Bilkent University

Department of Computer Engineering

CS353 Database Systems

Social Network for Check-In - CheckMe

Project URL: http://bit.ly/CS353DB

Final Report

Ahmet Çandıroğlu, Albjon Gjuzi, Aurel Hoxha, Eniselda Tusku

Supervisor: Fuat Basık

May 14, 2018

This report is submitted to the Department of Computer Engineering of Bilkent University in partial fulfillment of the requirements of the Database Systems, course CS353.

Table of Contents

1. Project Description

For the purpose of this course we have designed and developed a database for a “Social Network for Check-ins”. As the name suggests, the fundamental idea of our system is to discover many interesting places easily and to allow the user to socialize with other people. The locations are placed into categories and subcategories in order to facilitate the searching process. After the user has chosen a certain venue he is able to “check in”, rate, write a review, leave a suggestion and mark that review as a favorite or as “plan to visit”. Together with this, each user has his own profile in which he can store different information regarding to his preferred locations and being in a social network he will be able to communicate and share them with his friends by following them, being followed back and exchanging messages. The system will be accessed by 2 different types of users: *simple users* and *managers*. Simple users will be able to create their accounts, to search for different venues and places, check-in, rate the locations, and update their profile. Managers will be able to update information regarding the venue they are managing such as hotel, restaurant etc., with photos and different information. However, they will not be able to remove the comments made by users, in order to guarantee transparency. Users are also able to complete their profile and add preferences to it which will enable for him to see in his newsfeed information related to his preferences.

2. Individual Contributions

Regarding the development of the project all the group members have worked together exchanging ideas and commonly contributing to make the system fully functional and including all the necessary features. However, individual members are focused mainly as follows:

Ahmet Çandıroğlu: Worked on building the user profile involving all of its features also building the venue with all its requirements. Also updated the uploading process of the photo, creating different folders for different users.

Aurel Hoxha: Worked on developing the registration, login, uploading user photos and also took care of the managing venue page and changing password of the user using the current one.

Eniselda Tusku: Worked on developing the communication between different users building the messages and also building the following and followers page and the favorite venues page.

Albjon Gjuzi: Worked on making possible for the user to edit his profile. For the venue was responsible for venue registering process and also editing the venue profile.

The explore page was built in the end by all the group members.

However it is important to emphasize that the contributions of each member are not limited to the above list as we interactively helped each other on their parts and worked together to overcome the challenges of implementation.

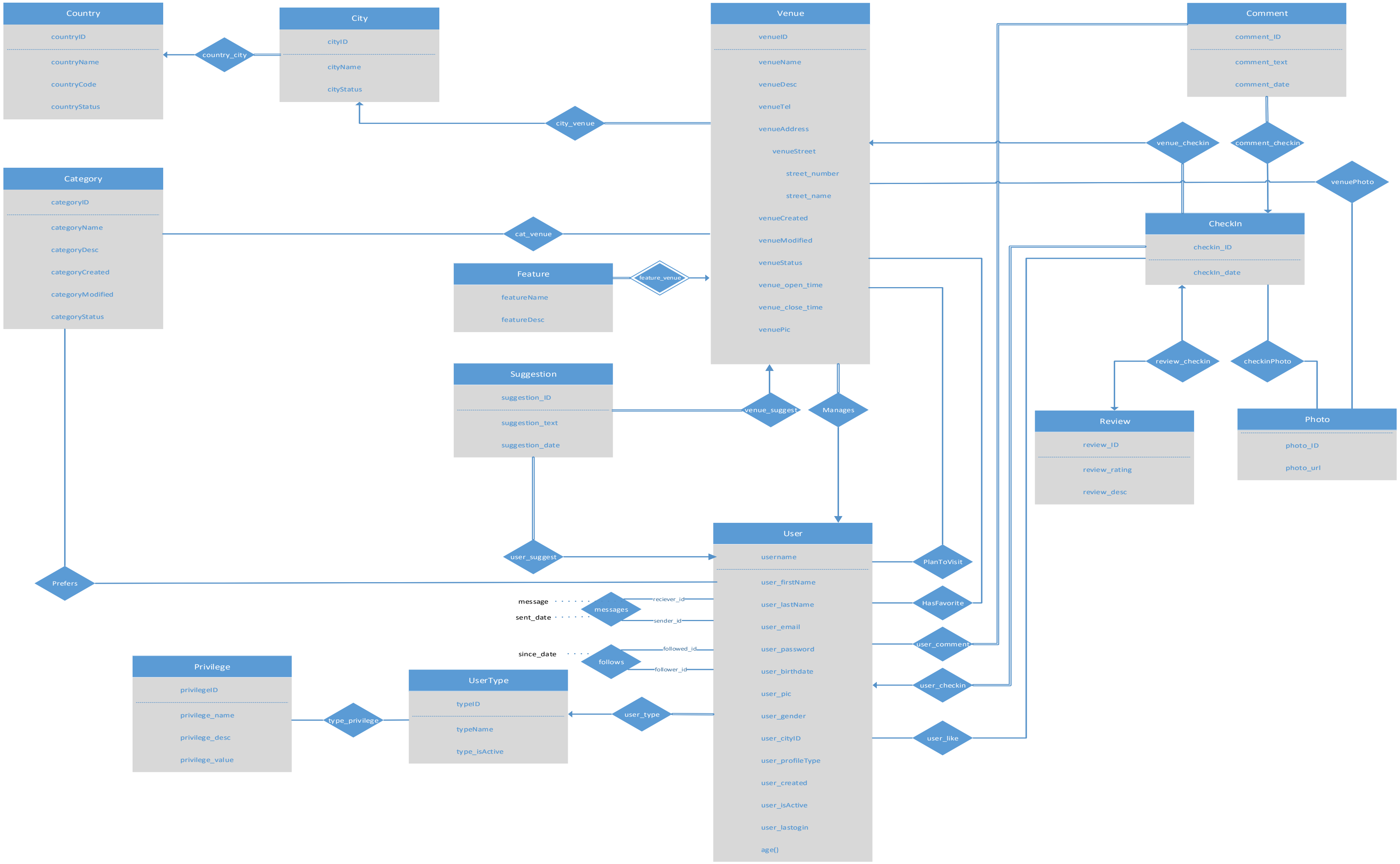
3. Final E/R Model

According to assistant feedback and our own insight we revised the E/R Model as follows:

- The userID was changed from int to varchar to make it more efficient.
- We removed the reviewID from checkin table and added checkinID into review.
- Into messages table we added the date of the messaged.
- Added venueTel attribute into venue table to have it as information.
- The photo is not saved anymore as blob but as varchar.
- The table was changed from friends into follows.
- Into follows table the sinceDate was added.
- Messages table was fixed by adding the sent_date.
- A constrain was added for the city in user_table to reference city table.
- Into usertype table the type_groupid was removed since we realized it was unnecessary.

The E/R diagram was completed adding the following modification:

- State table was removed from the database since it is used mostly only in US.
- Photo was removed as an weak entity and it became a new table.
- VenuePhoto table was added in order to keep some photos for the venue.
- CheckinPhoto table was added to keep the photos of a particular checkin.
- Photo entity was added as e weak entity to CheckIn. The reason for this is because it is in user preferences whether or not to merge a photo with the CheckIn.


Country
countryID
countryName
countryCode
countryStatus
country_city
City
cityID
cityName
cityStatus
city_venue
Venue
venueID
venueName
venueDesc
venueTel
venueAddress
venueStreet
street_number
street_name
venueCreated
venueModified
venueStatus
venue_open_time
venue_close_time
venuePic
Comment
comment_ID
comment_text
comment_date
venue_checkin
comment_checkin
venuePhoto
CheckIn
checkin_ID
checkIn_date
Category
categoryID
categoryName
categoryDesc
categoryCreated
categoryModified
categoryStatus
cat_venue
Feature
featureName
featureDesc
feature_venue
review_checkin
checkinPhoto
Suggestion
suggestion_ID
suggestion_text
suggestion_date
venue_suggest
Manages
Review
review_ID
review_rating
review_desc
Photo
photo_ID
photo_url
user_suggest
User
username
user_firstName
user_lastName
user_email
user_password
user_birthdate
user_pic
user_gender
user_cityID
user_profileType
user_created
user_isActive
user_lastogin
age()
PlanToVisit
HasFavorite
user_comment
user_checkin
user_like
Prefers
message
sent_date
messages
reciever_id
sender_id
since_date
follows
followed_id
follower_id
Privilege
privilegeID
privilege_name
privilege_desc
privilege_value
type_privilege
UserType
typeID
typeName
type_isActive
user_type

4. Final List Of Tables

4.1. Country

Relational Mode:

Country(countryID, countryName, countryCode, countryStatus)

Candidate Keys:

{(countryID, countryName, countryCode)}

Foreign Keys:

Normal Form:

BCNF

4.2. City

Relational Mode:

Country(cityID, cityName, cityStatus, countryID)

Candidate Keys:

{(cityID, cityName)}

Foreign Keys:

countryID REFERENCES country(countryID)

Normal Form:

BCNF

4.3. Category

Relational Mode:

Category(categoryID, categoryName, categoryDesc, categoryCreated, categoryModified, categoryStatus)

Candidate Keys:

{(cityID, categoryName)}

Foreign Keys:

Normal Form:

BCNF

4.4. Venue

Relational Mode:
Venue (venueID, venueName, venueDesc, venueTel, street_number, street_name, cityID, venueCreated, venueModified, venueStatus, venueOpenTime, venueCloseTime, venuePic, managerName)
Candidate Keys:
{(venueID, venueName)}
Foreign Keys:
cityID REFERENCES city(cityID)
managerName REFERENCES user_table(username)
Normal Form:
BCNF

4.5. Feature

Relational Mode:
Feature(VenueID, featureName, featureDesc)
Candidate Keys:
{(venueID, featureName)}
Foreign Keys:
venueID REFERENCES venue(venueID)
Normal Form:
BCNF

4.6. Cat_Venue

Relational Mode:
Cat_Vanue(categoryID, venueID)
Candidate Keys:
{(categoryID, venueID)}
Foreign Keys:
categoryID REFERENCES category(categoryID)
venueID REFERENCES venue(venueID)
Normal Form:
BCNF

4.7. Privilege

Relational Mode:

Privilege(privilegeID, privilege_name, privilege_desc, privilege_value)

Candidate Keys:

{(privilegeID, privilege_name)}

Foreign Keys:

Normal Form:

BCNF

4.8. UserType

Relational Mode:

UserType(typeID, typeName, type_isActive)

Candidate Keys:

{(privilegeID, typeName)}

Foreign Keys:

Normal Form:

BCNF

4.9. Type_Privilege

Relational Mode:

Type_Privilege (typeID, privilegeID)

Candidate Keys:

{(typeID, privilegeID)}

Foreign Keys:

typeID REFERENCES usertype(typeID)
privilegeID REFERENCES privilege(privilegeID)

Normal Form:

BCNF

4.10. User_Table

Relational Mode:

User_Table (username, user_firstName, user_lastName, user_email, user_password, user_birthdate, user_pic, user_gender, user_cityID, user_profileType, user_created, user_isActive, user_lastlogin)

Candidate Keys:

{(_username, user_email)}

Foreign Keys:

user_cityID REFERENCES city(cityID)
user_profileType REFERENCES userType(typeID)

Normal Form:

BCNF

4.11. Prefers

Relational Mode:

Prefers(username, categoryID)

Candidate Keys:

{(username, categoryID)}

Foreign Keys:

username REFERENCES user_table(username)
categoryID REFERENCES category(categoryID)

Normal Form:

BCNF

4.12. Message

Relational Mode:

Message (sender, receiver, message, sent_date)

Candidate Keys:

{(sender, receiver)}

Foreign Keys:

sender REFERENCES user_table(username)
receiver REFERENCES user_table (username)

Normal Form:

BCNF

4.13. Follows

Relational Mode:

Follows (follower, followed, since_date)

Candidate Keys:

{(follower, followed)}

Foreign Keys:

follower REFERENCES user_table(username)
followed REFERENCES user_table (username)

Normal Form:

BCNF

4.14. Suggestion

Relational Mode:

Suggestion(suggestionID, suggestion_text, suggestion_date, venueID, username)

Candidate Keys:

{(suggestionID)}

Foreign Keys:

venueID REFERENCES venue(venueID)
username REFERENCES user_table (username)

Normal Form:

BCNF

4.15. PlanToVisit

Relational Mode:

PlanToVisit(username, venueID)

Candidate Keys:

{(username, venueID)}

Foreign Keys:

username REFERENCES user_table (username)
venueID REFERENCES venue(venueID)

Normal Form:

BCNF

4.16. HasFavorite

Relational Mode:

HasFavorite(username, venueID)

Candidate Keys:

{(username, venueID)}

Foreign Keys:

username REFERENCES user_table (username)

venueID REFERENCES venue(venueID)

Normal Form:

BCNF

4.17. CheckIn

Relational Mode:

CheckIn (checkinID, checkin_date, username, venueID)

Candidate Keys:

{(checkinID)}

Foreign Keys:

username REFERENCES user_table (username)

venueID REFERENCES venue(venueID)

Normal Form:

BCNF

4.18. Photo

Relational Mode:

Photo (photoID, photoUrl)

Candidate Keys:

{(photoID)}

Foreign Keys:

Normal Form:

BCNF

4.19. CheckInPhoto

Relational Mode:

CheckInPhoto (<u>checkinID, photoID</u>)

Candidate Keys:

{(checkinID, photoID)}

Foreign Keys:

checkinID REFERENCES checkin (checkinID)

photoID REFERENCES photo (photoID)

Normal Form:

BCNF

4.20. VenuePhoto

Relational Mode:

VenuePhoto (<u>venueID, photoID</u>)

Candidate Keys:

{(venueID, photoID)}

Foreign Keys:

venueID REFERENCES venue (venueID)

photoID REFERENCES photo (photoID)

Normal Form:

BCNF

4.21. Review

Relational Mode:

Review (<u>reviewID</u>, checkinID, review_rating, review_desc)

Candidate Keys:

{(reviewID)}

Foreign Keys:

checkinID REFERENCES checkin (checkinID)

Normal Form:

BCNF

4.22. Comment

Relational Mode:

Comment (commentID, comment_text, comment_date, username, checkinID)

Candidate Keys:

{(commentID)}

Foreign Keys:

username REFERENCES user_table (username)
checkinID REFERENCES checkin (checkinID)

Normal Form:

BCNF

4.23. User_Like

Relational Mode:

User_Like(userID, checkinID)

Candidate Keys:

{(userID, checkinID)}

Foreign Keys:

username REFERENCES user_table (username)
checkinID REFERENCES checkin (checkinID)

Normal Form:

BCNF

5. Implementation Details

The implementation of our system involved the following characteristics:

Environment: As our working environment we used “PHP My Admin” in which we tested the functionality of all the pages we built. Different members used different IDE such as: ATOM, PYCHAM, SUBLIME TEXT, to implement their corresponding parts.

Framework: In order to support the development of the website we used Bootstrap 4.1.1 as a basis for building the site and making it user-friendly.

Languages: To develop our system we relied on languages such as:

- Html and CSS in order to build the visual aspect of each page.
- PHP to achieve the connection with the database.
- SQL to build the database.
- Additionally, few JavaScript functions embedded in HTML were utilized for transitional error or confirmation messages.

During our work we faced several implementation challenges in different stages of implementation. The way in which we generally overcame these challenges was by conveying excessive online research among several related platforms and consulting each difficulty with the group members. Specifically, some of the problems were:

- In the process of uploading a photo in the user profile we were not able to make it functional by implementing it inside another page, in this case in the user profile page. In order to avoid this problem, we tried different ways and ultimately decided to implement the page uploading in an individual page which was later used by all the pages that needed it.

- Another issue that we had was with accessing the folders containing user information since it was not working properly and created problems in creating and editing the user profile. To solve this problem, we implemented it in such a way that each user has its own folder in the system.

6. Advance Database Feature

6.1. Views

Manager Suggestion View

This view restricts the manager to access user names that sent suggestions.

```
create view manager_suggestion as
select suggestionID, suggestion_text, suggestion_date, venueID
from suggestion
```

Manager Review View

This view restricts the manager to access user names that wrote the reviews.

```
create view manager_review as
select reviewRating, reviewDescription, checkin_date, venueID
from checkin natural join review
```

6.2. Stored Procedures

The most important operations on our system will be adding venues and check-ins at venues. Therefore, we can use some stored procedures to avoid using long queries all the time.

This procedure will be used to add check-ins to the database.

```
Create Procedure addCheckin
        (@checkinID int, @checkin_date date, @userID int, @venueID int, @reviewID
        int)
As
Begin
        Insert Into checkin
        Values (@checkinID, @checkin_date, @userID, @venueID, @reviewID)
End
```

This procedure will be used to add messages to the database.

```
Create Procedure addVenue
        (@userID1 int, @userID2 int, @message varchar(500), @sent_date date)
As
Begin
        Insert Into messages
        Values (@userID1, @userID2, @message, @sent_date)
End
```

This procedure will be used to add venues to the database.

```
Create Procedure addUser
        (@userID int, @user_firstName varchar(50), @user_lastName varchar(50), @user_email
        varchar(100), @user_password varchar(30), @user_birthdate date, @user_pic blob,
        @user_gender character(1), @city varchar(50), @user_profileType int, @user_created date,
        @user_isActive int, @user_lastlogin time, @typeID int)
As
Begin
        Insert Into user_table
        Values (@venueID, @venueName, @venueDesc, @street_number, @street_name,
                @venueCreated, @venueModified, @venue_open_time, @venue_close_time,
                @venueStatus int, @cityID, @managerID, @cityID, @managerID)
End
```

This procedure will be used to display the number of friends in user's profile

```
Create Procedure countFriends as
Begin
        (SELECT U.userID, count(*)
        FROM user_table U, friends F
        WHERE U.userID = F.userID1
        GROUP BY U.userID)
End
```

6.3. Profile Reports

Total number of check-ins uploaded by each user:

```
SELECT C.userID, count(*)
FROM checkin C
GROUP BY C.userID;
```

Total number of suggestions sent from each user:

```
SELECT S.userID, count(*)
FROM suggestion S
GROUP BY S.userID;
```

Total number of venues for each category

```
SELECT CV.categoryID, CV.categoryName, count(*)
FROM cat_venue CV
GROUP BY CV.categoryID, CV.categoryName;
```

Total number of planToVisit venues from each user

```
SELECT P.userID, count(P.venueID)
FROM PlanToVisit P
GROUP BY P.userID;
```

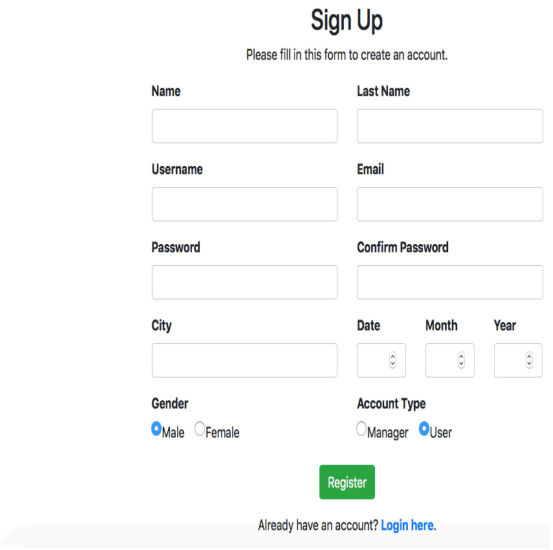
7. User Manual

7.1 Introduction

Welcome to CheckMe, the most awesome and simple platform for finding different locations and sharing your thoughts regarding them with all your online community. In order to make things easier for you we have created this guide to help you get to know with this new and exciting platform!

7.2 Login

The first thing a user will be redirected to when opening the website will be the login page. If you are a first-time user than you will have to go to the registration page and create an account. The creation of an account requires basic information such as: your name, surname, email address, password, birthdate, city and account type.



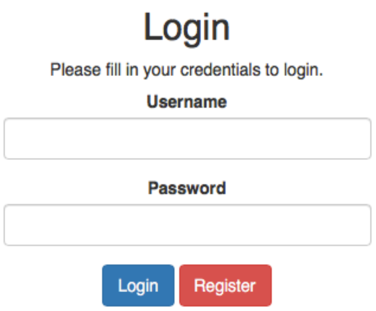
Sign Up

Please fill in this form to create an account.

Gender ● Male ○ Female

Account Type ○ Manager ● User

Already have an account? Login here.



Login

Please fill in your credentials to login.

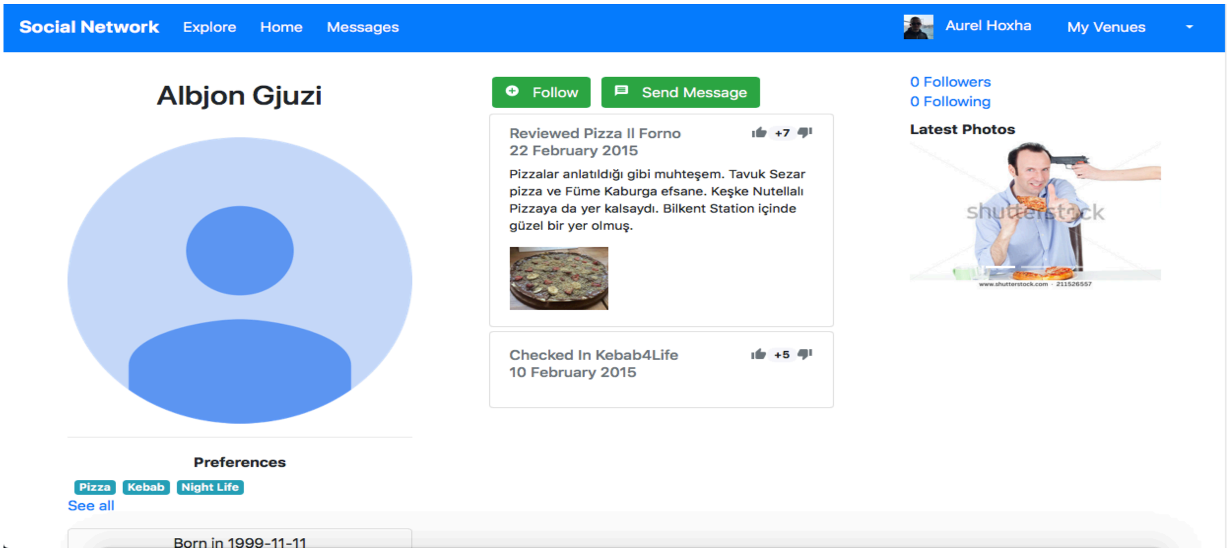
Congratulations! After this step you are now officially a member of the “CheckMe” Community. If you wish to open you account in another time you will be directed to the Login Page. All registered users can login into the system through this simple Login page. In order to login the unique email- address and password determined during registration are required. The validity of both password and email address is checked before user is logged in. After pressing the Log in button user is redirected to his homepage.

7.3 Homepage

In this page a user is able to see information related with his followers such as the venues they have liked or written a review for. In this way you will be updated with all the new information of your “CheckMe” community.

7.4 User Profile

The user profile contains all the necessary information regarding individual users. There you will be able to see relevant information about yourself and others can be able to learn more about you and they can follow and send a message to you. In the profile you will also have the list of the check-ins that you have done together with the number of followers and following that you possess.



Albjon Gjuzi

Reviewed Pizza Il Forno +7
22 February 2015

Pizzalar anlatıldığı gibi muhteşem. Tavuk Sezar pizza ve Füme Kaburga efsane. Keşke Nutellalı Pizzaya da yer kalsaydı. Bilkent Station içinde güzel bir yer olmuş.

Checked In Kebab4Life +5
10 February 2015

0 Followers
0 Following

Latest Photos

Preferences

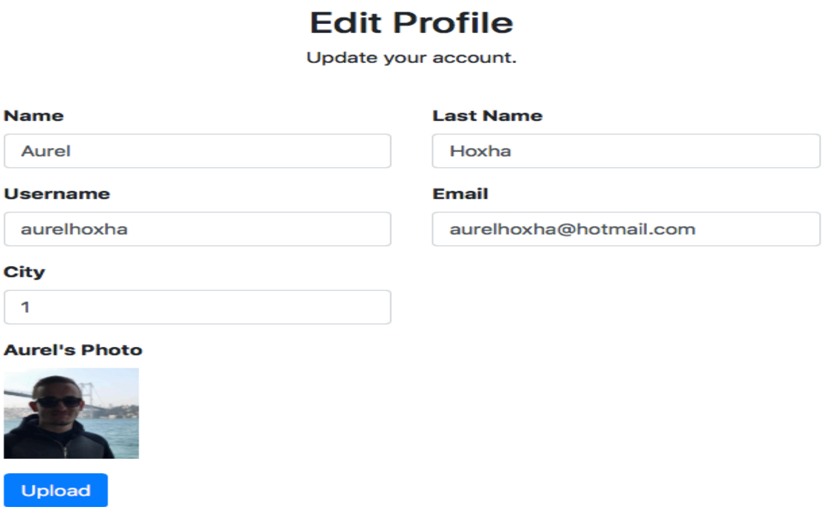
Pizza Kebab Night Life

See all

Born in 1999-11-11

7.5 Change User Profile

This specific page is done in order to update the profile of the user. However some of the information such as gender, birthday are not allowed to be changed once the user has register.



Edit Profile

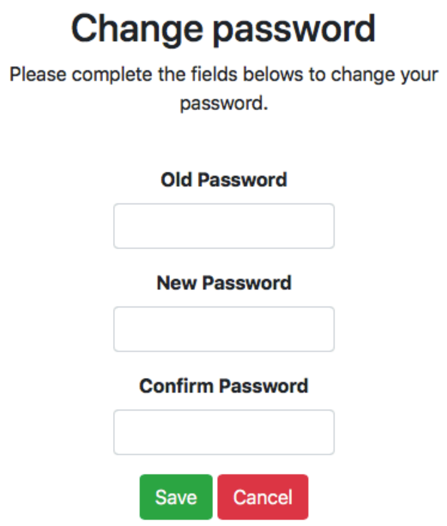
Update your account.

Name	Last Name
Aurel	Hoxha
Username	Email
aurelhoxha	aurelhoxha@hotmail.com
City	
1	

Aurel's Photo

7.6 Change Password

Change Password Page will consist of fields that are necessary to change the user's password. Such fieldsinclude "currentPassword", "newPassword", "confirmPassword".



Change password

Please complete the fields belows to change your password.

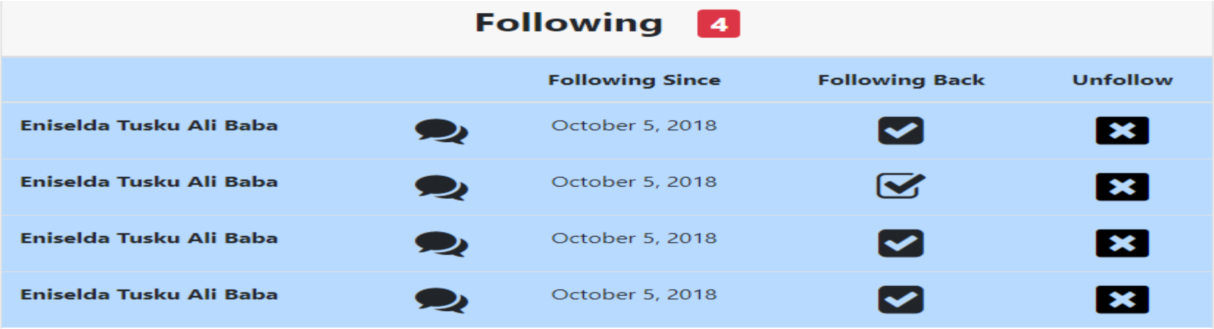
Old Password

New Password

Confirm Password

7.7 Following

In the profile the user can access the list of his followers together with the information such as, the date of follow, option to unfollow , send message and status if the following is mutual.

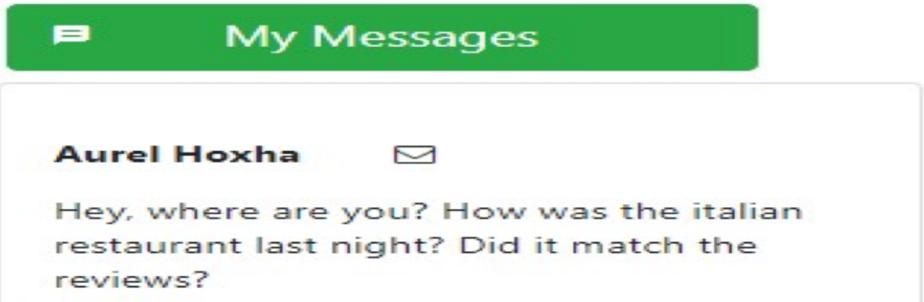


Following 4

		Following Since	Following Back	Unfollow
Eniselda Tusku Ali Baba	💬	October 5, 2018	✓	✖
Eniselda Tusku Ali Baba	💬	October 5, 2018	☑	✖
Eniselda Tusku Ali Baba	💬	October 5, 2018	✓	✖
Eniselda Tusku Ali Baba	💬	October 5, 2018	✓	✖

7.8 List of Messages

Message page will consist of all messages that the user has exchange with different users. From this page the user can be redirected to messages with a particular user or to a new message window.



My Messages

Aurel Hoxha ✉

Hey, where are you? How was the italian restaurant last night? Did it match the reviews?

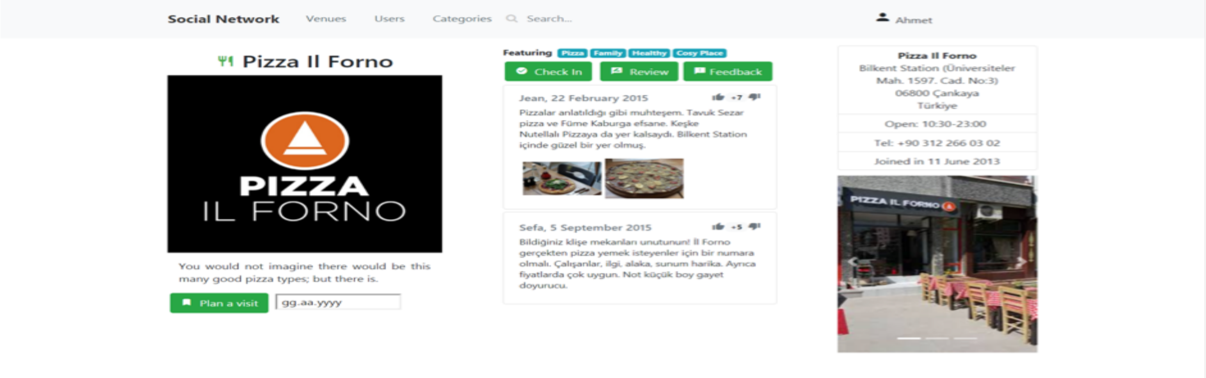
7.9 Send Messages

When the user decides to send a message to another user, the message window will include automatically the name of user, name of the receiver and also will have a field where the user can type his message.

Pic of send message

7.10 Venue

Venue page displays all the information about a specific Venue and Review's regarding that venue. When opening the Venue profile the user can Check In, Review and give feedback (suggestions) to the venue. In addition user can include this venue in his "PlanToVisit" list.



Social Network Venues Users Categories Search... Ahmet

Pizza Il Forno

You would not imagine there would be this many good pizza types; but there is.

Plan a visit | gg.aa.yyyy

Featuring Pizza Family Healthy Cosy Place

Check In | Review | Feedback

Jean, 22 February 2015 +7

Pizzalar anlatıldığı gibi muhteşem. Tavuk Sezar pizza ve Füme Kaburga efsane. Keşke Nutellalı Pizzaya da yer kalsaydı. Bilkent Station içinde güzel bir yer olmuş.

Sefa, 5 September 2015 +5

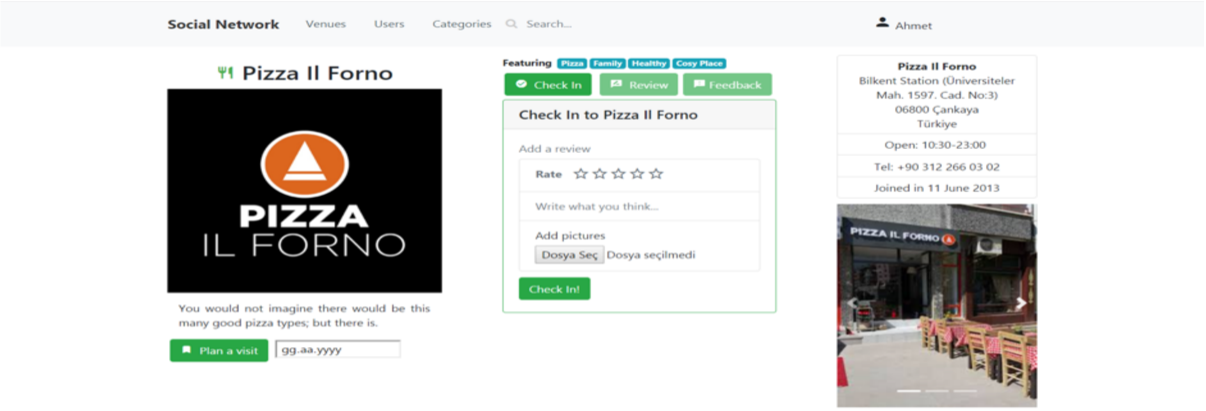
Bildiğiniz klişe mekanları unutunun! Il Forno gerçekten pizza yemek isteyenler için bir numara olmalı. Çalışanlar, ilgi, alaka, sunum harika. Ayrıca fiyatlarda çok uygun. Not küçük boy gayet doyurucu.

Pizza Il Forno
Bilkent Station (Üniversiteler Mah. 1597. Cad. No:3)
06800 Çankaya
Türkiye

Open: 10:30-23:00

Tel: +90 312 266 03 02

Joined in 11 June 2013



Social Network Venues Users Categories Search... Ahmet

Pizza Il Forno

You would not imagine there would be this many good pizza types; but there is.

Plan a visit | gg.aa.yyyy

Featuring Pizza Family Healthy Cosy Place

Check In | Review | Feedback

Check In to Pizza Il Forno

Add a review

Rate ☆☆☆☆☆

Write what you think...

Add pictures

Dosya Seç | Dosya seçilmedi

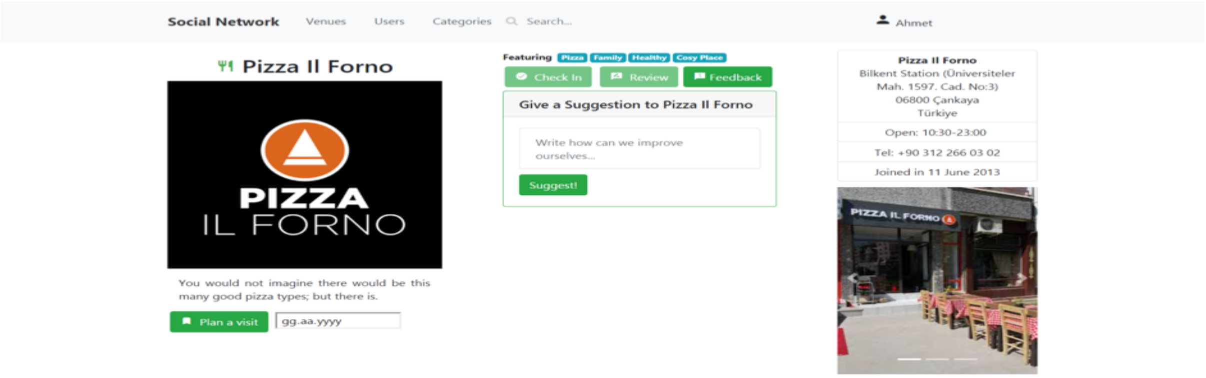
Check In!

Pizza Il Forno
Bilkent Station (Üniversiteler Mah. 1597. Cad. No:3)
06800 Çankaya
Türkiye

Open: 10:30-23:00

Tel: +90 312 266 03 02

Joined in 11 June 2013



Social Network Venues Users Categories Search... Ahmet

Pizza Il Forno

You would not imagine there would be this many good pizza types; but there is.

Plan a visit | gg.aa.yyyy

Featuring Pizza Family Healthy Cosy Place

Check In | Review | Feedback

Give a Suggestion to Pizza Il Forno

Write how can we improve ourselves...

Suggest!

Pizza Il Forno
Bilkent Station (Üniversiteler Mah. 1597. Cad. No:3)
06800 Çankaya
Türkiye

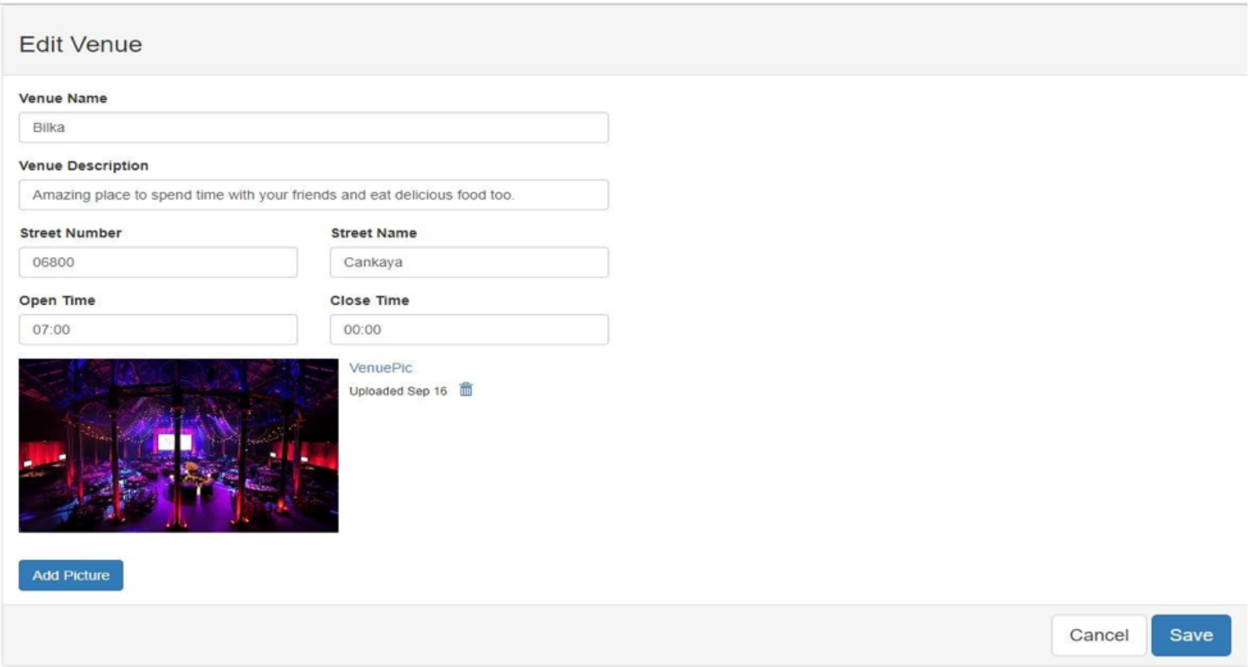
Open: 10:30-23:00

Tel: +90 312 266 03 02

Joined in 11 June 2013

7.11 Edit Venue

When a manager open Edit Profile of a Venue he/she will have the opportunity to change the information of the venue.



Edit Venue

Venue Name: Bilka

Venue Description: Amazing place to spend time with your friends and eat delicious food too.

Street Number: 06800

Street Name: Cankaya

Open Time: 07:00

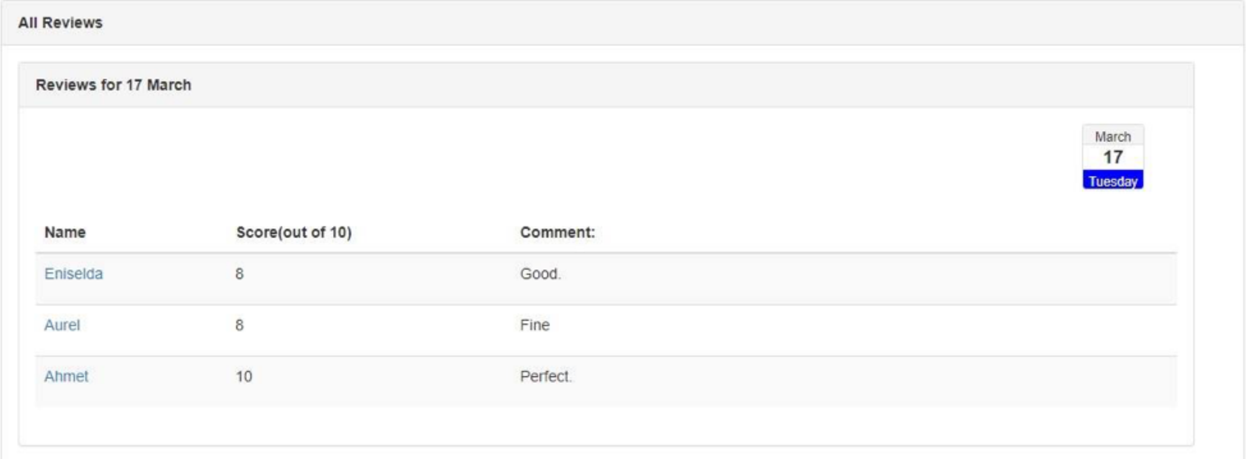
Close Time: 00:00

VenuePic

Uploaded Sep 16

7.12 Rating

When a manager checks the reviews that the users have written for the venue under management the manager will have the opportunity to check all the reviews the users have written.



All Reviews

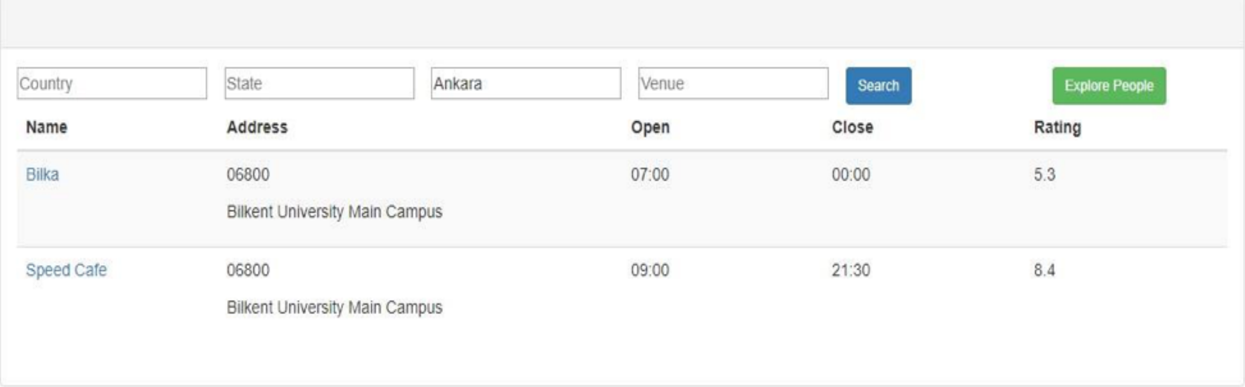
Reviews for 17 March

March
17
Tuesday

Name	Score(out of 10)	Comment:
Eniselda	8	Good.
Aurel	8	Fine
Ahmet	10	Perfect.

7.13 Explore

The main idea of the project is to search for a venue based on your preferences. This will be achieved from Explore Page where the user will be able to refine the search based on different buttons and characteristics of the venue looking for.

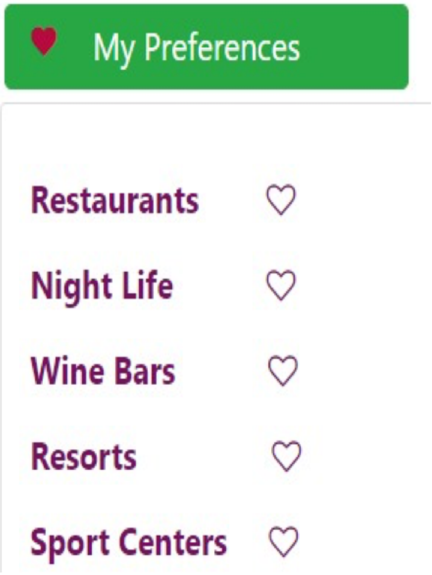


Country | State | Ankara | Venue | Search | Explore People

Name	Address	Open	Close	Rating
Bilka	06800 Bilkent University Main Campus	07:00	00:00	5.3
Speed Cafe	06800 Bilkent University Main Campus	09:00	21:30	8.4

7.14 Lists

User has the opportunity to view lists of his preferences such as “Favorite Venues” and the venues that he/she has marked as “PlanToVisit”. The lists can be updated by user by removing existing venues in each of them



My Preferences

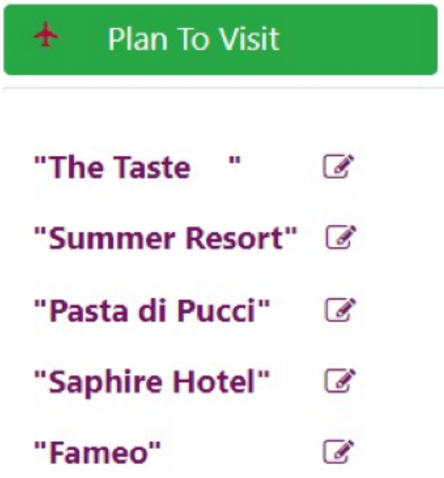
Restaurants ♡

Night Life ♡

Wine Bars ♡

Resorts ♡

Sport Centers ♡



Plan To Visit

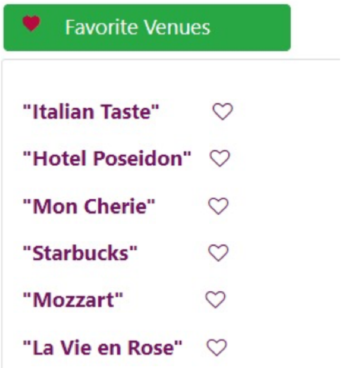
"The Taste "

"Summer Resort"

"Pasta di Pucci"

"Saphire Hotel"

"Fameo"



Favorite Venues

"Italian Taste" ♡

"Hotel Poseidon" ♡

"Mon Cherie" ♡

"Starbucks" ♡

"Mozzart" ♡

"La Vie en Rose" ♡