:
  Through this interface, donors will be able to add remaining food information of donation events.



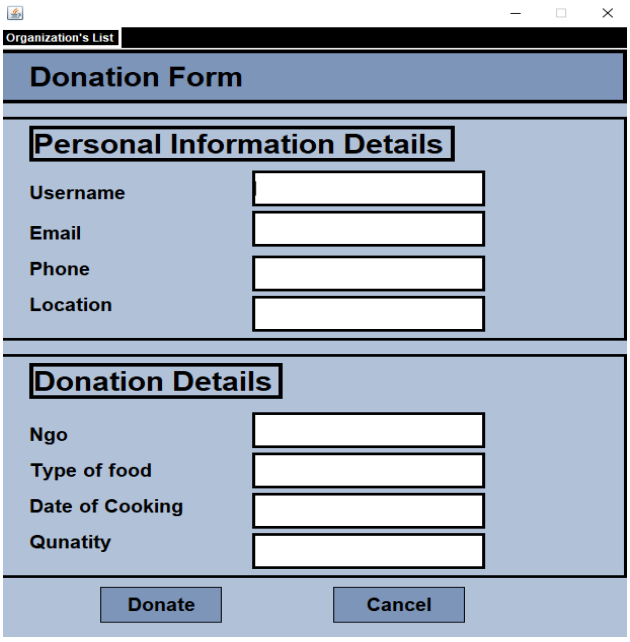
- **Event Information:**
  Here all events will be visible on a table form. The search button will allow the user to search for any user's input matching row for both upper and lower case letters. The reset button will empty the search box. The back to the home page button will redirect to the Donor Home page.



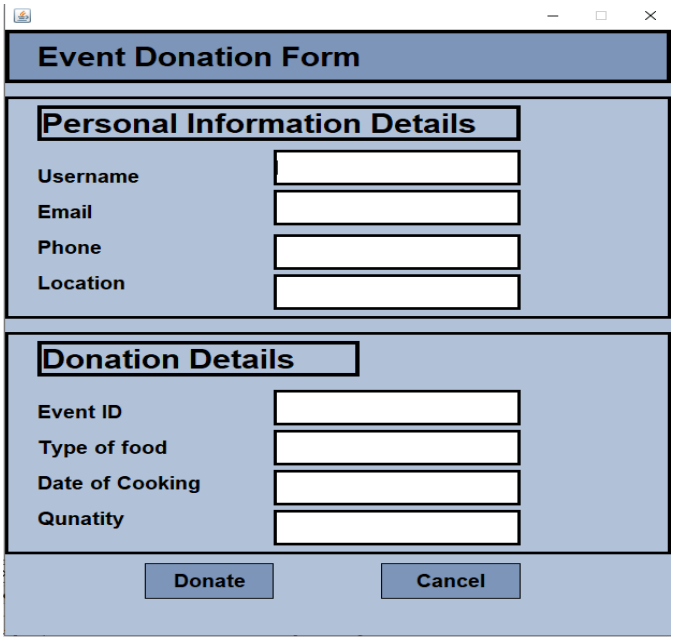
- **User Information:**
  The username will appear after entering this page from the donor dashboard's My Information button. After clicking on the Show button user will be able to see his all profile information which is saved on our software's database.



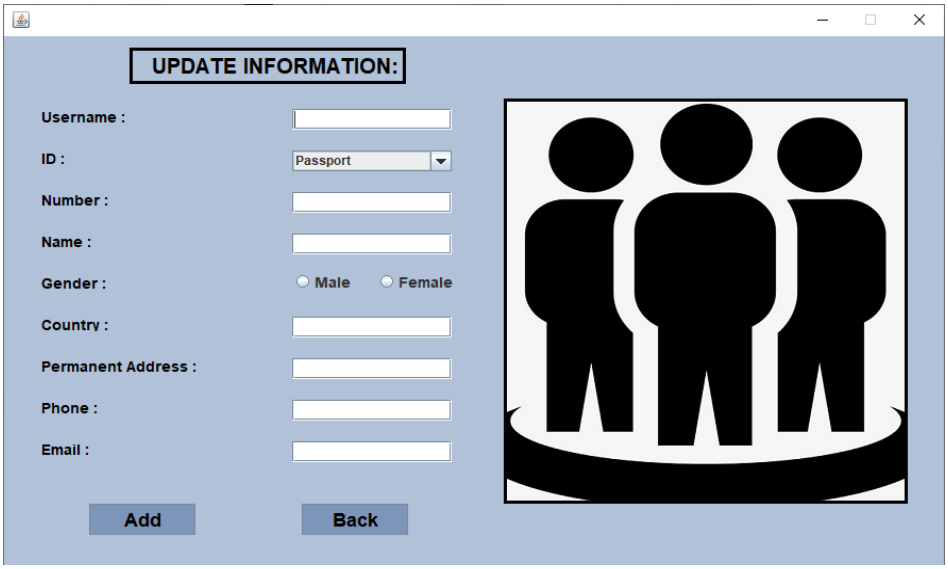
- **Specific Donation Form:**
  By filling up the form, users will be able to donate leftovers or any kind of food which meets the requirement of food safety guidelines about what food is acceptable to collect and disperse. Here all the options need to be filled in in order to submit the form and complete the donation process successfully.



- **Event Donation Form:**
  By filling up the form, users will be able to donate food to a donation event of any locality of our country which was created by the admin of this software. To donate to an event users need to fill up all the fields and click on donate button.



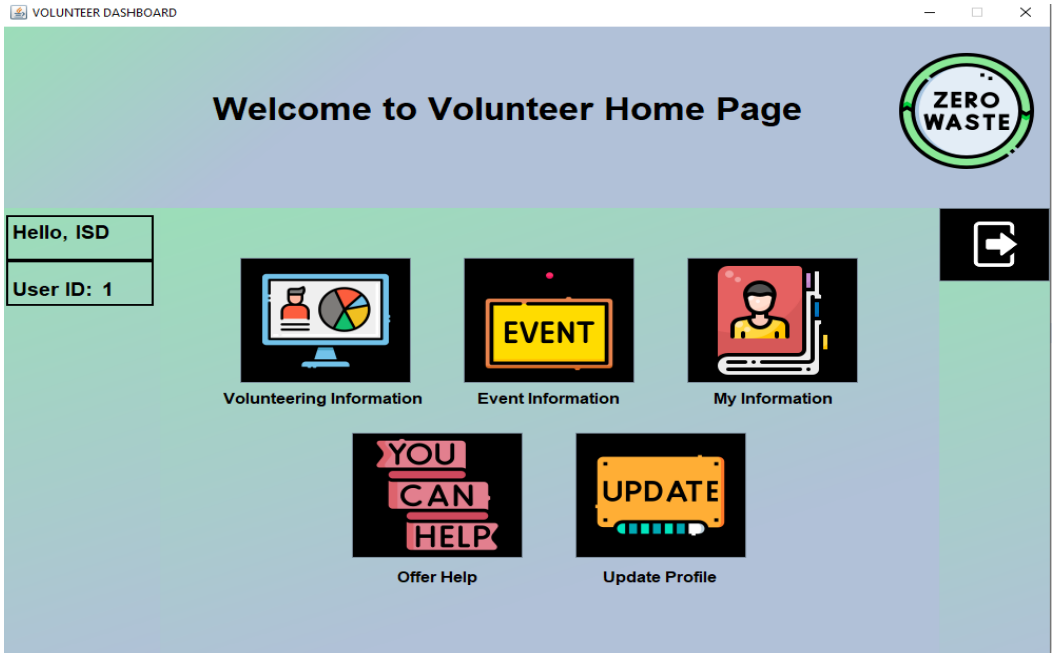
- **Update Profile:**
  By filling up all the fields and clicking on the add button the logged-in donor will be able to update his profile information for our software. The click on the back button will redirect to the donor's Home Page.



Volunteers' Side:

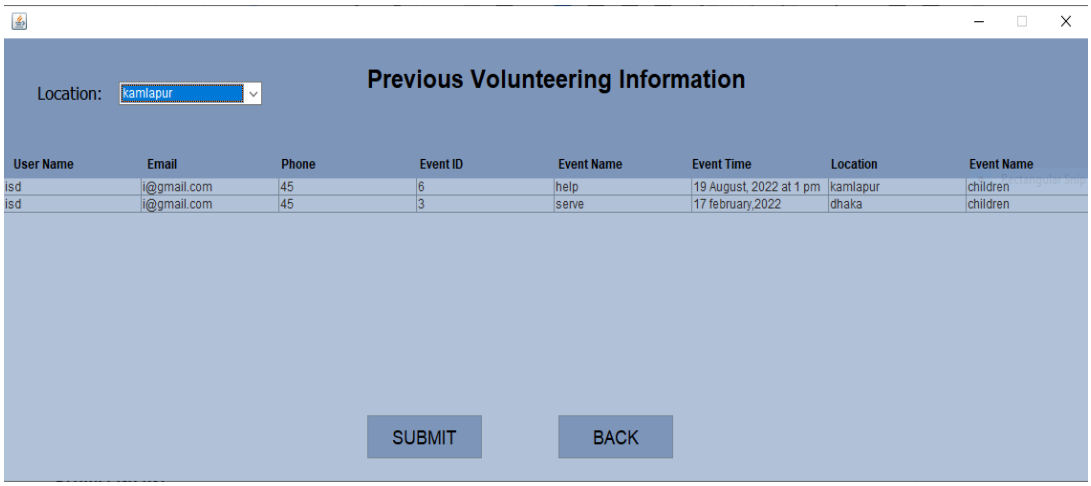
- **Volunteer Home Page:**

  If the user successfully login to our software as a volunteer then he will be redirected to the Volunteer Home page. Here user's username and id will be displayed on the leftmost pane and there is an exit button on the rightmost side of the panel.

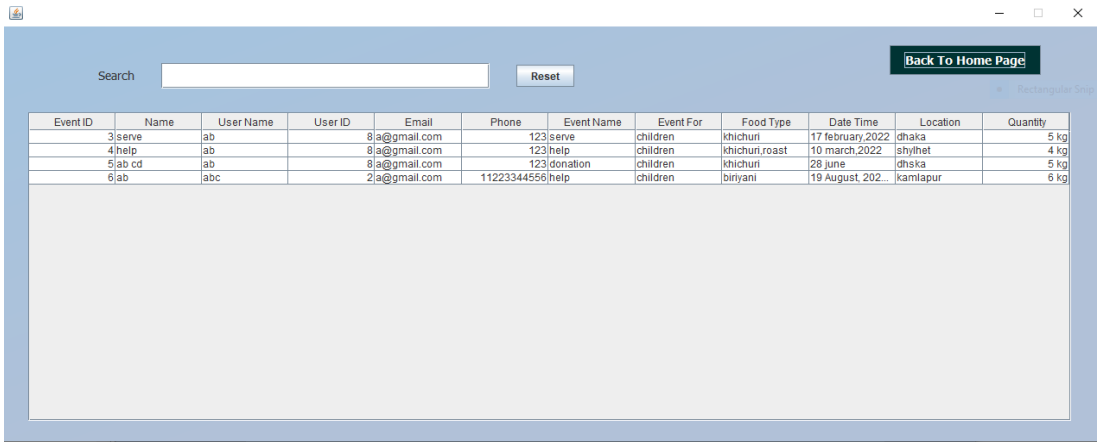


- **Volunteering Information:**

  By clicking on the dashboard's Volunteering information button the volunteer will be able to see Previous Volunteering Information on different events. By selecting the area on the drop-down list and clicking on the Submit button he will be able to see all volunteering information of his specified location.



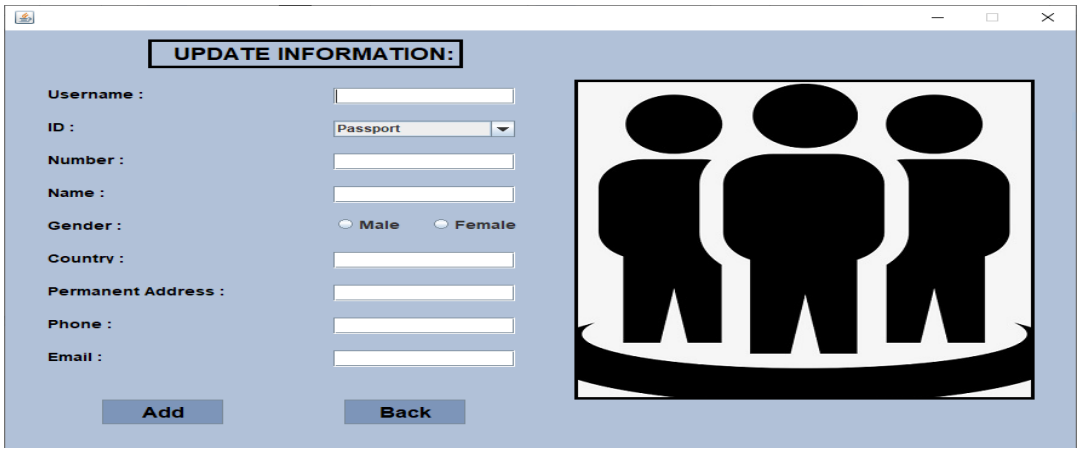
- **Event Information:**
  Here all events lists will be visible on a table form. The search button will allow the user to search for any user's input matching row for both upper and lower case letters. The reset button will empty the search box. The back-to-home page. The button will redirect to the Volunteer Home page.



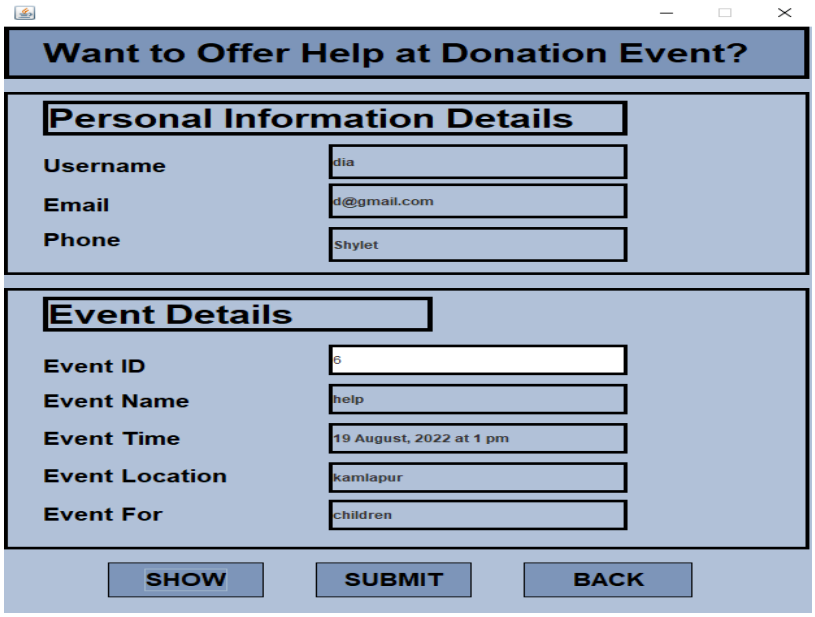
Event ID	Name	User Name	User ID	Email	Phone	Event Name	Event For	Food Type	Date Time	Location	Quantity
3	serve	ab	8	a@gmail.com	123	serve	children	khichuri	17 february,2022	dhaka	5 kg
4	help	ab	8	a@gmail.com	123	help	children	khichuri,roast	10 march,2022	shylhet	4 kg
5	ab cd	ab	8	a@gmail.com	123	donation	children	khichuri	28 june	dhska	5 kg
6	ab	abc	2	a@gmail.com	11223344556	help	children	biriyani	19 August, 202...	kamlapur	6 kg

- **Volunteer's Profile Information:**
  The username will appear after entering this page from the donor dashboard's My Information button. After clicking on the "Show" button the user will be able to see all his profile information which is saved on our software's database.

- **Update Profile:**
  By filling up all the fields and clicking on the add button the logged-in donor will be able to update his profile information for our software. The click on the back button will redirect to the donor's Home Page.



- **Offer Help:**
  By clicking on the home page's Offer Help button users will be directed to the volunteering application form. By Clicking on the form he will consent to offer volunteering service to his selected donation event. After entering this form his Profile information will be already fixed. This information will load from his profile information and by selecting the event id and clicking on the show button he will be able to show all the details before applying for volunteering. After clicking on the submit button he will be able to be a volunteer at his selected donation event to offer help to serve needy people.



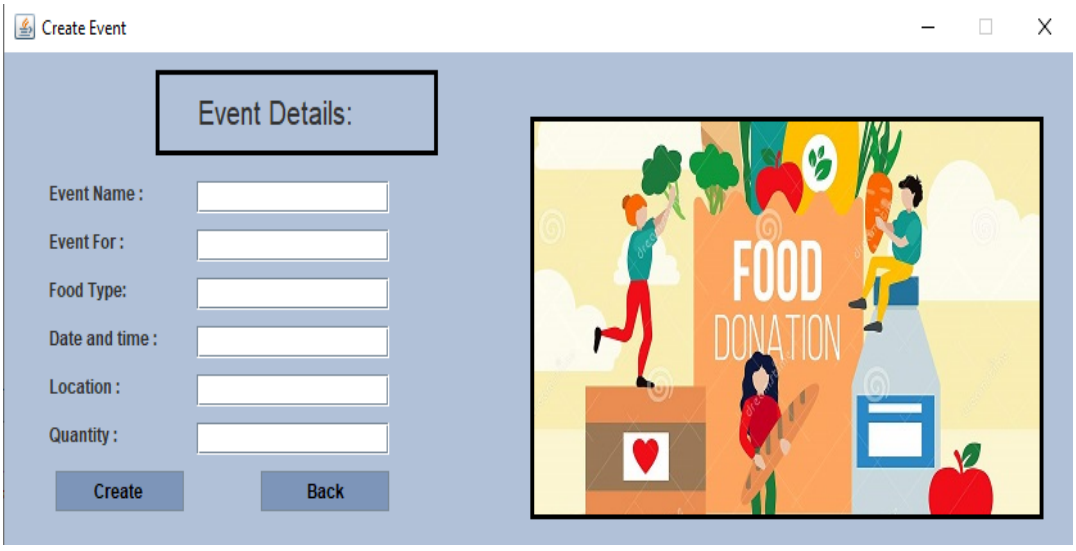
Admin's Side:

- **Admin Home Page:**

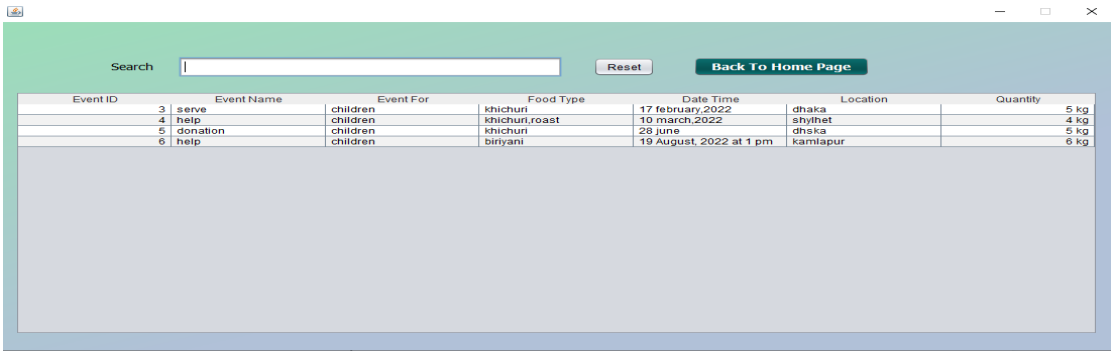
  If the Admin of this software login to this software then he will be directed to the Admin Home Page**.** Here the user's username and id will be displayed on the leftmost panel and there is an exit button on the rightmost side of the panel. Admin login information will be saved on the database explicitly. Admin doesn't need to register for this application.

- **Create Event:**

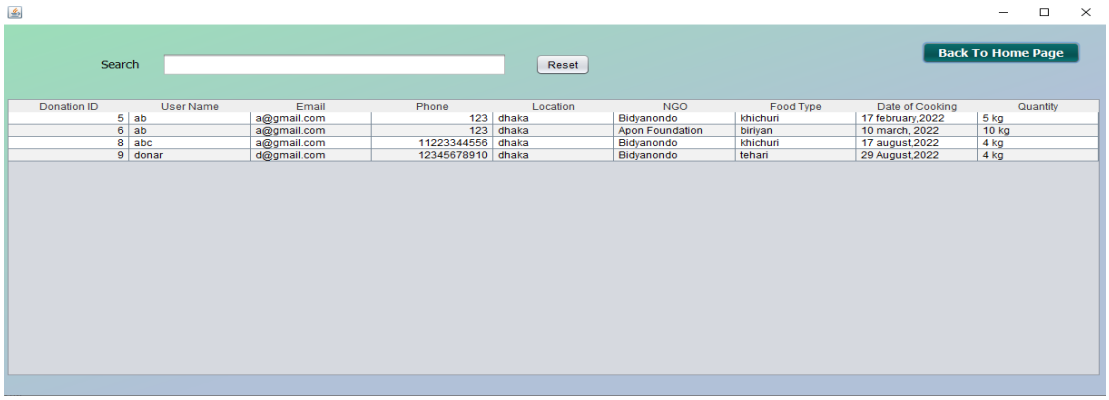
  Admin panel can create a food event, where users can donate food. For example, the event can be for a special day like 'The Independence Day Food Event' .



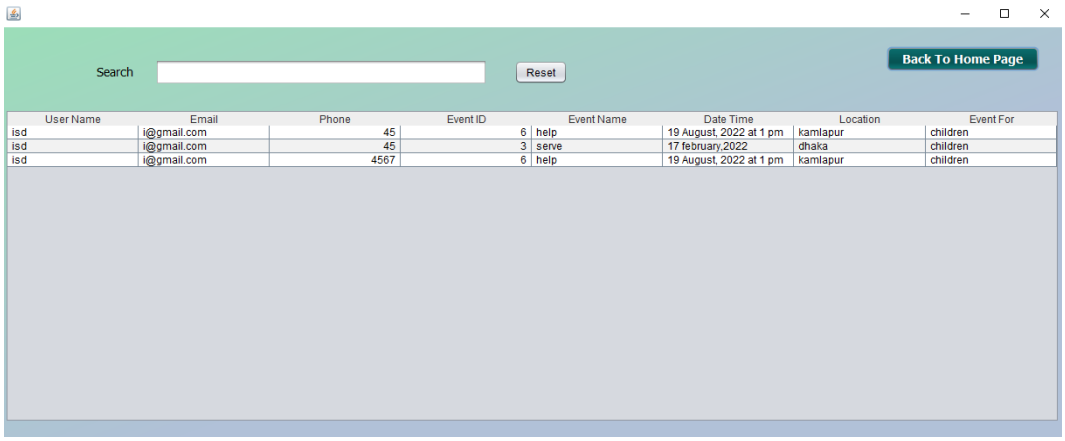
- **All Events Information:**
  On this page, Donors can search for any event and also can see all the event details.



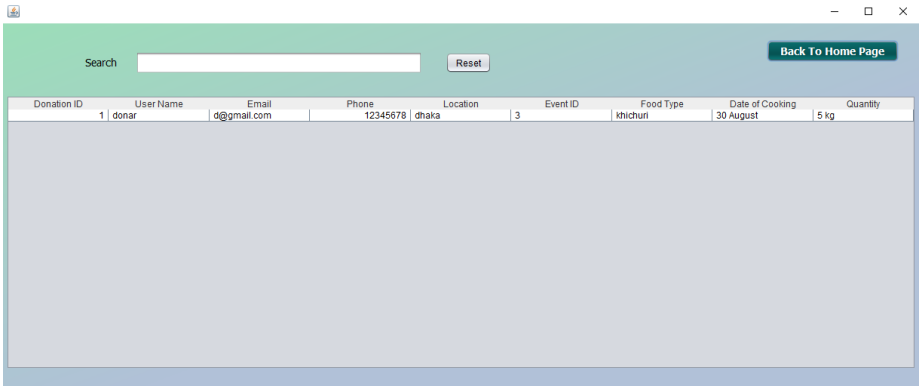
- **Specific Donation Information:**
  Admin can view the specific donation information of donors in a table.



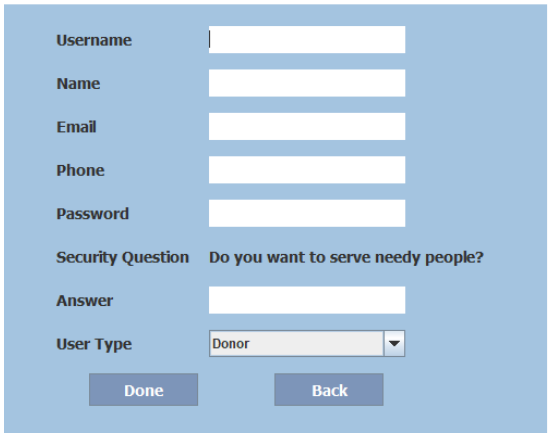
- **Volunteers' Application:**
  They can fill up a form for applying to this organization as a volunteer for any event. After applying for this as a volunteer, they can see the volunteer information table.

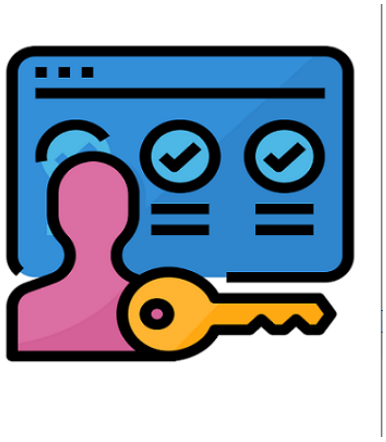


- **Event Donation information:**
  Admin can view the donations from donors in the events.



- **Add Volunteers:**
  Admin can add volunteers for the events.





Project Goals:

- ❖ Our motive behind creating this application is to help poor hungry people with food.
- ❖ Our goal is to make a user-friendly, feasible donation process for all walks of people.

To fulfill this criterion by making a food donation application goal of having
Features of the application are:

- ➢ Admin's Side - Different organizations and NGOs can buy our software to do their work.
  - ■ Admins can log in to the website. His information needed to be saved on the software's database explicitly.
  - ■ Admin will create food donation events to feed hungry people of different localities of our country.
  - ■ Admin will be able to search for specific events.
  - ■ Admin also will be able to see all donation requests and volunteering applications.

- ➢ Donors' Side - Restaurants, community centers, and other people will be our users for this project.
  - Donors will be able to log in, register, and recover their passwords.
  - The Donors will be able to view and update their profile information
  - The Donors will be able to donate food to events and also to the organization.
  - The Donors will be able to search for specific events.
  - The Donors will also be able to see their donation history of this software.
- ➢ Volunteers' Side - They will be able to help admin and donors collect food for ongoing events.
  - In Show prev volunteering info, volunteers can see all the volunteering information.
  - In Offer help, they can fill up a form for any event in which they want to be a volunteer.
  - In the Update Profile, they can update their information.
  - In Show Information, all the information about the volunteer will be shown.
  - In Search event, a volunteer can search for ongoing or upcoming events.

Used Technologies for the Project:

- NetBeans IDE 8.2
- Microsoft SQL Server Management Studio
- Mssql-JDBC-9.4.1.jre8.jar
- rs2xml.jar

Feasibility Analysis:

- **Technical**
  - Our software will be computer oriented.
  - We will use Java as the OOP language and SQL server database for all the datasets.
  - We have enough experts for developing the project.
  - Our software can be updated if needed.
- **Economical**
  - The Development & operating cost of our software will be within budget.
  - Our project can be completed within the deadline.
  - As our software has a low maintenance cost, extra profit could be gained by the NGOs who will run this software.
- **Operational**
  - Our software can be installed into different operating systems.

- It will be helpful for different NGOs to do their work.
- Our interface will be user-friendly.
- Anyone can use this software to donate food.

Requirement Analysis:

From Interviews and surveys from prospective clients and users who can be probable users of our software we came up with some criteria and features which will ease the process of food donation.

- For Admin Side:
  - Viewing All Donation Requests:
    This feature allows the admin to show all the donation requests in a list in the form of a table. This feature is very helpful in order to collect information about what amount, and type of food at which place. These features ease the process of donation-related management.
  - Viewing All Volunteer Application:
    This feature allows the admin to know all the information about who is wanting to be a volunteer at events of this software. This feature helps the admin to manage and divide work among volunteers before running the donation process smoothly.
  - Create Event:
    With this option, the admin will be able to create donation events at any locality to serve poor and hungry people. By this option, the admin will be able to inspire donors to donate food and also will be able to feed the needy which is the basic purpose of a food donation organization and also our application.
- For Donor Side:
  - Donation form to Organization:
    From the survey, it was found out that almost every person wastes some amount of food and also they want an easy and safe way to help the hungry people with uneaten foods. With this option, they will be able to donate their leftover food by simply filling up the donation form and handing that food to the organization.
  - Donation to Event Form: With this option, donors will be able to donate food to the Food Donation Events. This idea will definitely motivate people to donate food to unfortunate people and also inspire them not to waste food.
- For Volunteer Side:
  - Offer help: This option of our software will allow volunteers to offer help to donate food among people. By their service in managing the donation process and donating food, they will be able to help poor people.

Data Flow Diagrams:

Activities of the project:

- Donor's side-
    - Donors can register and log in.
    - They can search for events.
    - They can donate food to events.
    - They can also update their profile.
    - They can see all donation information
    - They can see all event lists
    - Donation to organization form

- Admin's side-
    - An admin can register and log in.
    - They can create events.
    - They can receive donations from users.
    - View event donation
    - Check all volunteering requests
    - Add volunteer
    - View separate donation

- Volunteer's side-
    - All volunteering information
    - All event information
    - Show profile information
    - Application to volunteering form
    - Update profile

Main Processes:

- Registration
- Log in
- Create event
- Search events
- Give donations
- Receive donations

Sub Processes:

- Authentication
- Give points
- Confirmation
- Update Profile
- Update events

- Delete events

External Entity Names:

- Donor
- Admin
- Volunteer

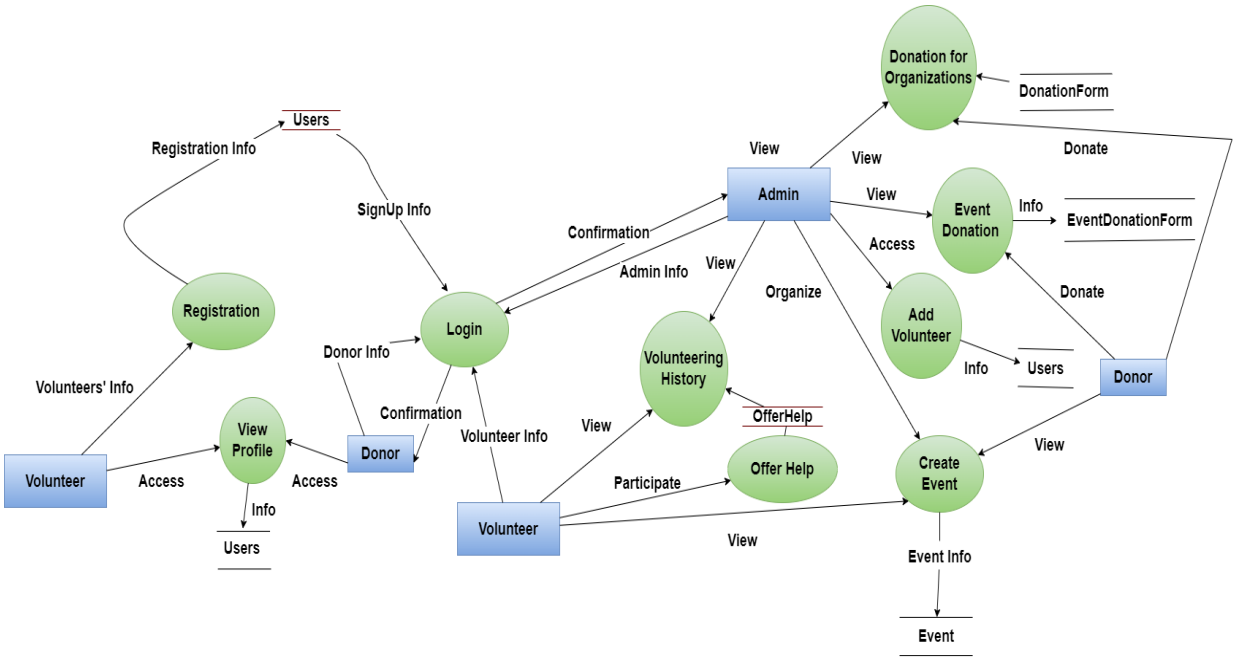
Database Names:

- Zero Waste

Context Level DFD:

In the context level Data Flow Diagram, we have three external entities- Donor, Admin and Volunteer. Here the donor will donate food and the admin will receive that donation. After that, they will send a donation confirmation message to the donor. Admin can create events and donors will search for those events and donate food to the events. Moreover, the admin will send points to the users who donate food so that we can mark the star donors. Those who donate more will get more points. Volunteers can help with any events that happen for the organization and they can help people by sending the donated food at the proper time and place.

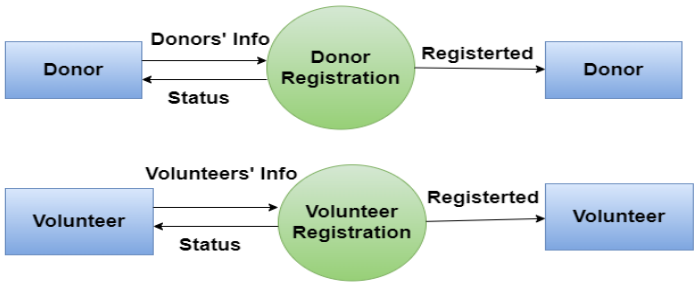
Level 0 DFD:



If we look at the level 0 DFD we will see different kinds of processes that are implemented inside this project. A donor can register themselves as a normal user. After registering, their information will be stored in the user database. Again, an admin can register by the registration process which will be authenticated. After registering, their information will be stored. Through login to their panel, a donor can have the interface of donating, and participating in an event where he can donate. A donor can also have the credits depending on what amount of food he is donating. In the Admin Panel, the admin can create a donation event and can receive donations from a donor by verification. Depending on the amount of donation, an organization can give credits to a user which will motivate others to donate. Volunteers can help with any event that happens in the organization and their helping information will be saved in the offer help table.

Level 1 DFD:

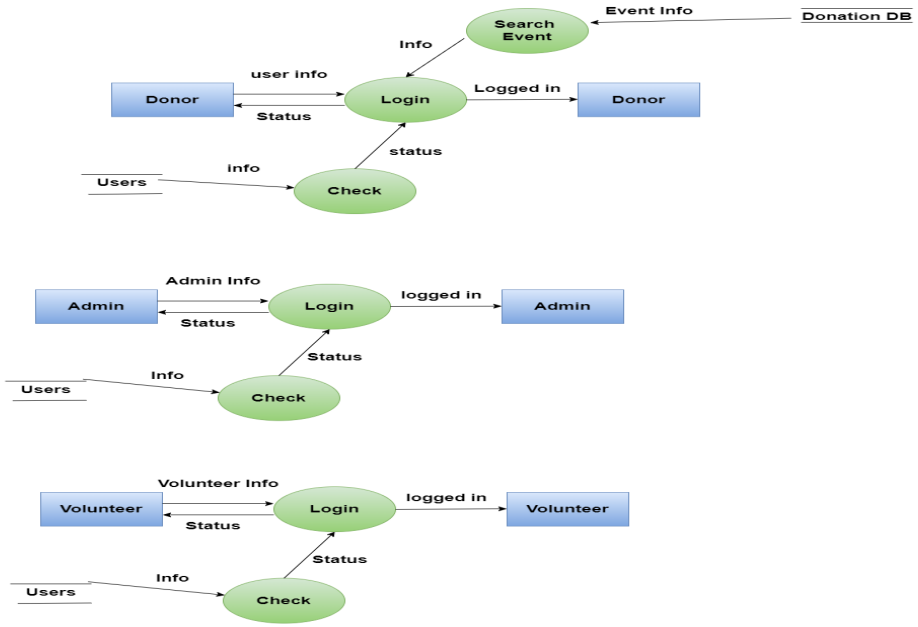
Registration Process:



Donors have to register for donations and they have to give proper information about themselves. After registration, they can donate food as a donor.

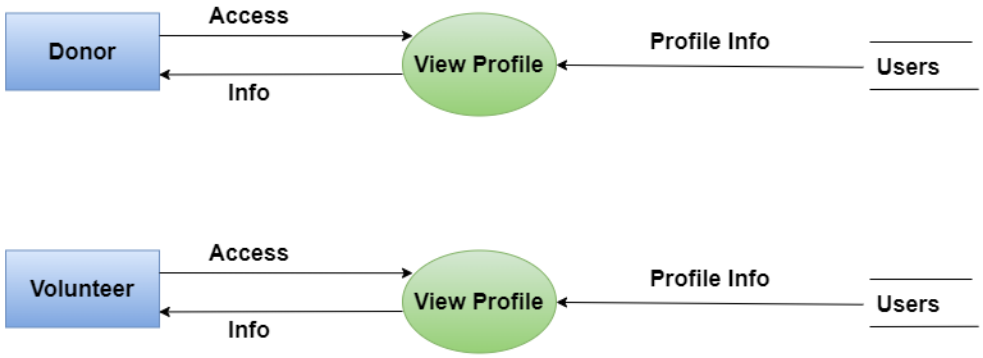
Volunteers have to register for volunteering and they have to give proper information about themselves. After registration, they can help as a volunteer.

Login Process:



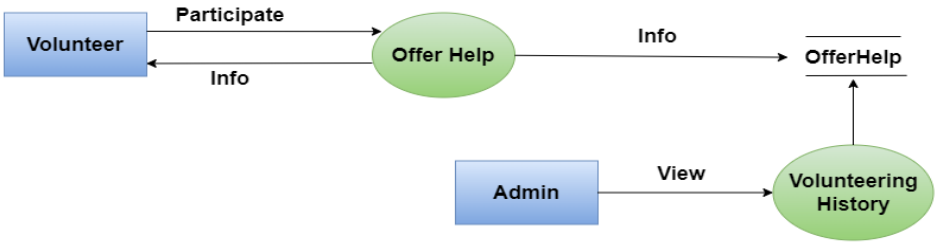
Registration can be done for both users and organizations. After login to their account, a user can have the facilities to update his current information, donate and search for an event by date.

View Profile:



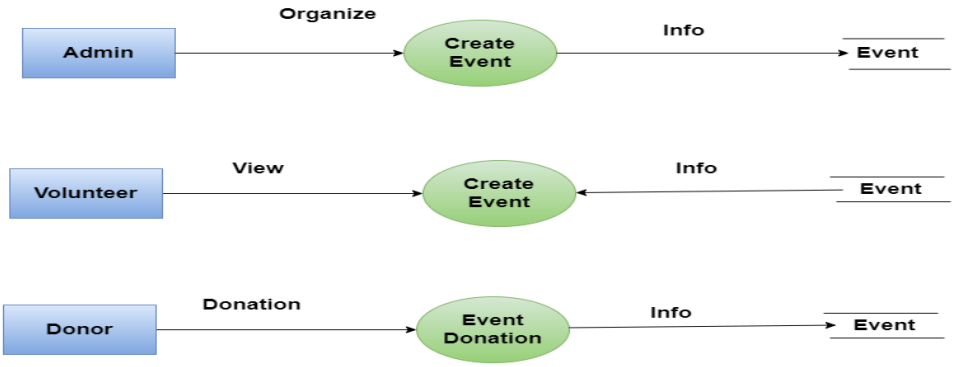
A user can donate to an organization which will be stored in the donation table of the software's database. And from the same table, an organization will be able to know all the details of the donors.

Offer Help:



Volunteers can offer help to the organization and the admin can allow them to help for donations. Volunteers can check the volunteering information and previous history6 of volunteering.

Create Event and Donation:



An organization can create an event as well as delete or update an event. All the events' information will be stored in the event database. From this database, information will be passed to the interface of the user. From there, users can know about the event, the organizer, and much more information.

Use Case Diagram:

Actors:

There will be 3 actors who will use this software. They are-

- ★ Donor
- ★ Admin
- ★ Volunteer

Use Cases:

There are some use cases on the Use Case Diagram of our project. These are

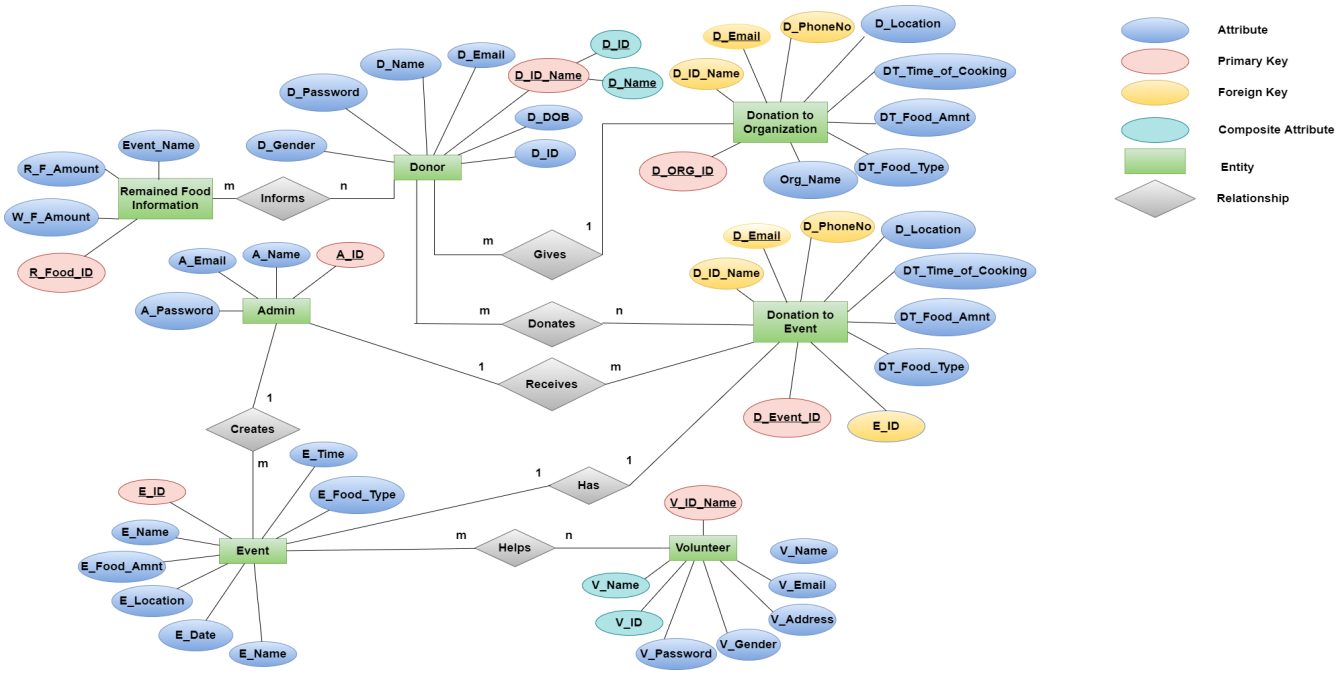
- **Log in:** Admin, Volunteer, and Donor will be able to log in to use this software's features.
- **Registration:** Volunteers and Donors will be able to register themselves on this application.
- **Give Donation to Event:** Donar will be able to donate food to donation events.
- **Give Donation to Organization:** Donar will be able to donate food to the organization.
- **Search Events:** Donar, Admin, and Volunteer will be able to search ongoing and upcoming donation events.
- **Update Profile:** Donor and Volunteer will be able to update their Profile Information

- **View Profile:** Donor and Volunteer will be able to view their Profile Information
- **Verify Password:** Whenever a user attempts to log in toan this software their information will go through the verification process.
- **Display Login Error:** If provided Information is invalid then for login then log in error will be displayed.
- **Add Volunteer:** Admin will be able to add volunteers.
- **View Donation Information:** Admin will be able to view donation information.
- **Create Event:** Admin will be able to create food donation events for any locality of our country where there are hungry people.
- **View Volunteering History:** Admin and Volunteer both can view the Volunteering history of this software.
- **Apply For Volunteering:** Volunteers will be able to apply for volunteering at donation events.

Entity Relation Diagram:

Entity Names, Attributes, and Data Type:

There are several numbers of entities on our project. The entities with their attributes and data types are specified below:



- **Donor:**
  - **D_ID_Name:** The datatype of the donor's ID will be an integer. This data will be auto-incremented. It is the primary key of the donor table.
  - **D_DOB:** The data type here will be a date.
  - **D_Email:** The datatype of this attribute will be varchar and the entered data

type will need to be matched with the first of the email.
    - **D_PhoneNo:** The data type will be an integer.
    - **D_Name:** The data type will be varchar.
    - **D_Password:** Here the data type will be varchar.
    - **D_Gender:** The data type will be varchar.

- **Admin:**
    - **A_ID:** The data type for this primary key of the admin table will be an integer and it will be an auto-incremented value.
    - **A_Email:** The data type of this attribute will be varchar and must be matched with the format of the email.
    - **A_Name:** The data type here will be varchar.
    - **A_Password:** The data type will be varchar.
- **Volunteer:**
    - **V_ID_Name:** R_ID is the primary key of the restaurant table holding integer data type. It will be an auto-incremented value.
    - **V_Email:** Here the data type will be varchar and it must be matched with the format of the email.
    - **V_Name:** Here the data type will be varchar and it must be matched with the format of the email.
    - **V_Address:** The data type here will be varchar and it can hold a maximum of 50 characters.
    - **V_Name:** The data type here also will be varchar and it can hold a maximum of 50 characters.
    - **V_Password:** Its datatype type will be varchar.

- **Donation to Organization:**
    - **DT_ID:** It will be the primary key of the donation table and here the data type will be an integer. Its value will be auto-incremented with the number of donations.
    - **D_ID:** It is a foreign key from the donor's table. It's a data type of auto-incremented integer. This attribute will help to track which donation is of which donors.
    - **DT_Food_Amnt:** Its datatype will be varchar. It will be able to hold a maximum of 20 characters.

- **Donation to Event:**
    - **DT_ID:** It will be the primary key of the donation table and here the data type will be an integer. Its value will be auto-incremented with the number of donations.
    - **D_ID:** It is a foreign key from the donor's table. It's a data type of auto-incremented integers. This attribute will help to track which donation is of which donors.
    - **DT_Food_Amnt:** Its datatype will be varchar. It will be able to hold a maximum of 20 characters.
    - **E_ID:** It is the foreign key of this table having integer data type.

- **Event:**
    - **E_ID:** It is the primary key of the Event table having integer data type. Its value will be auto-incremented with the number of events.
    - **E_Name**: Its data type will be varchar. This attribute will be able to hold a maximum of 50 characters.
    - **E_Food_Type:** Its data type will be an integer. This attribute will be able to hold around 20 characters.
    - **E_Location:** Its data type will be varchar.
    - **E_Date:** Its data type will be the date.
    - **E_Name:** Its data type will be varchar and it will be able to take a maximum of 50 characters as inputs.

- **Remained food Information:**
    - **E_Name:** Its data type will be varchar and it will be able to take a maximum of 50 characters as inputs.
    - **R_F_Amount:** Its data type will be varchar and it will be able to take a maximum of 50 characters as inputs.
    - **W_F_Amount:** Its data type will be varchar and it will be able to take a maximum of 50 characters as inputs.

Relationship Among Entity Sets:

The relationship between entity tables and the attributes of our project's database is given below:

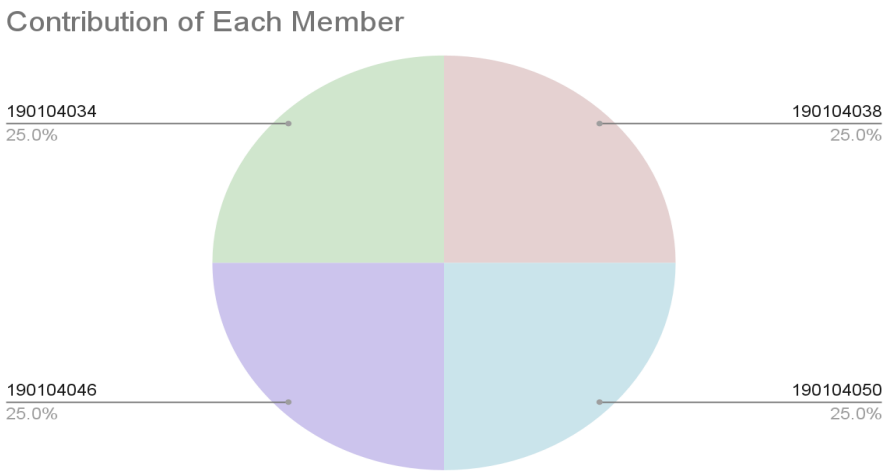
- Donates
    - Between donor & event
- Creates
    - Between admin & event
- Receives
    - Between admin & donation
- Gives
    - Between donor & donation to organization
- Informs
    - Between donor & remained food information
- Helps
    - Between volunteer & event
- Has
    - Between volunteer & event

Opportunities of Developments:

Developers can develop this software in future. They can add multiple processes and new features according to the client's wishes and future benefits. Developers can implement a Chat System between Admin, Donor, and Volunteer. They can implement a rating system and review system for donors and volunteers. They can add a payment system like nagad, brash, and rocket for cash donations for any event.

Contribution:

In this project, each member of our group contributed much. The percentage of contribution of each member is 25%.



Software testing:

Software testing is the process of executing a software system to determine whether it matches its specification and executes in its intended environment. There are so many ways for testing any software like Alpha testing, Beta testing, GUI testing, Gorilla testing, Monkey testing, Black box testing, etc.

To ensure that our software fulfills its all criteria and its quality is up to mark we have executed some software technique mechanisms. These executed mechanisms are:

- **Alpha Testing:** We have checked several times to ensure that all pages are correctly implemented or not. In this checking process, We have found many errors like fixing the error box message, fixing the size and alignment of the interface, making some fields non-editable, and many more.
- **Beta Testing:** We have also implemented beta testing by checking our software from the prospective client of our software to ensure that it meets all the criteria which a food donation software will need.
- **Graphical User Interface(GUI) testing:** We have also performed GUI testing by matching finished interfaces with the makeup and panned interfaces.
- **Gorilla Testing:** In this testing phase we checked some modules like on the “Offer Help” page we put the value and click on submit button again and again with different valid and invalid inputs to ensure that this module is compatible with errant data.
- **Monkey Testing:** On this testing, we tried to run this application very randomly like trying to go from one page to another without filling or submitting the form, sometimes entering a very large input to the text field, clicking on buttons without any reason. On this testing after some time our projects started to react slowly.
- **Black Box Testing:** Finally, we executed black box testing to ensure that the database connection throughout the whole project is up to the requirement.

Conclusion:

In Bangladesh, thousands of people sleep without food who are really unfortunate to get food and cause diseases like starvation, malnutrition, etc. So, we will try our best to provide free food to poor and homeless needy people. We will also try to make this application user-friendly. We hope this initiative will help to make our country hunger-free.