AMERICAN INTERNATIONAL UNIVERSITY–BANGLADESH (AIUB)

Dept. of Computer Science
Faculty of Science and Technology

CSC2210: OBJECT ORIENTED PROGRAMMING 2

Spring 2024-2025

Section: [w]

Group No: 05

Project Report On

INVENTORY MANAGEMENT SYSTEM

Supervised By

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CO2: Display and verify the mean of a real-life Project using the concepts of C# Graphical User Interface based environment with database integration to depict a desktop-based application.

Assessment Criteria	Not Attended/ Incorrect (0)	Inadequate (1-2)	Average (3)	Good (4)	Excellent (5)
Evaluation Criteria	**Evaluation Definition**				**Total =**
Requirement fulfillment	Properly demonstrate a real-life scenario-based project with proper functional requirement identification for the Object-Oriented Programming project development activities.				
Validation	Ensuring the ability of students' proper demonstration on validation forms in their system in terms of dealing with the data.				
Verification	Identifying if the students can verify the system data along with proper functional requirements in terms of data flow.				

Chapter :01 (Introduction)

The **Inventory Management System** is designed to streamline the management and tracking of products within a business through a digital platform. It serves as an interactive system for administrators, cashiers, and customers, enabling them to manage inventory, process sales, and place orders efficiently. The system ensures secure user authentication, organized product and category handling, and smooth transaction processing to enhance operational efficiency and accuracy.

Chapter :02(User Story)

1. Admin Features

Module	Functionality
1. Dashboard	View overall system status and statistics.
2. User Management	Add, update, or deactivate users.
3. Category Management	Add, update, or delete product categories.
4. Product Management	Add new products and manage existing product details.
5. Customer Management	View customer records and transaction summaries.
6. Donation Records	View and manage all donation entries.

2. Cashier Features

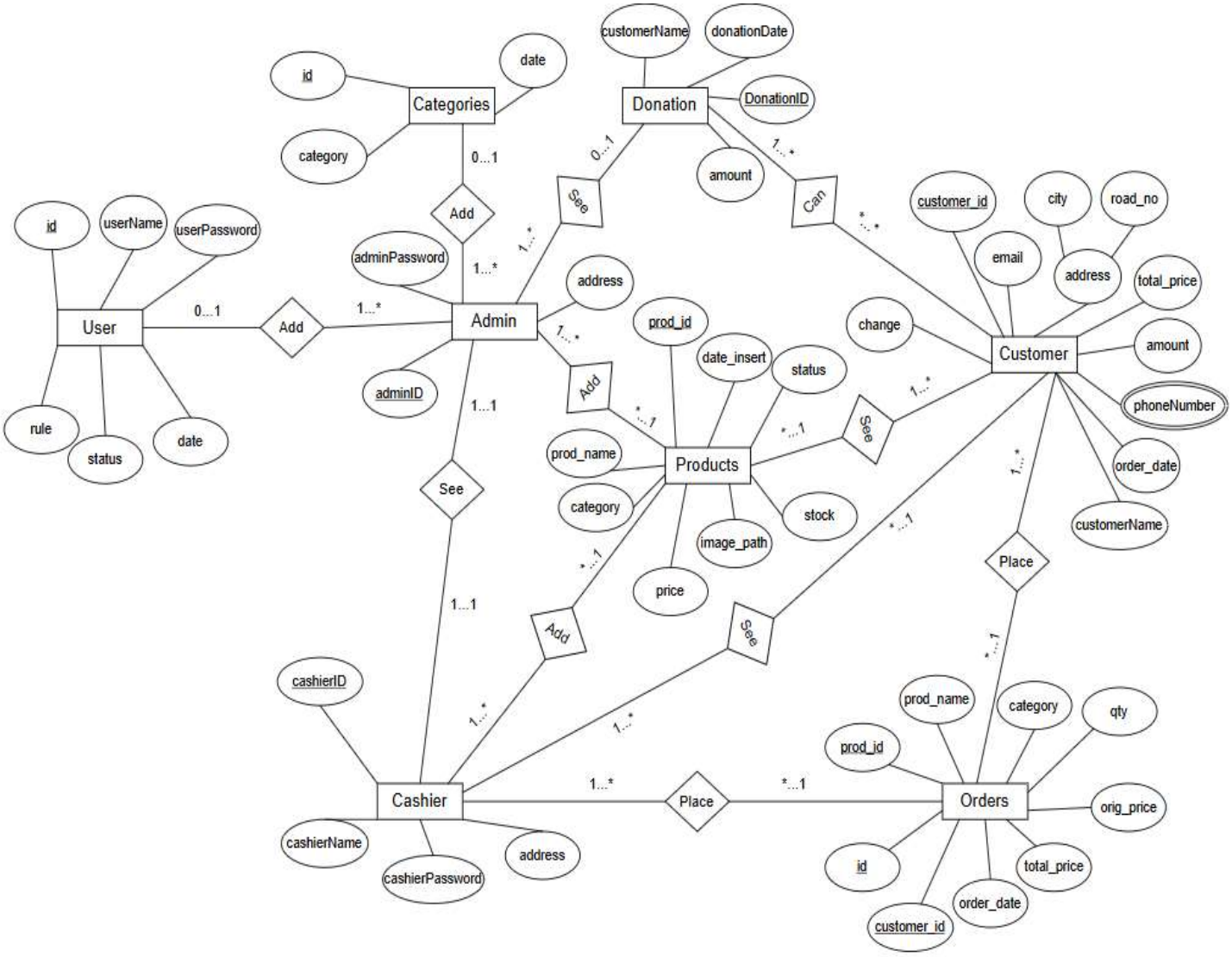
Module	Functionality
1. Dashboard	View sales summary and stock alerts.
2. Product Management	Add or update product information and stock.
3. Order Management	Place and manage customer orders.
4. Customer Overview	View customer transactions and balances.

3. Customer Features

Module	Functionality
1. Product View	Browse available products.
2. Order Placement	Select and order products.
3. Profile Management	Edit personal account information.
4. Donation	Make and view donations.

By integrating these features, the INVENTORY MANAGEMENT SYSTEM enhances efficiency, sustainability, and collaboration in this project.

Chapter :03 (ER Diagram)



NORMALIZATION

Add relation

UNF : adminID, adminPassword, address, id, username, userPassword, role, status, date
1NF : adminID, adminPassword, address, userID, username, userPassword, role, status, date

2NF :

1) adminID(PK), adminPassword, address
2) id(PK), username, userPassword, role, status, date
3) adminID(PK), id(FK)

3NF :

1) adminID(PK), adminPassword, address
2) id(PK), username, userPassword, role, status, date
3) adminID(PK), id(FK)

Add relation

UNF : adminID, adminPassword, address, id , category , date
1NF : adminID, adminPassword, address, id , category , date

2NF :

1) adminID(PK), adminPassword, address
2) id(PK), category , date
3) adminID(PK), id(FK)

3NF :

1) adminID(PK), adminPassword, address
2) id(PK), category , date
3) adminID(PK), id(FK)

See relation

UNF : adminID, adminPassword, address, DonationID, customerName, amount , donationDate
1NF : adminID, adminPassword, address, DonationID, customerName, amount , donationDate
2NF :

1) adminID(PK), adminPassword, address
2) DonationID(PK), customerName, amount , donationDate
3) adminID(PK), donationID(FK)

3NF :

1) adminID(PK), adminPassword, address
2) DonationID(PK), customerName, amount , donationDate
3) adminID(PK), DonationID(FK)

Add relation

UNF : adminID, adminPassword, address, prod_id, prod_name, category, price, stock, image_path, status, date_insert

1NF : adminID, adminPassword, address, prod_id, prod_name, category, price, stock, image_path, status, date_insert

2NF :

1) adminID(PK), adminPassword, address
2) prod_id(PK), prod_name, category, price, stock, image_path, status, date_insert
3) adminID(PK), productID(FK)

3NF :

1) adminID(PK), adminPassword, address
2) prod_id(PK), prod_name, category, price, stock, image_insert, status, date_insert
3) adminID(PK), prod_id(FK)

See relation : (admin,cashier)

UNF :

adminID, adminPassword, address, cashierID, cashierName, cashierPassword , address

1NF :

adminID, adminPassword, address, cashierID, cashierName, cashierPassword , address

2NF :

1) adminID(PK), adminPassword, address
2) cashierID(PK), cashierName, cashierPassword , address
3) adminID(PK), cashierID(FK)

3NF :

1) adminID(PK), adminPassword, address
2) cashierID(PK), cashierName, cashierPassword , address
3) adminID(PK), cashierID(FK)

Add relation

UNF : cashierID, cashierName, cashierPassword , address, prod_id, prod_name, category, price, stock, image_path, status, date_insert

1NF : cashierID, cashierName, cashierPassword , address, prod_id, prod_name, category, price, stock, image_path, status, date_insert

2NF :

1) cashierID(PK), cashierName, cashierPassword , address
2) prod_id(PK), prod_name, category, price, stock, image_path, status, date_insert
3) cashierID(PK), prod_id(FK)

3NF :

1) cashierID(PK), cashierName, cashierPassword , address
2) productID(PK), prod_name, category, price, stock, image_path, status, date_insert
3) cashierID(PK), prod_id(FK)

Place relation

UNF : cashierID, cashierName, cashierPassword , address, id , prod_id, prod_name, category, qty, orig_price, total_price, order_date, customer_id

1NF : cashierID, cashierName, cashierPassword , address, id , prod_id, prod_name, category, qty, orig_price, total_price, order_date, customer_id

2NF :

1) cashierID(PK), cashierName, cashierPassword , address
2) id(PK) , prod_id(PK), prod_name, category, qty, orig_price, total_price, order_date, customer_id(PK)
3) cashierID(PK), id(FK), prod_id(FK), customer_id(FK)

3NF :

1) cashierID(PK), cashierName, cashierPassword , address
2) id(PK) , prod_id(PK), prod_name, category, qty, orig_price, total_price, order_date, customer_id(PK)
3) cashierID(PK), id(FK), prod_id(FK), customer_id(Fk)

Place relation

UNF : customer_id, customerName, address ,city , road_no, email , total_price, amount, change, phoneNumber, id , prod_id, prod_name, category, qty, orig_price, total_price, order_date, customer_id

1NF : customer_id, customerName, address , city , road_no, email , total_price, amount, change, phoneNumber, id , prod_id, prod_name, category, qty, orig_price, total_price, order_date, customer_id

2NF :

1) customer_id(PK), customerName, city , road_no, email , total_price, amount,change, phoneNumber
2) id(PK) , prod_id(PK), prod_name, category, qty, orig_price, total_price, order_date, customer_id(PK)
3) customer_id(PK), id(FK), prod_id(FK), customer_id(FK)

3NF :

1) customer_id(PK), customerName, city , road_no, email , total_price, amount, change, phoneNumber
2) id(PK) , prod_id(PK), prod_name, category, qty, orig_price, total_price,order_date, customer_id(PK)
3) customer_id(PK), id(FK), prod_id(FK), customer_id(FK)

See relation

UNF :cashierID, cashierName, cashierPassword , address, customer_id, customerName, address, city , road_no, email , total_price, amount, change, phoneNumber

1NF : cashierID, cashierName, cashierPassword , address, customer_id, customerName, address, city , road_no, email , total_price, amount, change, phoneNumber

2NF :

1) cashierID(PK), cashierName, cashierPassword , address
2) customer_id(PK), customerName, city , road_no, email , total_price, amount, change, phoneNumber
3) cashierID(PK), customer_id(FK)

3NF :

1) cashierID(PK), cashierName, cashierPassword , address
2) customer_id(PK), customerName, city , road_no, email , total_price, amount, change, phoneNumber
3) cashierID(PK), customer_id(FK)

See relation

UNF : customer_id, customerName, address, city , road_no, email , total_price, amount, change, phoneNumber, prod_id, prod_name, category, price, stock, image_path, status, date_insert

1NF : customer_id, customerName, address, city , road_no, email , total_price, amount, change, phoneNumber, prod_id, prod_name, category, price, stock, image_path, status, date_insert

2NF :

1) customer_id(PK), customerName, city , road_no, email , total_price, amount, change, phoneNumber
2) prod_id(PK), prod_name, category, price, stock, image_path, status, date_insert
3) customer_id(PK), prod_id(FK)

3NF :

1) customer_id(PK), customerName, city , road_no, email , total_price, amount, change, phoneNumber
2) prod_id(PK), prod_name, category, price, stock, image_path, status, date_insert
3) customer_id(PK), prod_id(FK)

Can relation

UNF : customer_id, customerName, address, city , road_no, email , total_price, amount, change, phoneNumber, DonationID, amount , donationDate

1NF : customer_id, customerName, address, city , road_no, email , total_price, amount, change, phoneNumber, DonationID, amount , donationDate

2NF :

1) customer_id(PK), customerName, city , road_no, email , total_price, amount,change, phoneNumber
2) DonationID, amount , donationDate
3) customer_id(PK), DonationID(FK)

3NF :

1) customer_id(PK), customerName, city , road_no, email , total_price, amount, change, phoneNumber
2) DonationID, amount , donationDate
3) customer_id(PK), DonationID(FK)

Finalization :

1) adminID(PK), adminPassword, address
2) id(PK), username, userPassword, role, status, date
3) adminID(PK), id(FK)
4) id(PK), category , date
5) DonationID(PK), customerName, amount , donationDate
6) adminID(PK), DonationID(FK)
7) prod_id(PK), prod_name, category, price, stock, image_insert, status, date_insert
8) adminID(PK), prod_id(FK)
9) cashierID(PK), cashierName, cashierPassword , address
10) adminID(PK), cashierID(FK)
11) cashierID(PK), prod_id(FK)
12) id(PK) , prod_id(PK), prod_name, category, qty, orig_price, total_price, order_date, customer_id(PK)
13) cashierID(PK), id(FK), prod_id(FK), customer_id(FK)
14) customer_id(PK), customerName, city , road_no, email , total_price, amount, change, phoneNumber
15) cashierID(PK), customer_id(FK)
16) customer_id(PK), prod_id(FK)
17) DonationID, amount , donationDate
18) customer_id(PK), DonationID(FK)

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Chapter :03 (SQL Queries)

User table

```
CREATE TABLE users
(
    id INT PRIMARY KEY IDENTITY(1,1),
    username VARCHAR(MAX) NULL,
    password VARCHAR(MAX) NULL,
    role VARCHAR(MAX) NULL,
    status VARCHAR(MAX) NULL,
    date DATE NULL
);
```

Customer table

```
CREATE TABLE customer
(
    id INT PRIMARY KEY IDENTITY(1,1),
    customer_id INT NULL,
    total_price FLOAT NULL,
    amount FLOAT NULL,
    change FLOAT NULL,
    order_date DATE NULL,
    PaymentMethod NVARCHAR(50) NOT NULL,
);
```

Donations table

```
CREATE TABLE Donations (
    DonationID INT PRIMARY KEY IDENTITY(1,1),
    CustomerName NVARCHAR(100),
    PhoneNumber NVARCHAR(15),
    Amount DECIMAL(10, 2),
    DonationDate DATETIME DEFAULT GETDATE()
);
```

Categories table

```
CREATE TABLE categories
(
   id INT PRIMARY KEY IDENTITY(1,1),
   category VARCHAR(MAX) NULL,
   date DATE NULL
)
```

Products table

```
CREATE TABLE products (
    id INT PRIMARY KEY IDENTITY(1,1),
    prod_id VARCHAR(MAX) NULL,
    prod_name VARCHAR(MAX) NULL,
    category VARCHAR(MAX) NULL,
    price FLOAT NULL,
    stock INT NULL,
    image_path VARCHAR(MAX) NULL,
    status VARCHAR(MAX) NULL,
    date_insert DATE NOT NULL
);
```

Orders table

```
CREATE TABLE orders
(
   id INT PRIMARY KEY IDENTITY(1,1),
   prod_id VARCHAR(MAX) NULL,
   prod_name VARCHAR(MAX) NULL,
   category VARCHAR(MAX) NULL,
   qty INT NULL,
   orig_price FLOAT NULL,
   total_price FLOAT NULL,
   order_date DATE NULL,
   customer_id INT NOT NULL
);
```

TABLES

Column Name	Data Type	Allow Nulls
id	int	☐
username	varchar(MAX)	☑
password	varchar(MAX)	☑
role	varchar(MAX)	☑
status	varchar(MAX)	☑
date	date	☑
		☐

User Table

Column Name	Data Type	Allow Nulls
id	int	☐
prod_id	varchar(MAX)	☑
prod_name	varchar(MAX)	☑
category	varchar(MAX)	☑
price	float	☑
stock	int	☑
image_path	varchar(MAX)	☑
status	varchar(MAX)	☑
date_insert	date	☑
		☐

Products Table

Column Name	Data Type	Allow Nulls
id	int	☐
customer_id	int	☑
total_price	float	☑
amount	float	☑
change	float	☑
order_date	date	☑
PaymentMethod	nvarchar(50)	☑
		☐

Customer Table

Column Name	Data Type	Allow Nulls
DonationID	int	☐
CustomerName	nvarchar(100)	☑
PhoneNumber	nvarchar(15)	☑
Amount	decimal(10, 2)	☑
DonationDate	datetime	☑
		☐

Donations Table

Column Name	Data Type	Allow Nulls
id	int	☐
category	varchar(MAX)	☑
date	date	☑
		☐

Categories Table

Chapter:04 (Screenshots)

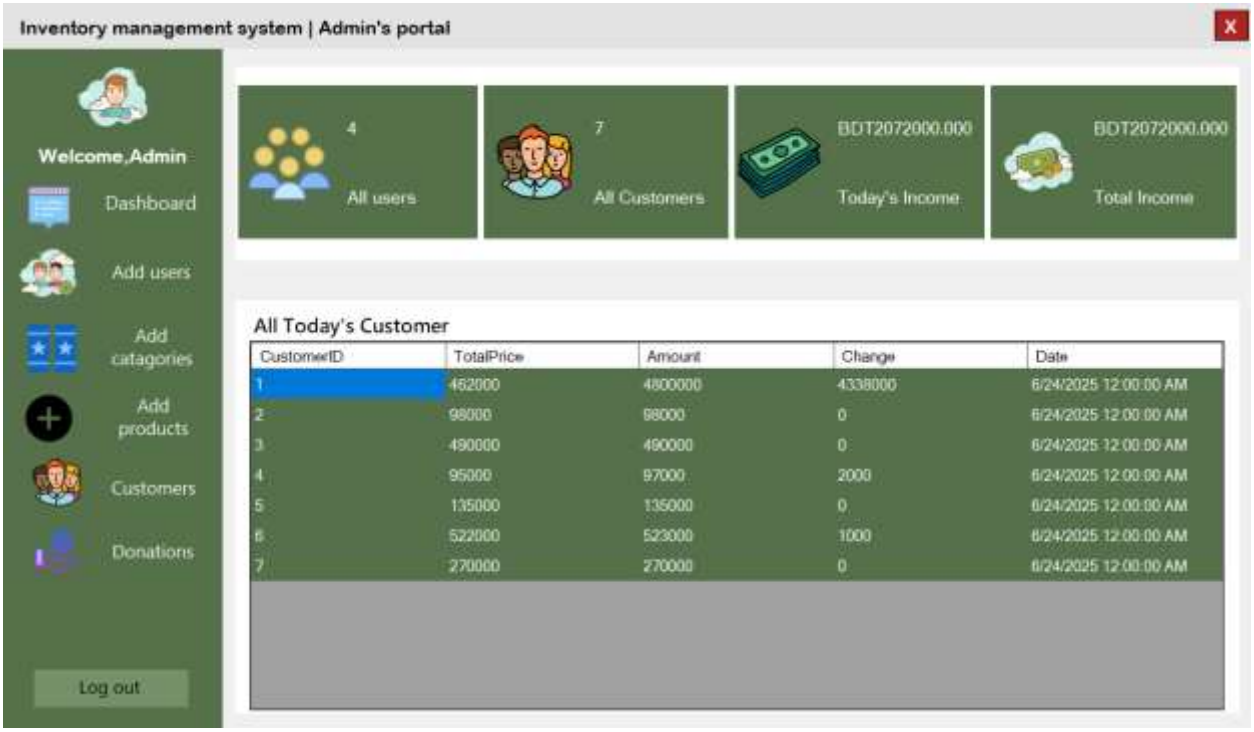


Fig.1: Features for ADMIN

Fig.2: Features for CASHIER

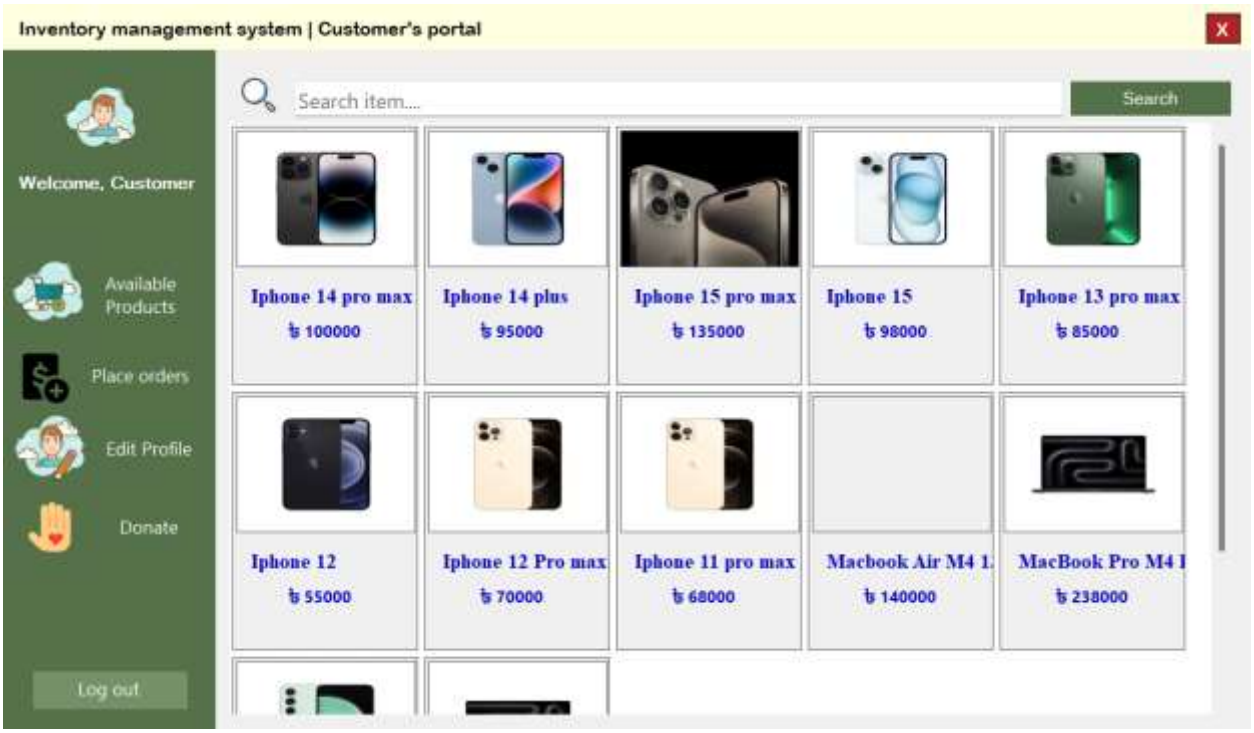


Fig.3: Features for CUSTOMER.

All FORMS

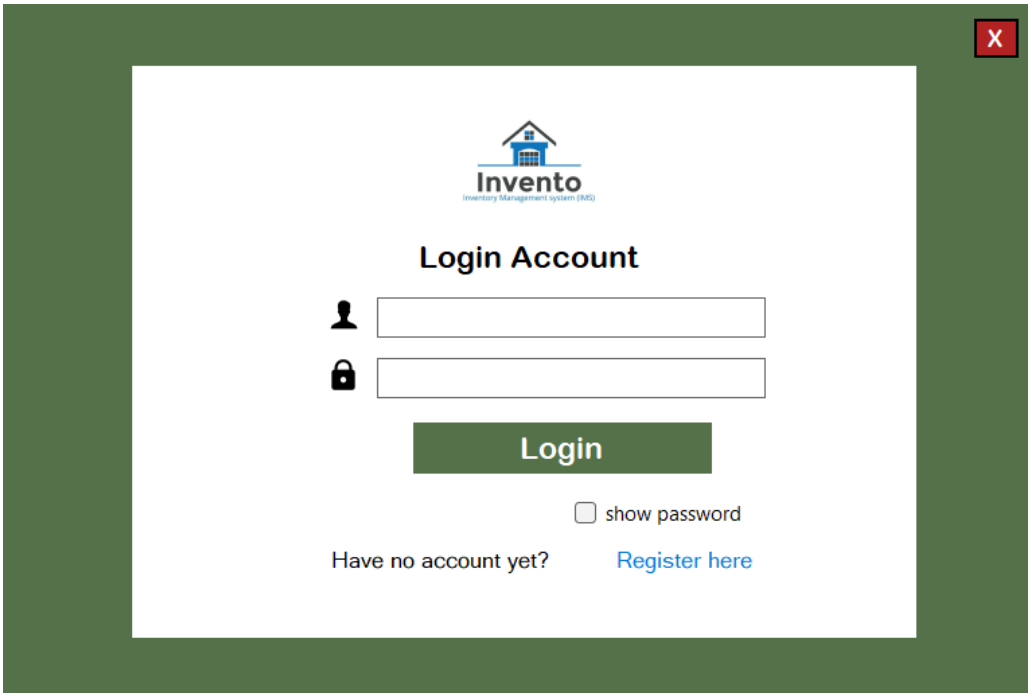


Fig.4: Login form

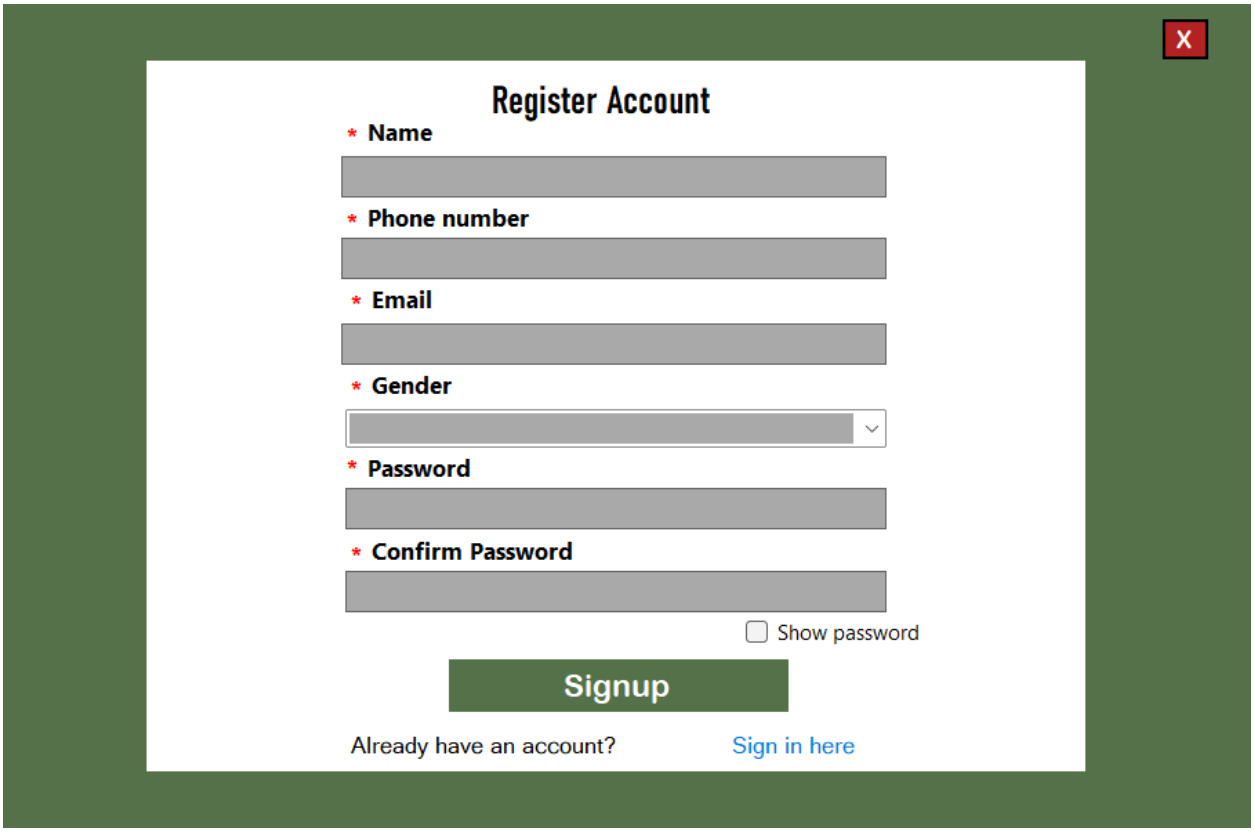


Fig.4: Register form

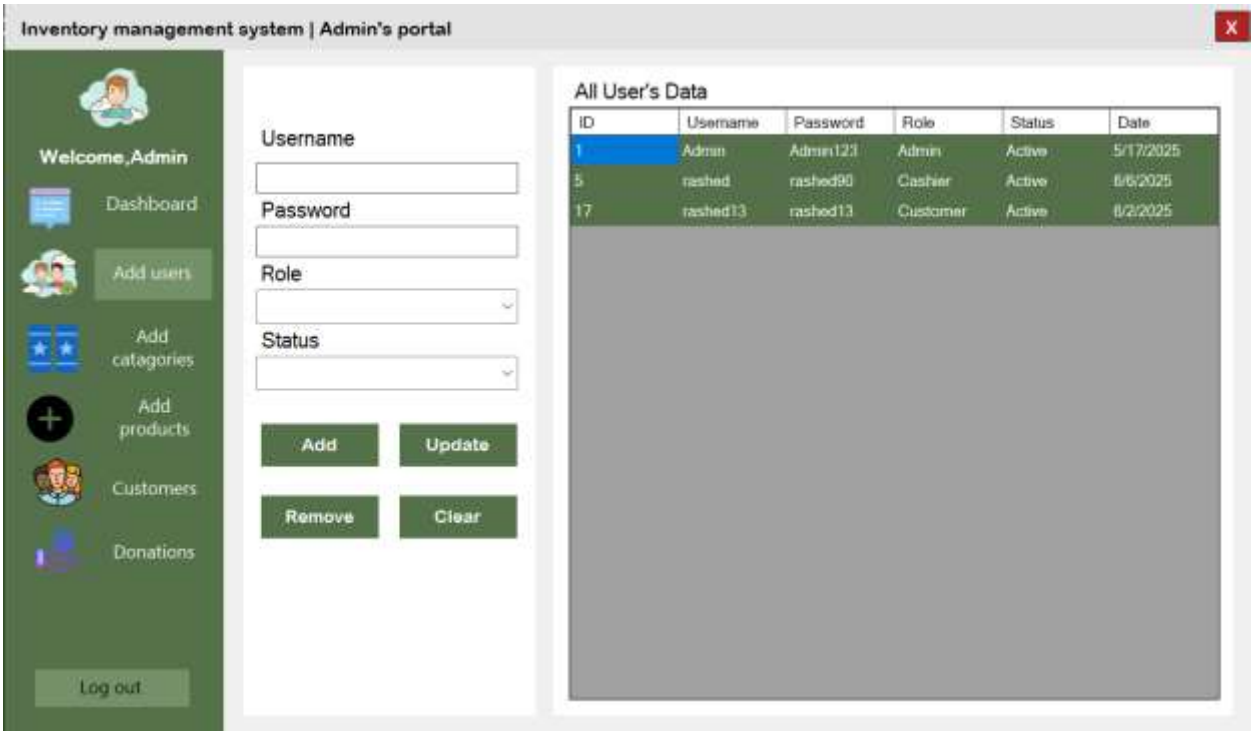


Fig.5: Admin add user form

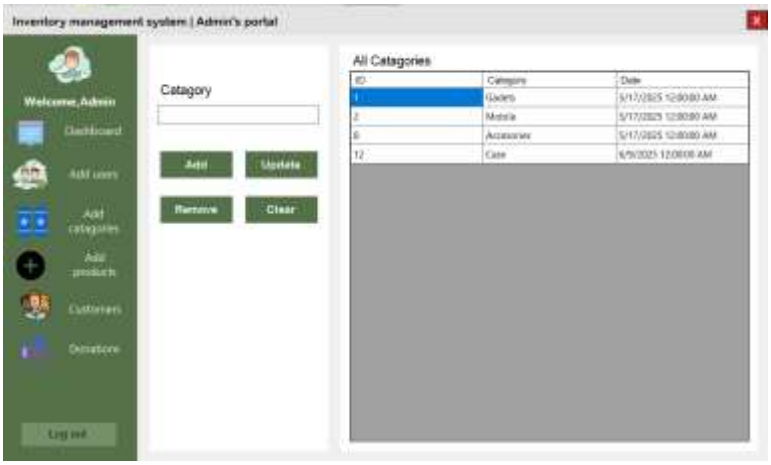


Fig.6 : Admin add categories Form

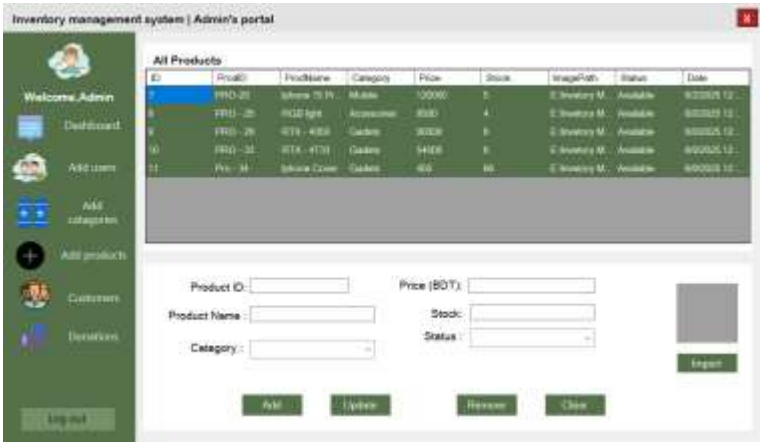


Fig.7 : Admin add Products Form

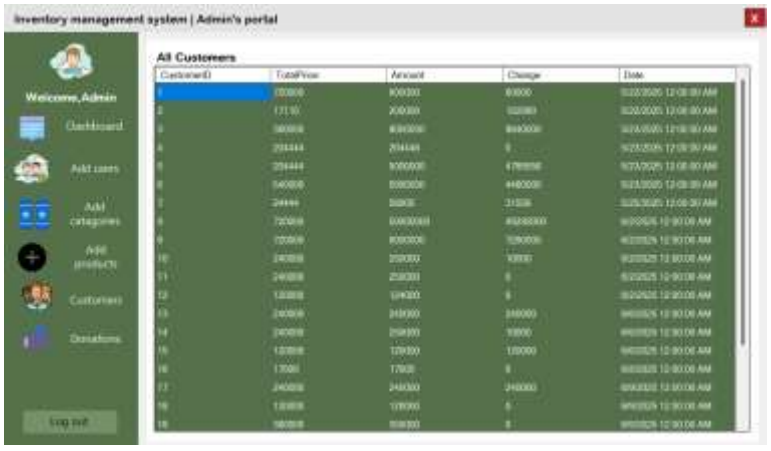


Fig.8 : All Customer Form

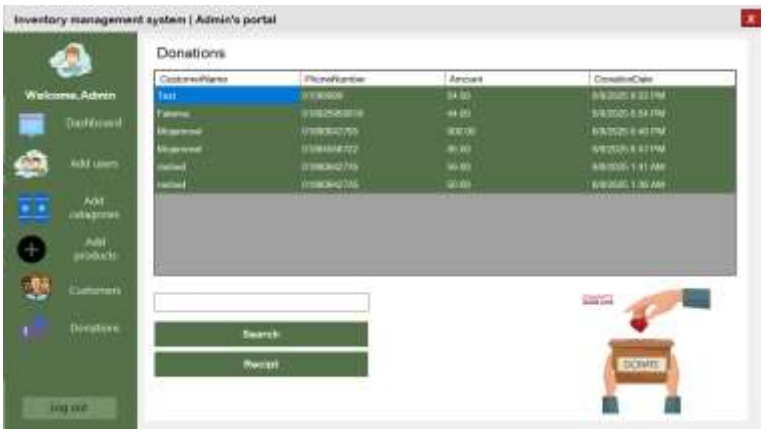


Fig.9 : All Donations Form

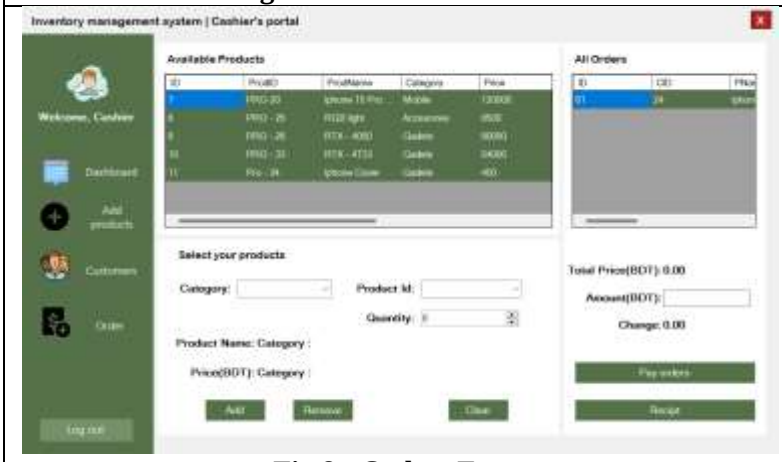


Fig.8 : Orders Form

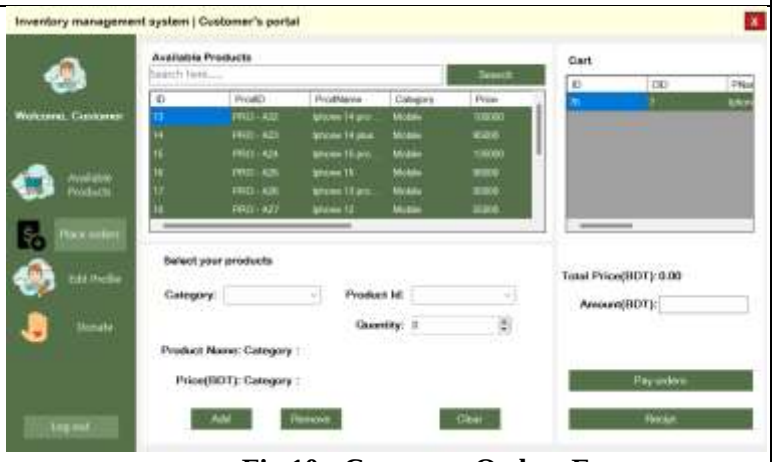


Fig.10 : Customer Orders Form

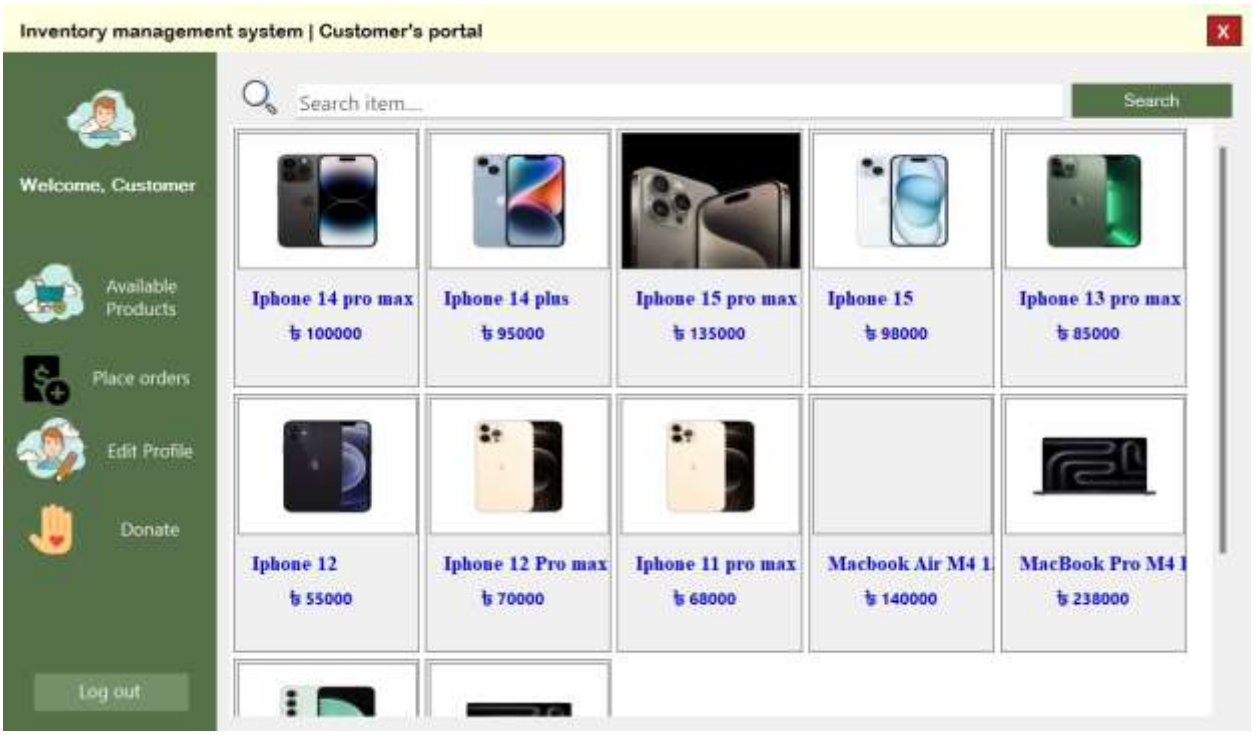


Fig.11 : Available products Form

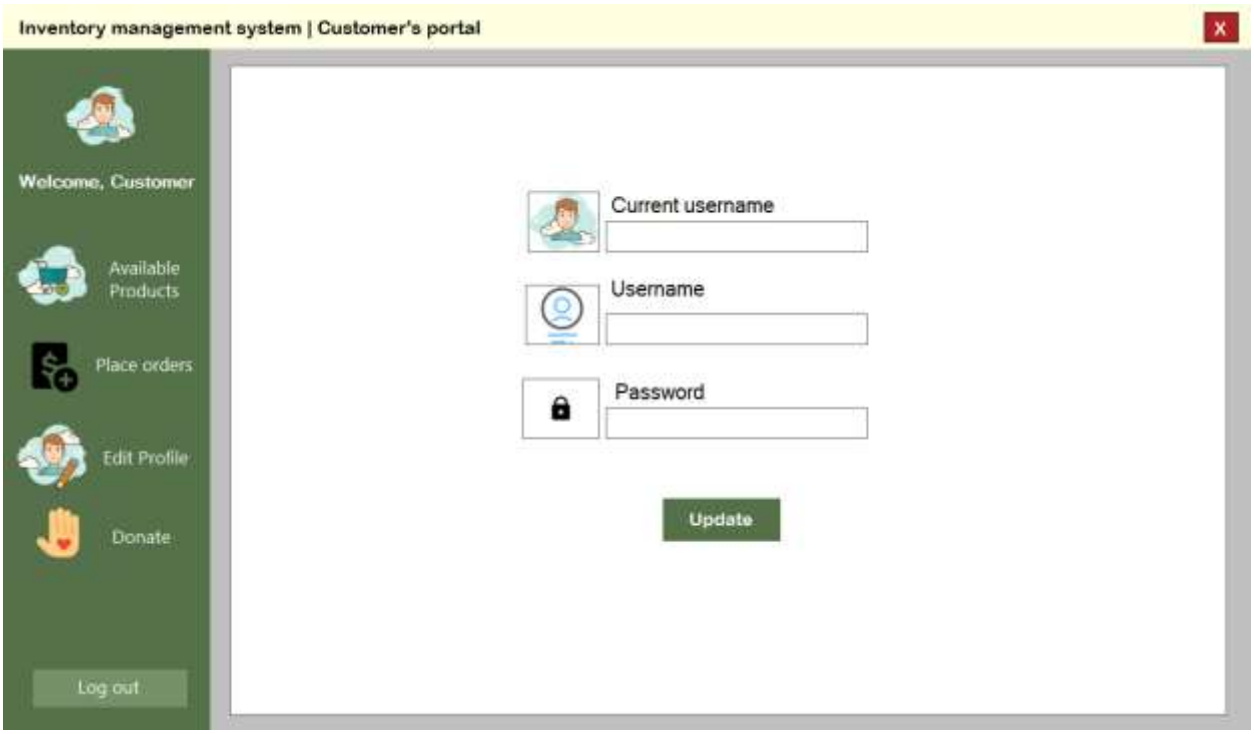


Fig.12 : Customer Edit profile Form

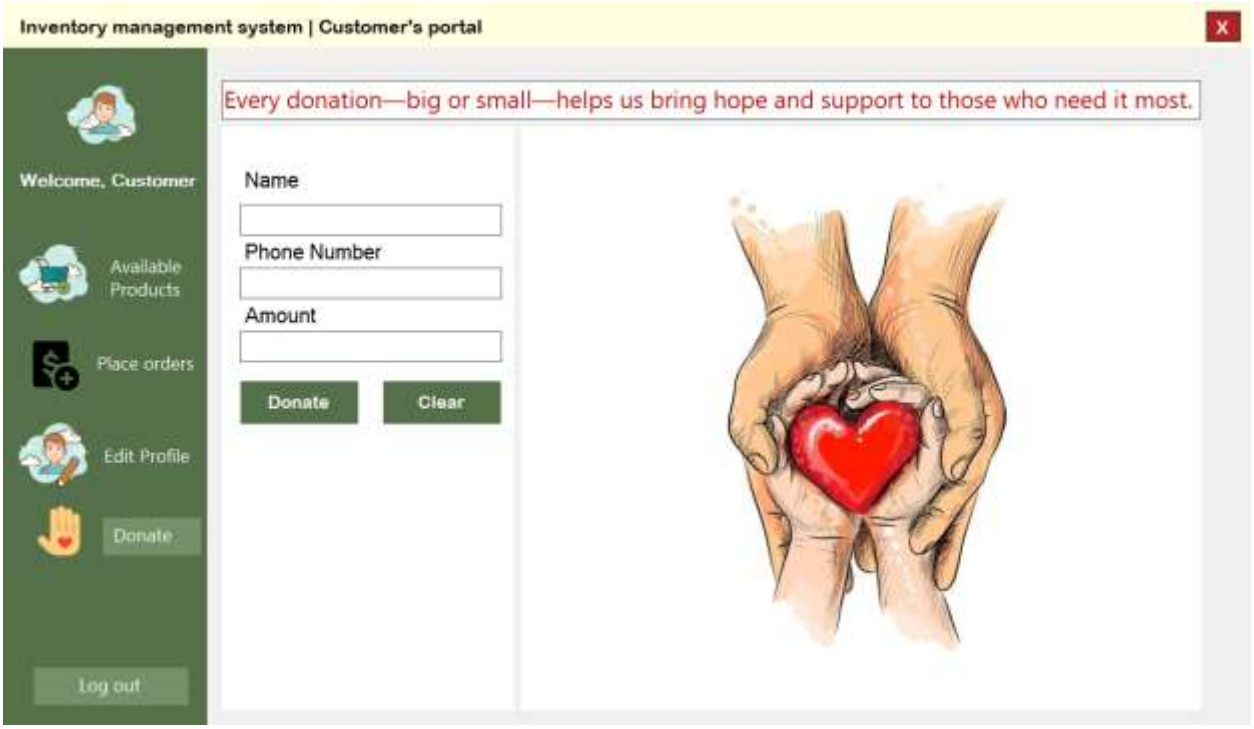
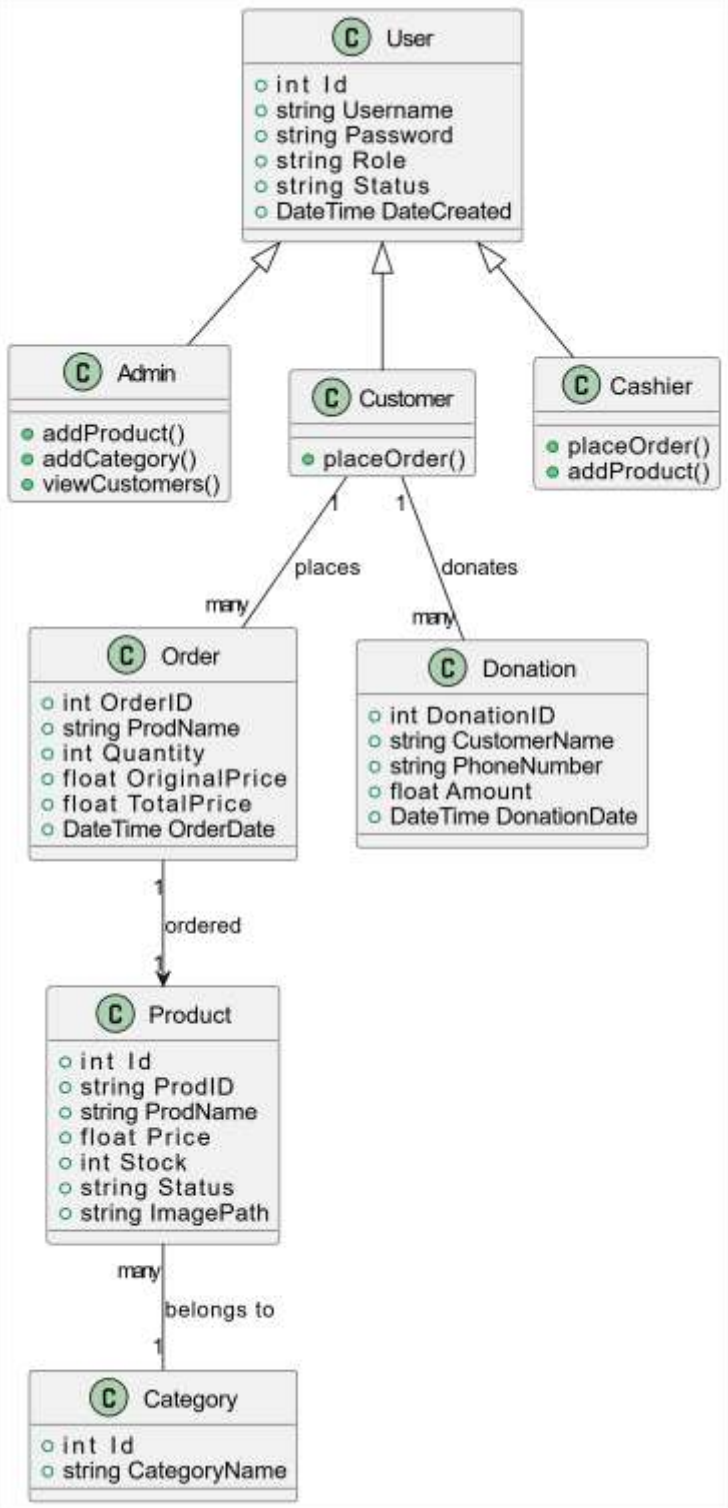
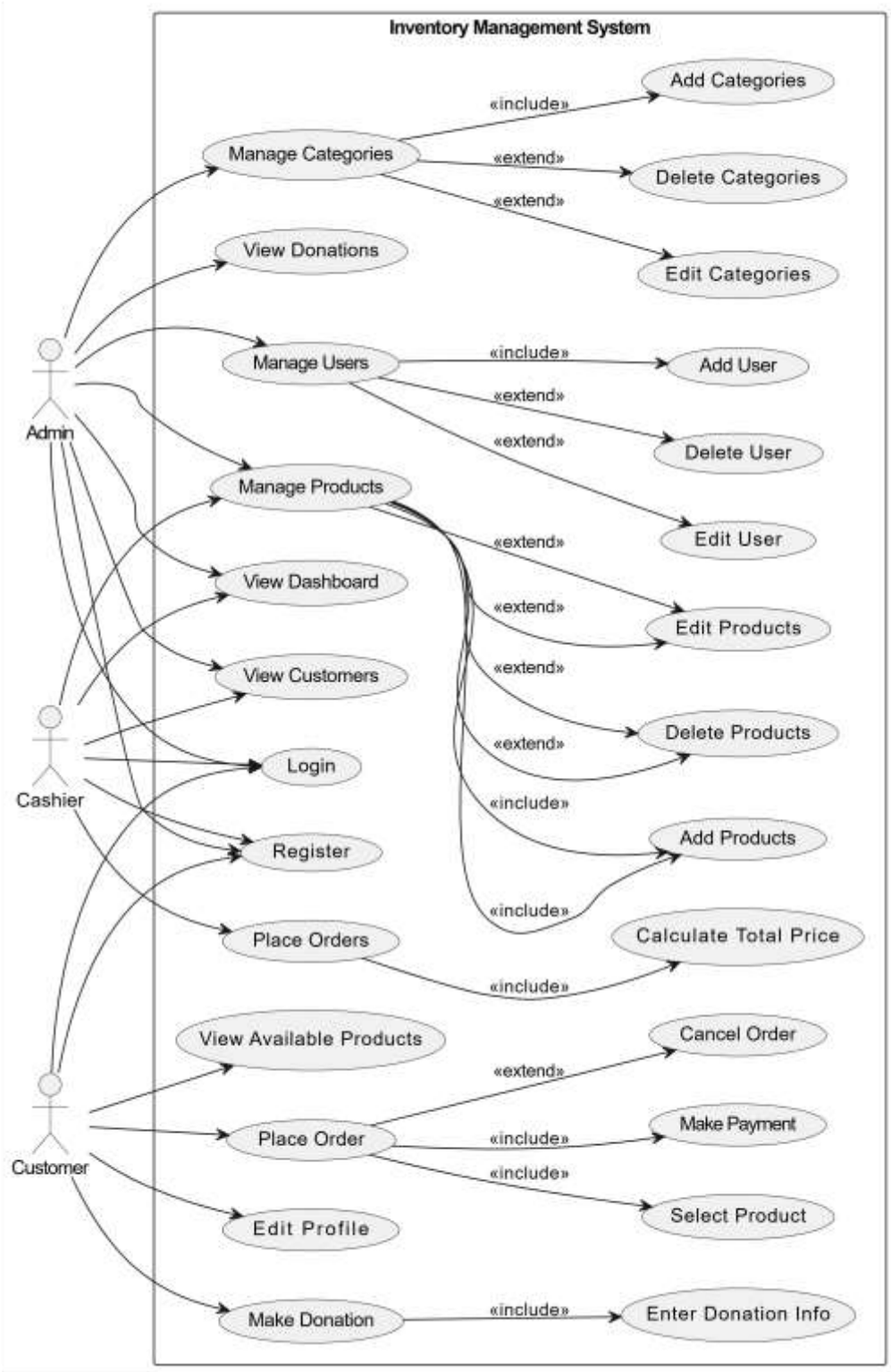
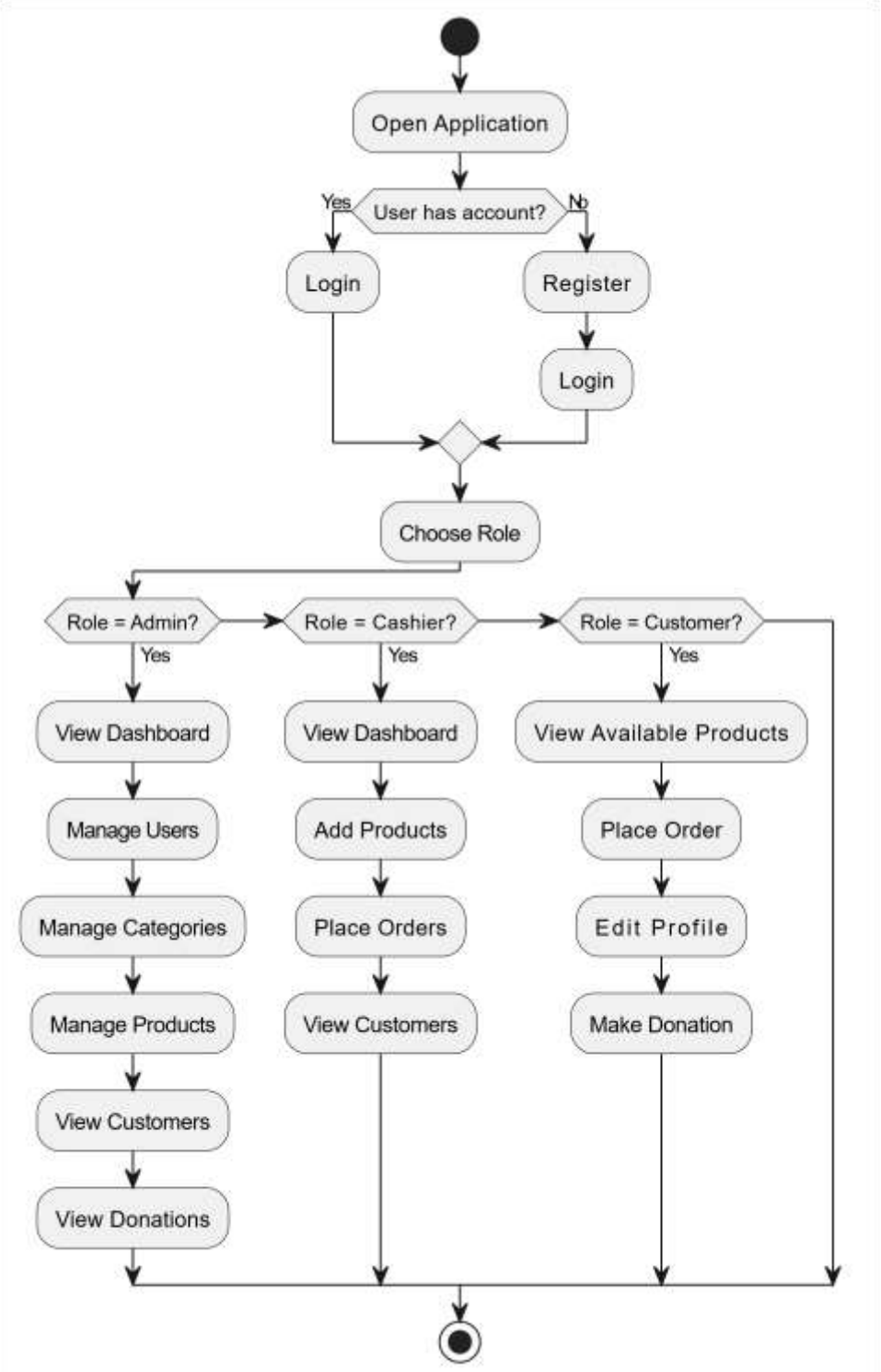


Fig.13 : Customer Donation Form.

CLASS DIAGRAM



USE CASE DIAGRAM



ACTIVITY DIAGRAM