DEPARTMENT OF COMPUTER ENGINEERING

CS 353 - Database Systems

Online Flower Shopping System

Final Report

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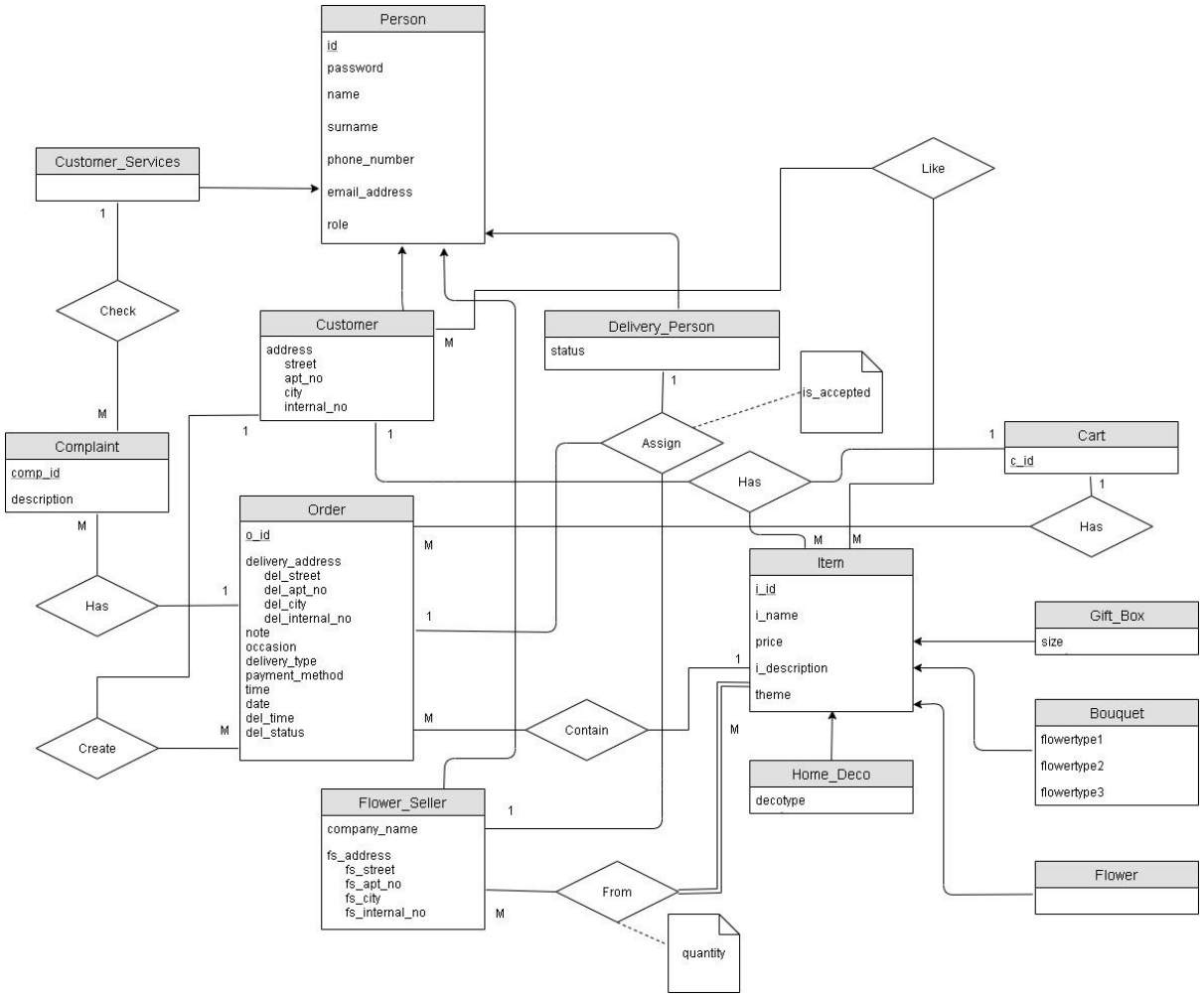
1. DESCRIPTION

The goal of the Online Flower Shopping System is to create an online flower shopping platform similar to the ÇiçekSepeti. The system that we created brings customers, flower-sellers, and couriers together in harmony. First of all, every customer, flower-seller, and courier must have an account in our database to make the whole progress in an easy way. In our system, flower-sellers can put their flowers up for sale to sell them easily within our system. Meanwhile, customers can see all the flowers which are for sale. If customers want to see specific types of flowers, they can easily filter flowers by type or color. If customers can see the details of selected flowers by clicking them, then they can easily add selected flowers with selected amounts into their shopping cart. After adding one or more flowers into their cards, customers can continue shopping to view other flowers or go to the checkout screen. In the checkout screen, customers enter their necessary information, also they have an option to add a note with the flowers, then buy their order. Payment can be done in different ways such as cash at delivery or beforehand via online payment through the system. Afterward, flower-sellers can view waiting for orders and they can either accept or reject the order. If the flower-seller accepts the order, they can assign each order to a specific courier. Couriers can view orders which are assigned to them and accept or reject orders as flower-sellers do. If couriers reject an order, they can still view the order until the order is assigned to another courier by the flower-seller. If couriers accept an order, they are given tasks to deliver the orders to delivery locations that users give in the checkout screen. After couriers deliver the order to the delivery location, they accept the successful delivery and the payment goes to the flower-seller. Our system also has extra functionality which is about to give new customers a welcome discount. If new customers enter their emails into a panel on the bottom of the screen, they get emails which include discount code.

2. FINAL E/R DIAGRAM

Changes on the E/R diagram according to the feedback:

- Removed History entity, Has and Added relations
- Changed relationship types for Assign relation
- Removed Flower_Seller from Create relation; it is now Customer-Create-Order with relation type one-to-many
- Removed quantity attribute from Item entity and added it to From relation
- Changed relationship type for Order-Contain-Item; it is now many-to-many
- Changed relationship type for Complaint-Has-Order; it is now many-to-one
- Removed type attribute from Item entity
- Removed flowertype attribute from Flower entity
- Added a new entity named Cart
- Added a new relation named Has
- Added a new relationship Customer-Has-Item-Cart with type one-many-one
- Added a new relation named Has
- Added a new relationship Cart-Has-Order with type one-to-many



3. TABLES

Some of these tables have extra columns in it. Hibernate automatically assigned columns.

3.1 List of Tables

Nesnelerin listesi

Şema	Ad²	Veri tipi	Sahibi
public	cart	tablo	postgres
public	cart_orders	tablo	postgres
public	fbuser	tablo	postgres
public	fbuser_id_gen	tablo	postgres
public	flower	tablo	postgres
public	flower_seller	tablo	postgres
public	hibernate_sequence	sequence	postgres
public	orders	tablo	postgres
public	role	tablo	postgres
public	user_role	tablo	postgres

3.2 Cart Table

```
florabasket-# \d cart
                          Tablo "public.cart"
   Kolon   | Veri tipi | S²ralama (collation) | Bo■ (null) olabilir | Varsay²lan
-----------+-----------+----------------------+---------------------+------------
 id        | bigint    |                      | not null            |
 total     | integer   |                      |                     |
 client_id | integer   |                      |                     |
¦ndeksler:
    "cart_pkey" PRIMARY KEY, btree (id)
¦kincil anahtar s²n²rlamalar²:
    "fk6ha88pfaxg0ew1jirjsbmdtdw" FOREIGN KEY (client_id) REFERENCES fbuser(id)
Referans veren:
    TABLE "cart_orders" CONSTRAINT "fkgvd2ag78sq7u5641clwjt73c5" FOREIGN KEY (cart_id) REFERENCES cart(id)
    TABLE "orders" CONSTRAINT "fktpihbdn6ws0hu56camb0bg2to" FOREIGN KEY (cart_id) REFERENCES cart(id)
```

3.3 User table

```
florabasket-# \d fbuser
                              Tablo "public.fbuser"
   Kolon   |       Veri tipi        | S²ralama (collation) | Bo■ (null) olabilir | Varsay²lan
-----------+-------------------------+----------------------+---------------------+------------
 id        | integer                 |                      | not null            |
 address   | character varying(255)  |                      |                     |
 city      | character varying(255)  |                      |                     |
 email     | character varying(255)  |                      |                     |
 enabled   | integer                 |                      |                     |
 firstname | character varying(255)  |                      |                     |
 password  | character varying(255)  |                      |                     |
 phone     | character varying(255)  |                      |                     |
 seller    | boolean                 |                      |                     |
 surname   | character varying(255)  |                      |                     |
 town      | character varying(255)  |                      |                     |
 website   | character varying(255)  |                      |                     |
¦ndeksler:
    "fbuser_pkey" PRIMARY KEY, btree (id)
Referans veren:
    TABLE "cart" CONSTRAINT "fk6ha88pfaxg0ew1jirjsbmdtdw" FOREIGN KEY (client_id) REFERENCES fbuser(id)
    TABLE "orders" CONSTRAINT "fk88aaaftqlx17g6me9jwrioykm" FOREIGN KEY (client_id) REFERENCES fbuser(id)
    TABLE "orders" CONSTRAINT "fk8j1w62gg61giq68b3nwl4e8p2" FOREIGN KEY (seller_id) REFERENCES fbuser(id)
    TABLE "user_role" CONSTRAINT "fk91frhi6ipn1qbk0lm1g8k7rgf" FOREIGN KEY (fbuser_id) REFERENCES fbuser(id)
    TABLE "orders" CONSTRAINT "fkknq8r168yvg9crr54o2lqnxjv" FOREIGN KEY (courier_id) REFERENCES fbuser(id)
    TABLE "flower_seller" CONSTRAINT "fkmr6rglq09ho2k4ykv2ml42mn" FOREIGN KEY (seller_id) REFERENCES fbuser(id)
```

```
florabasket-# \d role
                               Tablo "public.role"
 Kolon |       Veri tipi        | S²ralama (collation) | Bo■ (null) olabilir | Varsay²lan
-------+-------------------------+----------------------+---------------------+------------
 id    | bigint                  |                      | not null            |
 role  | character varying(255)  |                      |                     |
¦ndeksler:
    "role_pkey" PRIMARY KEY, btree (id)
Referans veren:
    TABLE "user_role" CONSTRAINT "fka68196081fvovjhkek5m97n3y" FOREIGN KEY (role_id) REFERENCES role(id)
```

```
florabasket-# \d user_role
                          Tablo "public.user_role"
   Kolon   | Veri tipi | S²ralama (collation) | Bo■ (null) olabilir | Varsay²lan
-----------+-----------+----------------------+---------------------+------------
 fbuser_id | integer   |                      | not null            |
 role_id   | bigint    |                      | not null            |
¦ndeksler:
    "user_role_pkey" PRIMARY KEY, btree (fbuser_id, role_id)
¦kincil anahtar s²n²rlamalar²:
    "fk91frhi6ipn1qbk0lm1g8k7rgf" FOREIGN KEY (fbuser_id) REFERENCES fbuser(id)
    "fka68196081fvovjhkek5m97n3y" FOREIGN KEY (role_id) REFERENCES role(id)
```

```
florabasket-# \d fbuser_id_gen
                                Tablo "public.fbuser_id_gen"
     Kolon     |       Veri tipi        | S²ralama (collation) | Bo■ (null) olabilir | Varsay²lan
---------------+------------------------+----------------------+---------------------+------------
 sequence_name | character varying(255) |                      | not null            |
 next_val      | bigint                 |                      |                     |
¦ndeksler:
    "fbuser_id_gen_pkey" PRIMARY KEY, btree (sequence_name)
```

3.4 Flower Table

```
florabasket-# \d flower
                                Tablo "public.flower"
      Kolon       |         Veri tipi          | S²ralama (collation) | Bo■ (null) olabilir | Varsay²lan
------------------+----------------------------+----------------------+---------------------+------------
 id               | bigint                     |                      | not null            |
 category         | character varying(255)     |                      |                     |
 color            | character varying(255)     |                      |                     |
 explanation      | character varying(100000)  |                      |                     |
 hover_image_link | character varying(255)     |                      |                     |
 imagelink        | character varying(255)     |                      |                     |
 imagelink2       | character varying(255)     |                      |                     |
 imagelink3       | character varying(255)     |                      |                     |
 imagelink4       | character varying(255)     |                      |                     |
 name             | character varying(255)     |                      |                     |
 price            | character varying(255)     |                      |                     |
¦ndeksler:
    "flower_pkey" PRIMARY KEY, btree (id)
Referans veren:
    TABLE "flower_seller" CONSTRAINT "fkl4f1mmp2dqu9odvb1nedy2ljw" FOREIGN KEY (flower_id) REFERENCES flower(id)
    TABLE "orders" CONSTRAINT "fkm9jenpncs2xmrw9vb7qf3a9ya" FOREIGN KEY (flower_id) REFERENCES flower(id)
```

3.5 Flower Seller Table

```
florabasket-# \d flower_seller
                        Tablo "public.flower_seller"
   Kolon   | Veri tipi | S²ralama (collation) | Bo■ (null) olabilir | Varsay²lan
-----------+-----------+----------------------+---------------------+------------
 flower_id | bigint    |                      | not null            |
 seller_id | integer   |                      | not null            |
¦ndeksler:
    "flower_seller_pkey" PRIMARY KEY, btree (flower_id, seller_id)
¦kincil anahtar s²n²rlamalar²:
    "fkl4f1mmp2dqu9odvb1nedy2ljw" FOREIGN KEY (flower_id) REFERENCES flower(id)
    "fkmr6rglq09ho2k4ykv2ml42mn" FOREIGN KEY (seller_id) REFERENCES fbuser(id)
```

3.6 Order Table

```
florabasket-# \d orders
                                Tablo "public.orders"
      Kolon       |       Veri tipi        | S²ralama (collation) | Bo■ (null) olabilir | Varsay²lan
------------------+------------------------+----------------------+---------------------+------------
 id               | bigint                 |                      | not null            |
 address          | character varying(255) |                      |                     |
 delivery_status  | character varying(255) |                      |                     |
 delivery_type    | character varying(255) |                      |                     |
 note             | character varying(255) |                      |                     |
 occasion         | character varying(255) |                      |                     |
 payment_completed | boolean                |                      |                     |
 payment_method   | character varying(255) |                      |                     |
 quantity         | integer                |                      |                     |
 status           | character varying(255) |                      |                     |
 cart_id          | bigint                 |                      |                     |
 client_id        | integer                |                      |                     |
 courier_id       | integer                |                      |                     |
 flower_id        | bigint                 |                      |                     |
 seller_id        | integer                |                      |                     |
¦ndeksler:
    "orders_pkey" PRIMARY KEY, btree (id)
¦kincil anahtar s²n²rlamalar²:
    "fk88aaaftqlx17g6me9jwrioykm" FOREIGN KEY (client_id) REFERENCES fbuser(id)
    "fk8j1w62gg61giq68b3nwl4e8p2" FOREIGN KEY (seller_id) REFERENCES fbuser(id)
    "fkknq8r168yvg9crr54o2lqnxjv" FOREIGN KEY (courier_id) REFERENCES fbuser(id)
    "fkm9jenpncs2xmrw9vb7qf3a9ya" FOREIGN KEY (flower_id) REFERENCES flower(id)
    "fktpihbdn6ws0hu56camb0bg2to" FOREIGN KEY (cart_id) REFERENCES cart(id)
Referans veren:
    TABLE "cart_orders" CONSTRAINT "fk5t1looqsw3i3sds82wx5c2bap" FOREIGN KEY (orders_id) REFERENCES orders(id)
```

4. IMPLEMENTATION DETAILS

4.1 Technology Details

After the design report, all the technology used for the project has changed. Here is the list of technologies used in this project:

- Frontend: Html CSS js jquery Bootstrap
- Database relations and queries: Hibernate JPA
- Database: Postgresql
- View template: Thymeleaf
- Deployment: Amazon web services, Postgresql instance
- Spring-security
- Spring-mail
- Spring-web

4.2 Obstacles Faced on Implementation Phase

- The authentication of the project was difficult. Since there are 3 types of users in this program which are client, flower seller and courier.

- All of the users have different page structure and anyone of user type shouldn't interfere with another user. There is a big obstacle in this feature.
- Also the client can't give an order if he/she wasn't registered to the system. This is a big struggle in developing the project.
- Creating relationships between entities is also a struggle while developing the project.
- Using Bootstrap for Frontend caused trouble while developing. To list orders, items etc. list groups used. The lists have appeared on different locations of application. The relationship between backend and frontend was a struggle.
- The deployment to Amazon Web Services was really hard. Here is the link for it: http://who-env.eba-cpey3tte.eu-central-1.elasticbeanstalk.com/home
- Adding items cart before turning them into order.
- Using MVC design pattern was a big struggle for the project.

5. ADVANCED DATABASE COMPONENTS

5.1 Select Components

On the below, some of the select components have shown. There are more than 6 components but putting them into report will exceed 2 pages for advanced database components. So we give a couple examples of it.

- SELECT orders o FROM orders WHERE o.seller = 'seller' AND o.assigned = 'true'
- SELECT orders order FROM orders WHERE order.courier = 'courier'
- SELECT fbflower u FROM fbflower WHERE u.flower = 'flower' AND u.assigned = 'false'
- SELECT fbrole u FROM fbrole WHERE u.role = 'role' AND u.role = 'true'
- SELECT user0_.id as id1_2_, user0_.address as address2_2_, user0_.city as city3_2_, user0_.email as email4_2_, user0_.enabled as enabled5_2_, user0_.firstname as firstnam6_2_, user0_.password as password7_2_, user0_.phone as phone8_2_, user0_.seller as seller9_2_, user0_.surname as surname10_2_, user0_.town as town11_2_, user0_.website as website12_2_ from fbuser user0_ left outer join flower_seller flowers1_ on user0_.id=flowers1_.seller_id left outer join flower flower2_ on flowers1_.flower_id=flower2_.id where flower2_.id=?
- SELECT flower0_.id as id1_3_0_, flower0_.explanation as explanat2_3_0_, flower0_.hover_image_link as hover_im3_3_0_, flower0_.imagelink as imagelin4_3_0_, flower0_.imagelink2 as imagelin5_3_0_, flower0_.imagelink3 as imagelin6_3_0_, flower0_.imagelink4 as imagelin7_3_0_, flower0_.name as

name8_3_0_, flower0_.price as price9_3_0_ from flower flower0_ where flower0_.id=?

5.2 Create Components

On the below, some of the created components have shown. There are more than 6 components but putting them into report will exceed 2 pages for advanced database components. So we give a couple examples of it.

- create table cart (id int8 not null, total int4, client_id int4, primary key (id))
- create table cart_orders (cart_id int8 not null, orders_id int8 not null, primary key (cart_id, orders_id))
- create table fbuser (id int4 not null, address varchar(255), city varchar(255), email varchar(255), enabled int4, firstname varchar(255), password varchar(255), phone varchar(255), seller boolean, surname varchar(255), town varchar(255), website varchar(255), primary key (id))
- create table flower (id int8 not null, category varchar(255), color varchar(255), explanation varchar(100000), hover_image_link varchar(255), imagelink varchar(255), imagelink2 varchar(255), imagelink3 varchar(255), imagelink4 varchar(255), name varchar(255), price varchar(255), primary key (id))
- create table flower_seller (flower_id int8 not null, seller_id int4 not null, primary key (flower_id, seller_id))
- create table orders (id int8 not null, address varchar(255), delivery_status varchar(255), delivery_type varchar(255), note varchar(255), occasion varchar(255), payment_completed boolean, payment_method varchar(255), quantity int4, status varchar(255), cart_id int8, client_id int4, courier_id int4, flower_id int8, seller_id int4, primary key (id))

5.3 Insert Into Components

On the below, some of the insert into components have shown. There are more than 6 inserts into components but putting them into report will exceed 2 pages for advanced database components. So we give a couple examples of it.

- INSERT INTO role (id, role) VALUES (1, 'CLIENT');
- INSERT INTO flower (category, color, id, name, price, imagelink, hover_image_link, imagelink2, imagelink3, imagelink4, explanation) VALUES ('Bouquet' ,'Purple', 1, 'Orkid', '$180', 'img/product-img/gumus-saksi-mini-orkide-2.jpg', 'img/product-img/gumus-saksi-mini-orkide-1.jpg', 'img/product-img/kalpli-groot-serisi-mini-orkide-2.jpg',

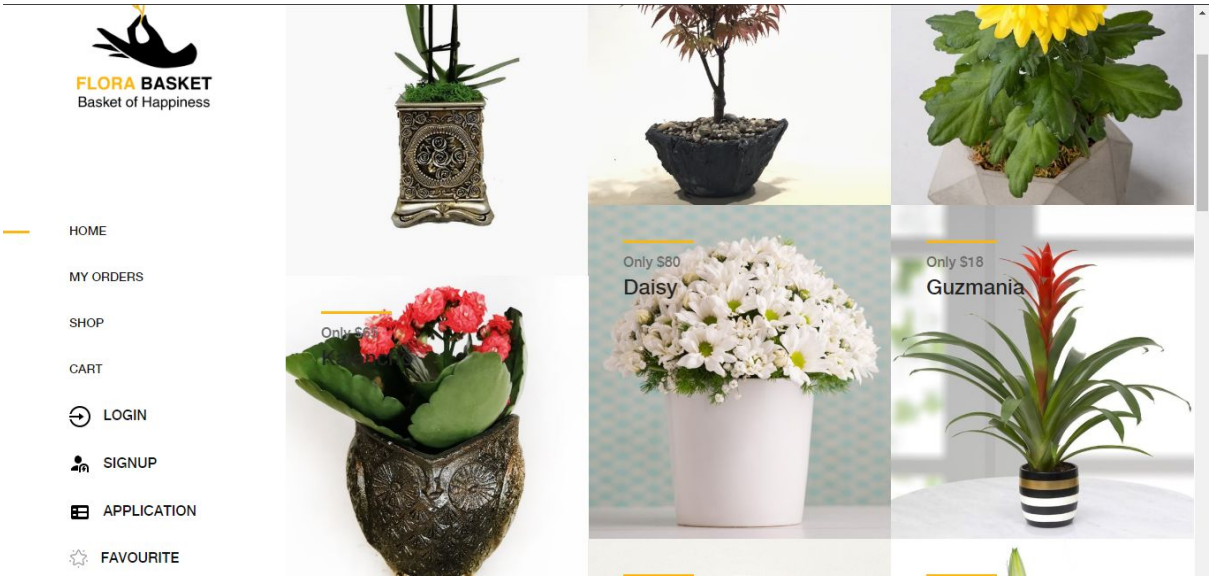
'img/product-img/kalpli-groot-serisi-mini-orkide-1.jpg', 'img/product-img/kalpli-groot-serisi-mini-orkide-1.jpg', 'In the most restrictive sense, "bonsai" refers to miniaturized, container-grown trees adhering to Japanese tradition and principles. ...');

- INSERT INTO fbuser (id, address, city, email, enabled, firstname, password, phone, seller, surname, town, website) values (1, 'Bilkent Universitesi', 'Ankara', 'bilkentcicek@gmail.com', 1, 'Bilkent Cicek', '$2a$10$O5gyyMOsXj1CgPFtRfGmLevwUsb7VjTt.EYTYaBYjd2lZz9ZIPCi6', '05533455643', true, '', 'Ankara', 'bilkentcicek.com');
- INSERT INTO cart(id, client_id) VALUES (15, 5);
- INSERT INTO user_role (fbuser_id, role_id) VALUES(1, 2);
- INSERT INTO flower_seller (seller_id, flower_id) VALUES (1,1);

6. User Manual

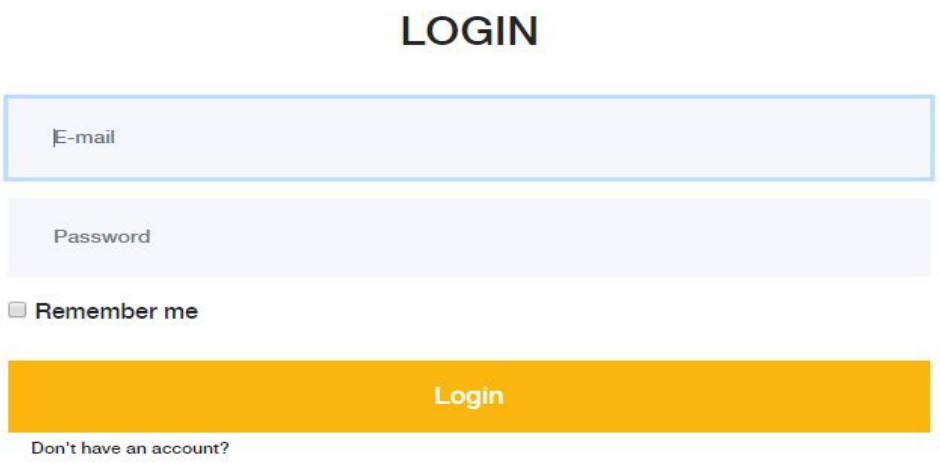
6.1. General Usage

6.1.1. Home Page



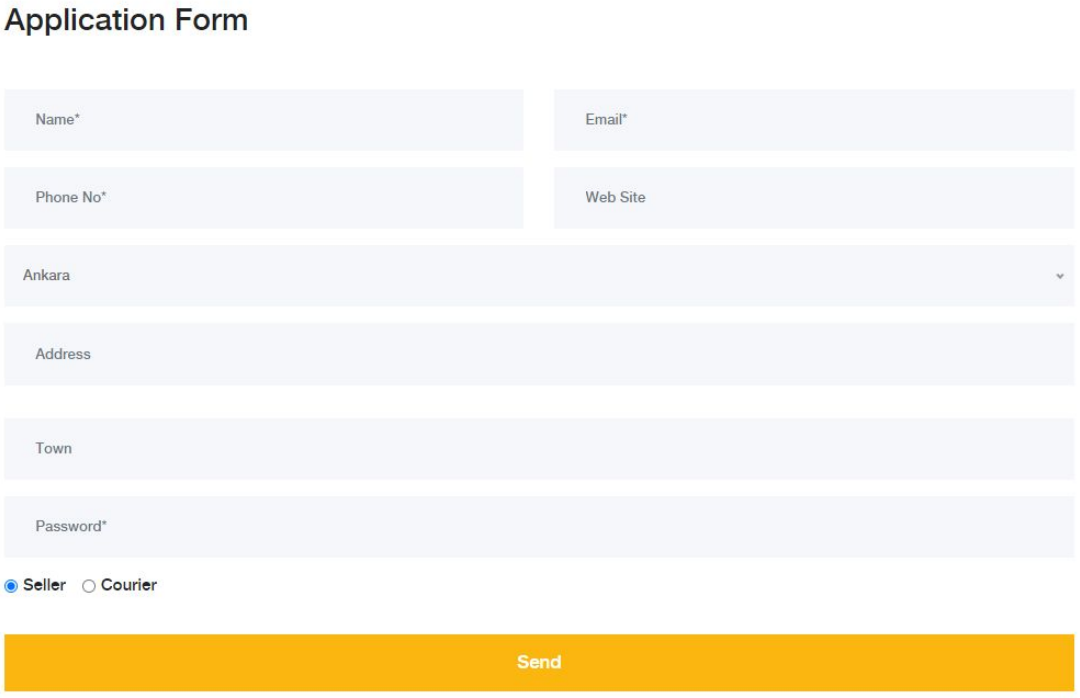
Users are able to see the products which are currently in the marketplace on the right hand side of the HomePage and the left hand side is for navigation purposes including My ORDERS, SHOP, CHART, LOGIN, SIGNUP, APPLICATION AND FAVORITE.

6.1.2 LOGIN



Login has general use for all three kinds of clients(Customer, Seller, Courier). Every client has to login in order to participate in active use of the FloraBasket. Every client must login with the unique Email and password they have used at the SIGNUP page. If a user already has an Account that is in the system, that user may go to the LOGIN page by clicking on “Don't have an account?” that is at the bottom left corner.

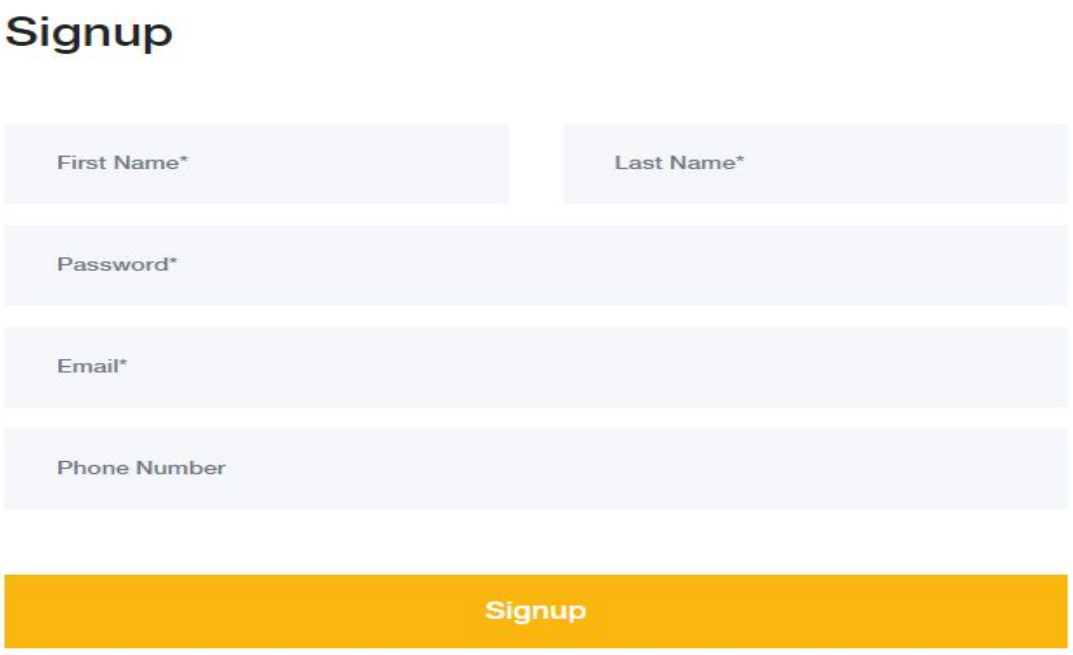
6.1.3. Application Form Page For Flower-seller and Courier



Unlike Customers, Sellers and Couriers have to use Application Form to register and take action in the system. Name, Email, Phone No, Location, Address, Password and one of two from Seller or Courier must be given.

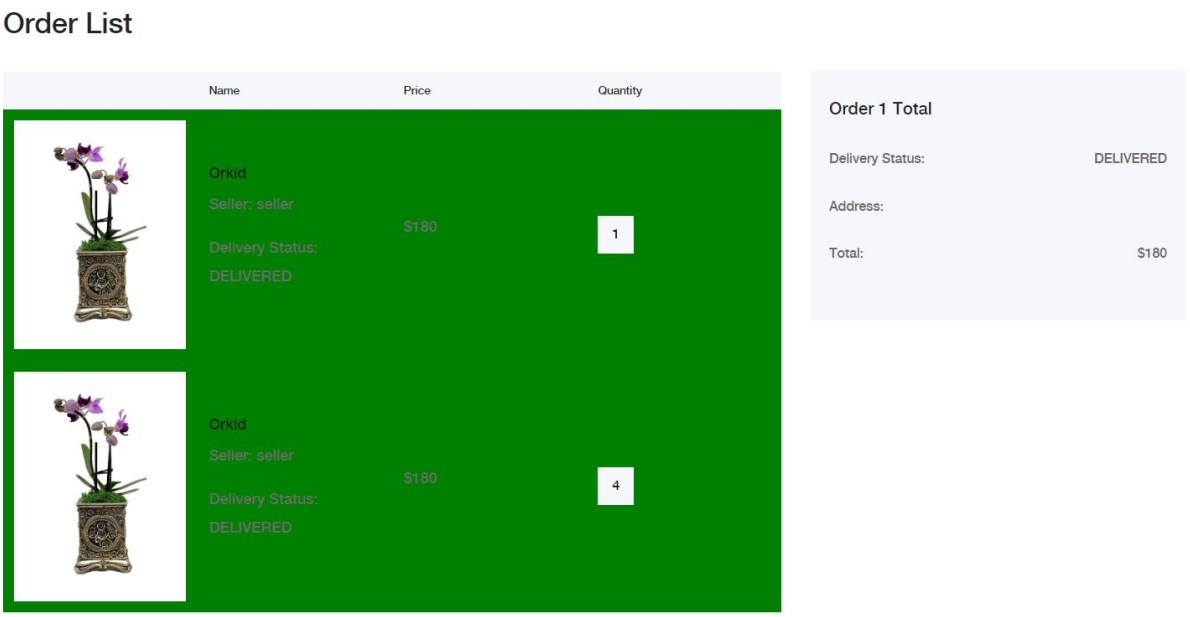
6.2 For Customer Use

6.2.1 Signup Page



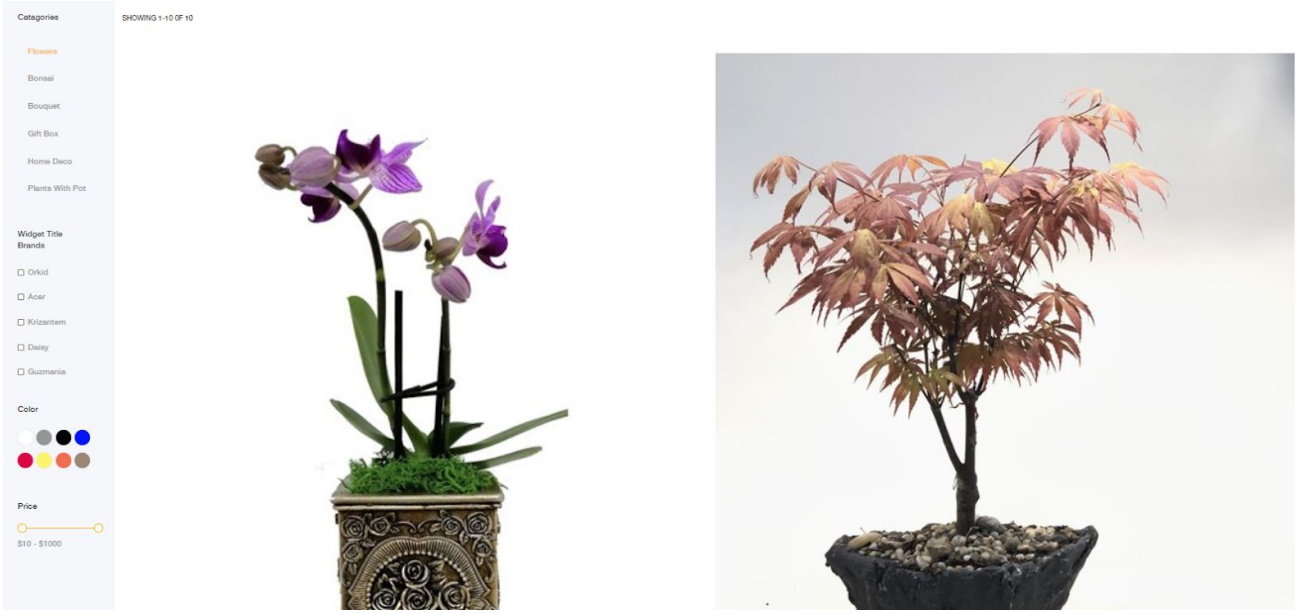
Every customer must have an account in order to use the services of FloraBasket. For this purpose clients create unique accounts tagged with First Name, Last Name, Password and Email. Every Email can be assigned to only 1 client so there is one to one relationship with Email and Account. If a user has Account that is in the system, that user may go to the SIGNUP page by clicking on “Don't have an account?” that is at the bottom left corner and that will lead the client to the SIGNUP page.

6.2.2. Order List Page



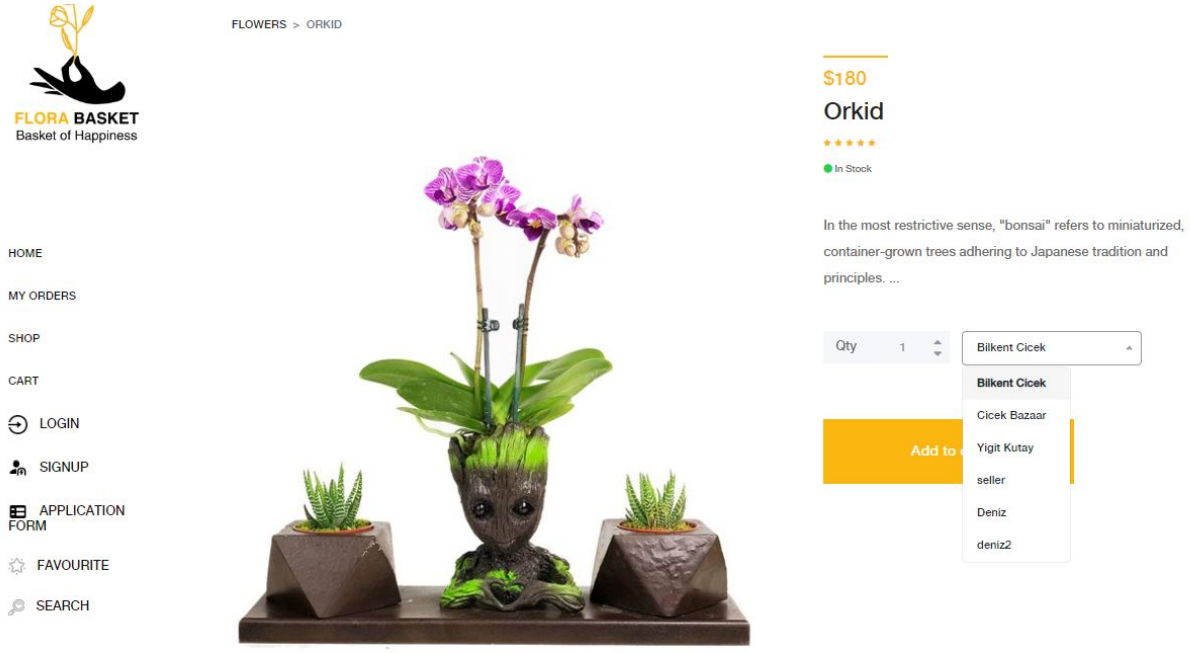
In this page, customers can view their orders's information and delivery status of them. If the customer creates a new order, a newly created order is automatically listed on this page. If the background of the order is green, it is meant that the order is successfully delivered. If not, the delivery can be pending, rejected or assigned to the courier

6.2.3. Adjustable Categories In Shop Screen



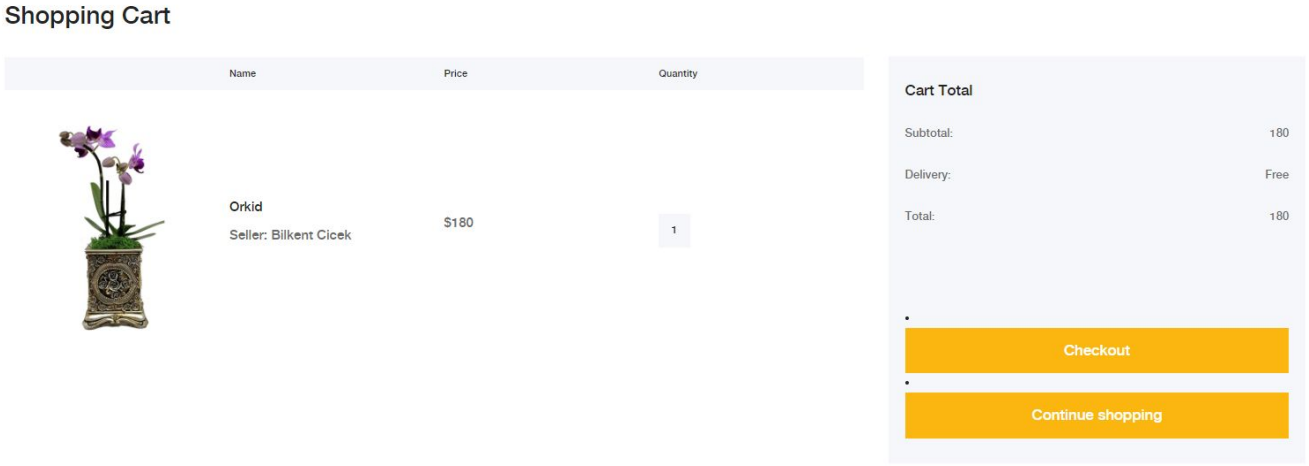
This is the shop screen that customers can view all of the flowers which are for sale. Customers can also filter the flowers by flower types or colors. This filtering option helps customers to find the specific types of flowers easily. On the other hand, newly added flowers can also have these filters to be found easily too.

6.2.4. Add Flower To Basket Page



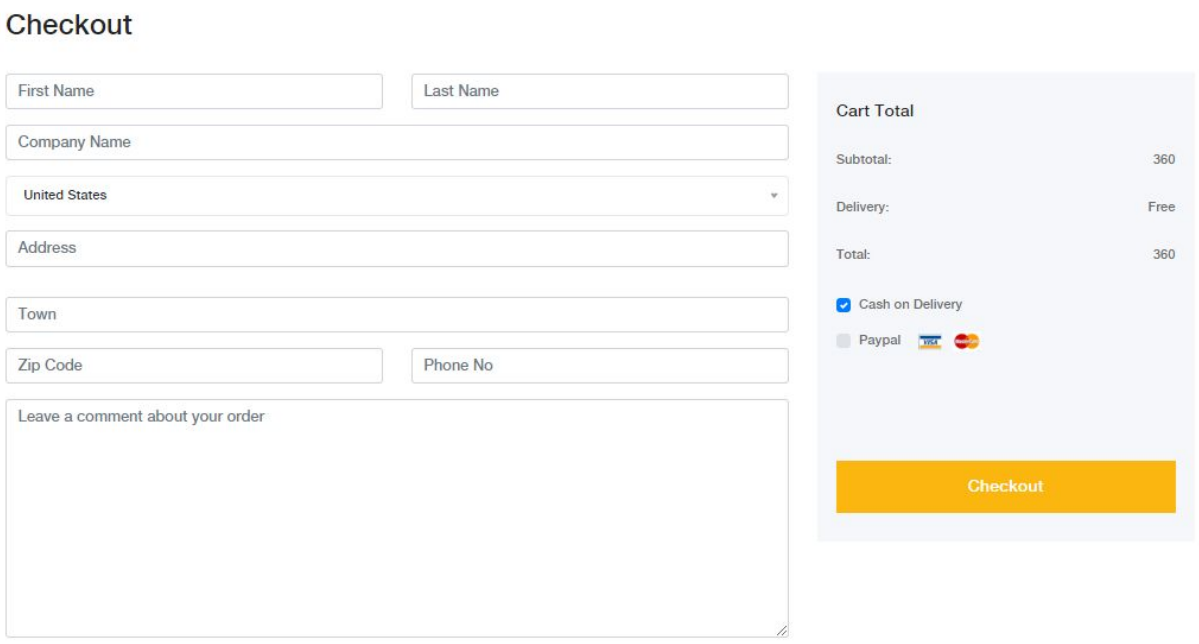
Customers can add only one type of flower to the chart at a time but the quantity of that flower is not restricted. So customers can add as many flowers as they want from the same flower. Also customers can choose which Seller they want to buy from as long as that Seller has that flower in their possession, it will appear in the list of Sellers. But still flowers are not on the road to delivery because customers must check out first.

6.2.5. Shopping Cart Page



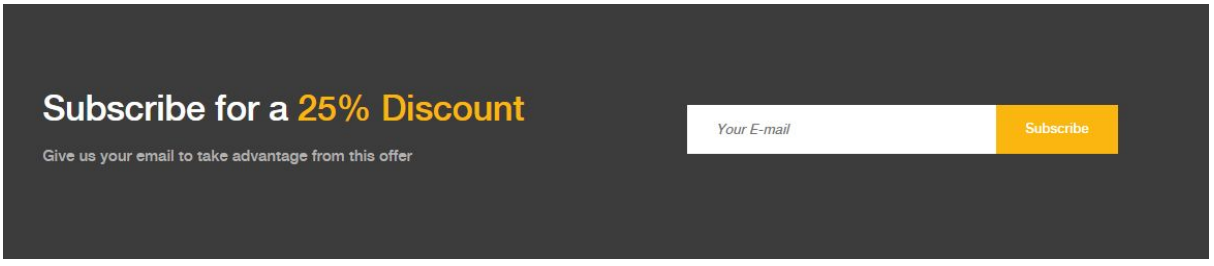
Customers can view their shopping cart with flowers in it. They also view information about items in cart. Moreover, subtotal price, delivery price and total price can be viewed. Subtotal price is the total price of flowers in cart. Total price is the sum of delivery price and subtotal price. On the other hand, customers can go to the shop page to view other flowers by clicking the 'continue shopping' button, also they can go to the checkout page by clicking the 'checkout' button.

6.2.6. Checkout Page



Checkout Page is the final page for customers to complete the shopping process on the customer side. First Name, Last Name, Company Name, Country, Address, Zip Code must be entered. This page is for invoice details to hold in the database, thus customers may enter different First Name, Last Name, Company Name than the ones the customer used to register.

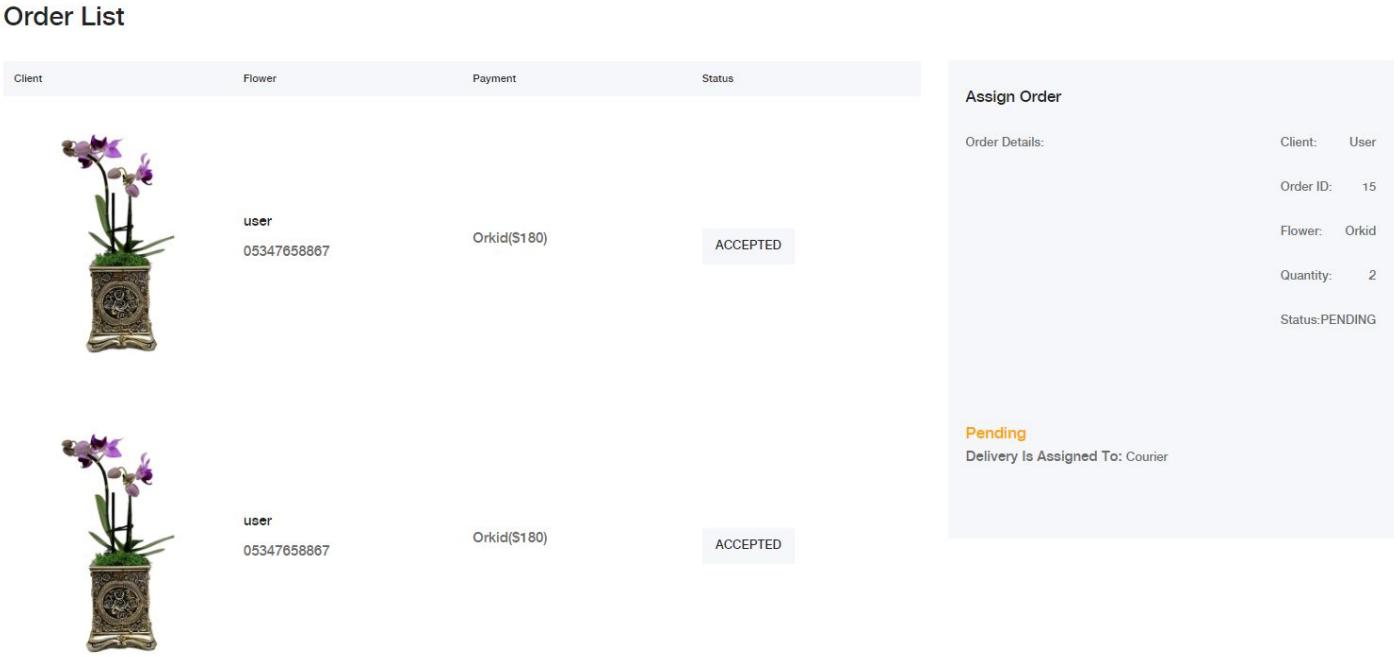
6.2.7. Subscription Panel



When you give an email address to the application, you get a 25%discount for further shopping. The program informs you by sending you an email about the discount.

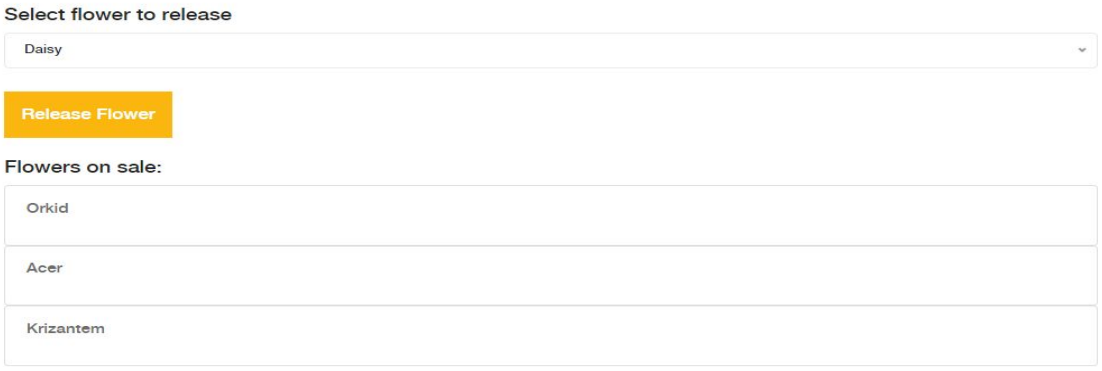
6.3. Flower Seller

6.3.1. Order List of Flower Seller



Flower sellers can select any of the orders by clicking on it. The important information, such as quantity, total price, transportation details(delivered or not, courier name) of the selected order appeared in the table on the right. Sellers can select a courier from the list of couriers.

6.3.2. Getting Flower From Stock

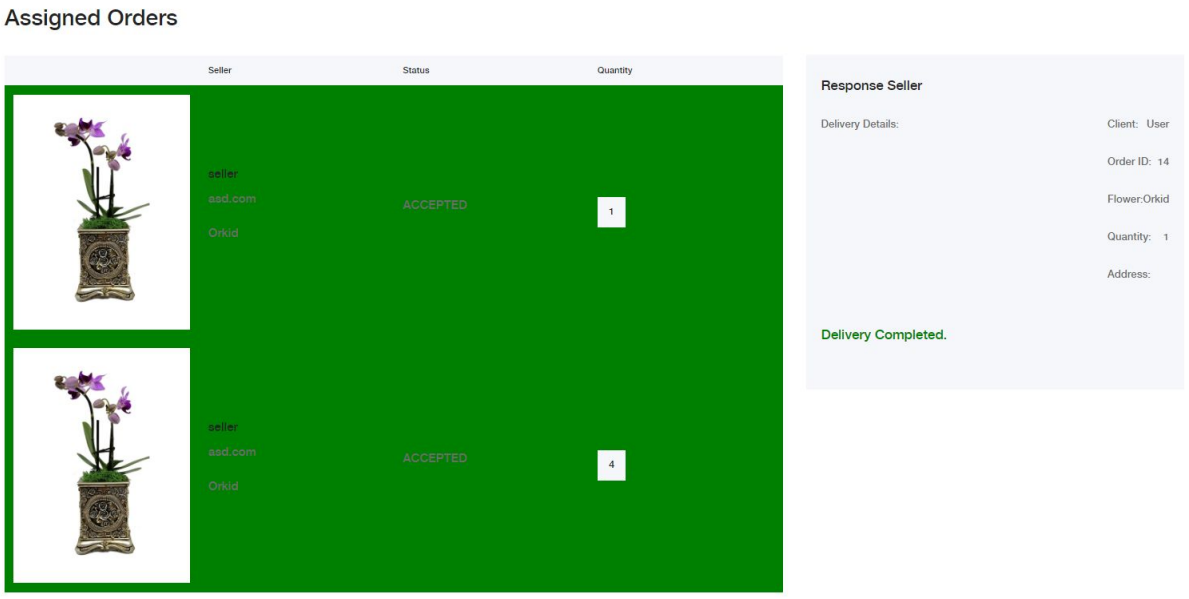


On this page, flower-sellers can release their flowers. They can select the flower by the name and release it by clicking the ‘release flower’ button. After releasing a flower, the name of the

flower is listed on the ‘flowers on sale’ panel with other listed flowers. Flower-sellers can not release the same flower twice, to make sure of that, the released flower name is not in the release menu any longer.

6.4. Courier

6.4.1. Assigned Orders Page



Couriers can view assigned orders to them. Couriers can accept or reject assigned orders. If couriers reject an order, they can view rejected orders until the order is assigned to another courier by the flower-seller. If couriers accept the order, the delivery status of the order changes automatically to show that order is accepted by the courier to deliver it to the location. After the delivery is successfully completed, the courier clicks the successful delivery button to make delivery status of the order ‘delivery completed’. If the order is successfully delivered, the background of it becomes green to clearly indicate that delivery is successfully completed.

7. WEBSITE

The website of application is on the below:
http://who-env.eba-cpey3tte.eu-central-1.elasticbeanstalk.com/home
The website of our group and report is on the below:
https://dogacankaynak.github.io/onlineFlowerShoppingSystem/