

DBMS Project

Soccer Field Reservation Management System

By: Gabriel Ferreyra

1. INTRODUCTION

My project is to create an application to emulate a management system where employees who are overseeing a soccer field facility can use the system to keep an organized and consistent database of the reservations of their playing fields, the field openings available for customers to reserve and general customer information for contacting them/keeping a organized record of customers. When I personally attempted to reserve a field at one of these facilities, their inability to acknowledge and keep a record of my reservation made me realize these facilities only use “word of mouth” type of keeping records where they simply just try to remember if someone has reserved a field and who reserved it. This lack of a management system has caused them to lose the reservation information and caused a lot of problems when trying to reserve a field. Ultimately, this project is aimed to fix that problem.

My project has **seven** modules. (1)The ability to view customer information and (2, 3)add/remove customers from the database; (4)the ability to view current fields that are open to reserve and (5)add new future openings; (6)the ability to reserve a field opening and (7)remove/cancel that reservation if needed.

2. SYSTEM STUDY

2.1. Proposed system

The application is a very simple design and was easy to implement the database side of the application due to simple, easy to follow relationships between the entity sets. It can run on practically any system/computer and is designed to be run as a desktop application; NOT an online application. (STRICTLY for administrator/employee use)

It has got following **features**:

- Ensure data accuracy for customer records, reservation information, and field opening information.
- Records are efficiently maintained by a MySQL DBMS system that is connected to by the application and updated/run concurrently.
- DBMS provides a means of keeping all the information/data organized and secure from system failures.

- ONLY the employees may have access to the application.
- Field opening availability can be viewed very quickly/easily.
- Reservations can be created quickly/easily and be removed just as well.
- Changes to database through application happen extremely fast so no wait time on seeing your edits/additions/removals.
- DEFINITELY a better system to keeping reservation records instead of “word of mouth” type of keeping records that these facilities partake in.
- Ultimately helps keep records of the information in a quicker and more organized way so problems with forgetting current reservations or mistaking a field opening to be occupied will be avoided.

2.2. Introduction about the front end (JAVA)

This proposed software is going to be development using the latest technology from Oracle called Java SE Development Kit 8 and it is the software creates a VM of a java program and allows you to program in the java language and compile/run the program on Windows operating system. The Java SE Development Kit 8 used for building and running all kinds of software, including Web-based applications, desktop applications, Mobile applications, etc.

- **The development kit used was Netbeans v8.1 which is an IDE software that allows you to create and develop an application using the Java programming language/development kit. The entire front-end application (where you navigate through the application menus, view all the information and access the modules/functions) was created, compiled, tested and finally exported as a desktop application on this Netbeans IDE software.**

2.3. Introduction about the back end (MySQL Community Server 5.7.9)

MySQL is a freely available open source Relational Database Management System (RDBMS) that uses Structured Query Language (SQL). SQL is the most popular language for adding, accessing and managing content in a database. It is most noted for its quick processing, proven reliability, ease and flexibility of use. MySQL provides you with a suite of tools for developing and managing business critical applications on Windows.

- MySQL is a popular choice of database for use in web applications, and is a central component of the widely used LAMP open source web application software stack. LAMP is an acronym for "Linux, Apache, MySQL, Perl/PHP/Python" Free-software-open source projects that require a full-featured database management system often use MySQL.
- MySQL is also used in many high-profile, large-scale websites, including Google (though not for searches), Facebook, Twitter, Flickr, and Youtube.

3. SYSTEM SPECIFICATION

3.1. Hardware Requirements:

- Processor: **Minimum Pentium 2 266 MHz processor**
- RAM: **128 MB or above**
- Disk space: **124 MB for JRE; 2 MB for Java Update (plus 4 KB of space for application itself)**

3.2. Software Requirements:

- Operating system: **Windows Vista SP2 (or above)**
- Front end: **Java SDK Development Kit**
- Integrated Development Environment: **Netbeans v8.1**
- Back end: **MySQL Community Server v5.7.9**

4. DATABASE DESIGN

4.1. Conceptual design

a.) Requirement Analysis:

What data is needed?

List of Entities:

- Customer
- Fields
- Openings
- Available
- Reservations
- Currentreservations(View)
- Currentopenings(View)
- Login(not interacting with rest of database, strictly to keep a record of userID and password combinations for the admin accounts)

List of attributes:

Customers:

1. CID
2. Name
3. Address
4. Email
5. Phone

Fields:

1. FID
2. Type
3. Size

Openings:

1. OID
2. Date
3. Start_Time
4. End_Time

Reservations:

1. RID
2. CID
3. OID

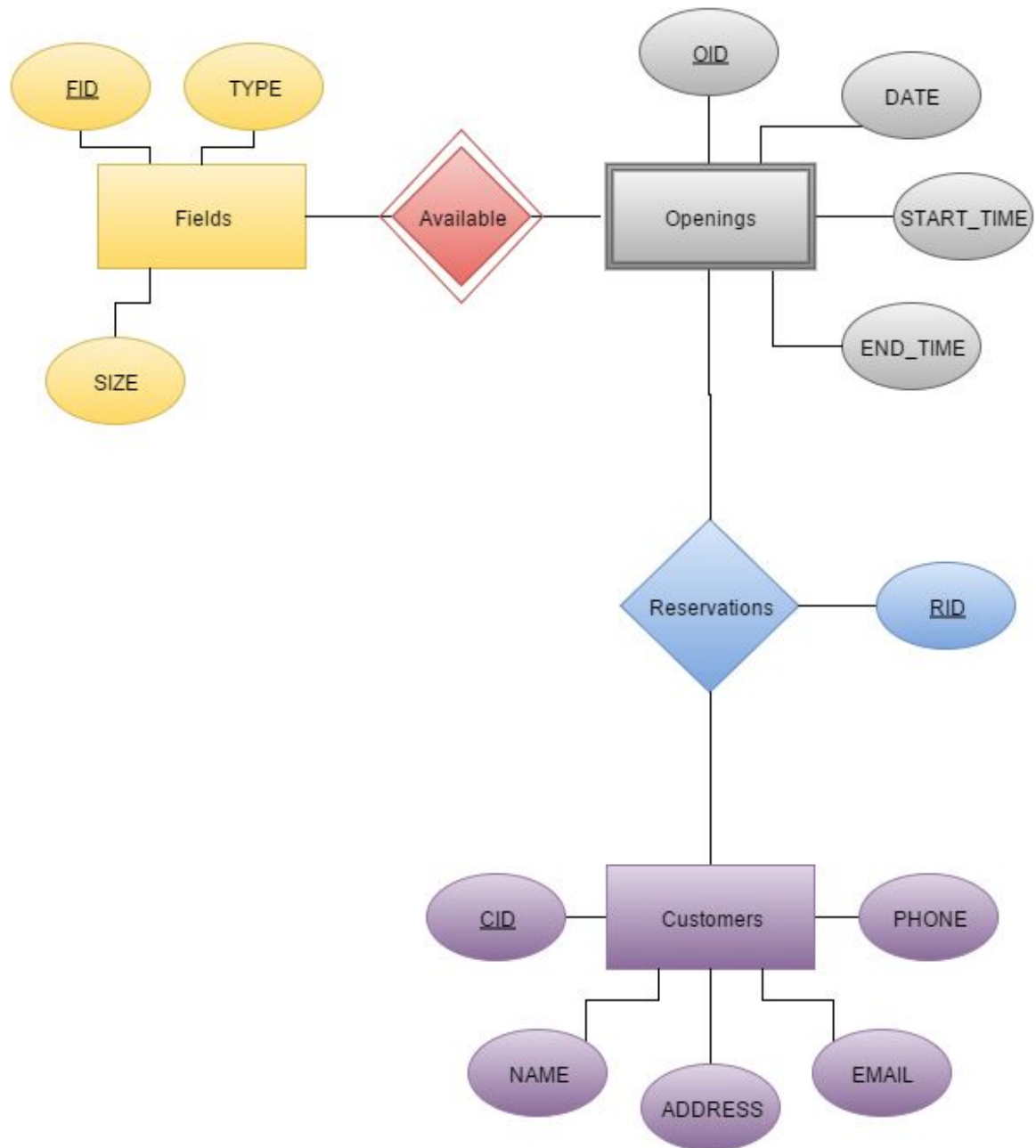
Available:

1. FID
2. OID

Login:

1. UserID
2. Password

b.) ER-MODEL:



4.2. Logical design:

1. CUSTOMER: Keeps record of Customers

S.no	Field name	Data type	Description	Constraints
------	------------	-----------	-------------	-------------

1	CID	Integer	Customer identity number	Primary key
2	Name	varchar(50)	Name of the Customer	
3	Address	varchar(50)	Mobile number of the passenger	
4	Email	varchar(50)	Email of the Customer	
5	Phone	varchar(50)	Phone# of the Customer	

Schema definition:

CREATE TABLE Customers(CID integer primary key, name varchar(50), address varchar(50), email varchar(50), phone varchar(50));

2. Openings: Keeps record of available field openings

S.no	Field name	Data type	Description	Constraints
1	OID	Integer	Opening identity number	Primary key
	FID	Integer	Field identity number	Foreign key
2	Date	varchar(50)	Date that field is open	
2	Start_Time	varchar(500)	Starting time for opening	
3	End_Time	varchar(50)	Ending time for opening	

Schema definition:

CREATE TABLE Openings(OID integer primary key, FID integer, Date varchar(50), Start_Time varchar(50), End_Time varchar(50), foreign key (fid) references Fields(fid));

3. Reservations: Reservation table.

S.no	Field name	Data type	Description	Constraints
1	RID	Integer	Reservation number	Primary key
2	CID	Integer	Customer identify number	Foreign key
3	OID	Integer	Opening identity number	Foreign key

Schema definition:

CREATE TABLE Reservations(RID integer primary key, CID integer, OID integer, foreign key (cid) references Customers(cid), foreign key (oid) references Openings(oid));

4. Fields: Field details.

S.no	Field name	Data type	Description	Constraints
1	FID	Integer	Field identity number	Primary key
2	Type	varchar(50)	Type of field	
2	Size	varchar(50)	Size of field	

Schema definition:

CREATE TABLE Fields(FID integer primary key, Type varchar(50), Size varchar(50));

5. Available(now **obsolete** since I combined the FID foreign key into the Openings table to reference the FID in Fields table)

S.no	Field name	Data type	Description	Constraints
1	FID	Integer	Fields identity number	Foreign key
2	OID	Integer	Openings identify number	Foreign key

Schema definition:

CREATE TABLE Available(FID integer, OID integer, foreign key (fid) references Fields(fid), foreign key (oid) references Openings(oid));

6. Login(not interacting with rest of Database)

S.no	Field name	Data type	Description	Constraints
1	LID	Integer	Fields identity number	Primary Key
2	UserID	varchar(50)	Account name of the user	
3	Password	varchar(50)	Password of the userID	

Schema definition:

CREATE TABLE Login(LID integer primary key, UserID varchar(50), Password varchar(50));

7. CurrentOpenings(View)

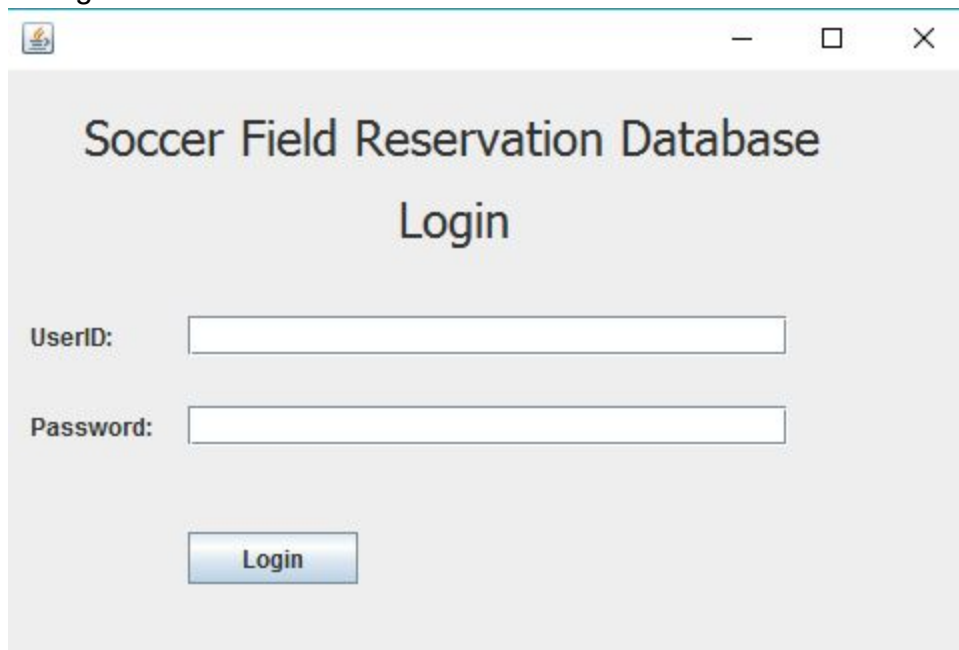
--Created from the query "SELECT OID, FID, DATE, START_TIME, END_TIME FROM Openings WHERE (NOT EXISTS (SELECT * FROM RESERVATIONS AS R WHERE R.OID = O.OID));" to display currently available openings quickly.

8. CurrentReservations(View)

--Created from the query "SELECT DISTINCT name, fid, date, time FROM Customers AS C, Reservations as R, Openings as O WHERE R.CID = C.CID AND R.OID = O.OID" to display currently held reservations quickly.

5. IMPLEMENTATION

0. Login Menu



The screenshot shows a Windows-style application window titled "Soccer Field Reservation Database Login". The window has a standard title bar with a minimize button, a maximize button, and a close button. The main content area has a light gray background. At the top, the text "Soccer Field Reservation Database" is displayed in a large, bold, black font. Below it, the word "Login" is displayed in a slightly smaller, bold, black font. There are two input fields: one for "UserID:" and one for "Password:". Both fields are rectangular with a thin border. Below the input fields is a "Login" button with a blue gradient and a black border.

0. Main Menu

Soccer Field Reservation Database

Description:

Customer Information

View personal records of current customers

Field Openings

View field openings that are available to reserve

Reservations

View currently held field reservations

Log Off

1. Viewing Customer information - Used to view customer information for use of record keeping and contacting

Customer Personal Information

Name	Address	E-Mail	Phone
Gabriel Ferreyra	12607 Brenhaven Dr.	gqf001@shsu.edu	832 661 3812
Luisa Quinones	555 Bowers Blvd.	lfq001@shsu.edu	832 381 4229
Jacob Maya	676 Briarcreek Ln.	maya007@yahoo.com	737 373 3273
John Doe	555 Nowhere Dr.	doe22@yahoo.com	948 484 4849
Mickey Donald	453 Disney Rd.	mm002@shsu.edu	884 484 4888
Lourdes Santos	234 Rainbow Rd.	ls220@hotmail.com	949 846 2622
Jairo Perez	656 Briarcreek Ln.	perez48@hotmail.com	233 3468 4373
Lionel Messi	3432 Barca Ct.	barcelona10@gmail.com	848 377 7366
Esther Palermo	8484 Main St.	2kool4skool@yahoo.com	939 635 5537
Greg Gears	7474 Main St.	grindingthegears@hotmail.com	547 474 3837
Anthony Vu	8858 Water Ln.	anhtoeknee@gmail.com	347 573 2229
Test	555 Test Ln.	test@yahoo.com	555 555 5555
Test2	666 Test Ln.	test2@yahoo.com	555 555 5555

Insert

Delete

Refresh

Back

2. Adding Customer information - Used to add a new customer's information to database

Enter the CUSTOMER's information below:

Name:

Address:

E-mail:

Phone:

3. Removing Customer information - Used to remove a customer's information from database that is no longer needed or that needs to be updated

Customer Personal Information

Gabrie
Luisa
Jacob
John
Micke
Lourd
Jairo
Lionel
Esthe
Greg
Antho
Test

Enter full name and e-mail of the customer you wish to delete:

Name:

E-Mail:

4. View current field openings - Used to view the current field openings that are available to reserve

Available Field Openings

Field	Date	Start Time	End Time
3	03/17/15	9:30 PM	10:30 PM
2	03/18/15	8:30 PM	9:30 PM
3	03/18/15	10:00 PM	11:00 PM
1	03/19/15	12:00 AM	1:00 PM
2	03/19/15	10:00 PM	11:00 PM
3	03/19/15	8:30 PM	9:30 PM
1	03/20/15	12:00 AM	1:00 AM
2	03/20/15	2:00 PM	3:00 PM
1	03/21/15	1:00 PM	2:00 PM

Create Reservation **Refresh** **Back**

Create New Opening

5. Add a new field openings - Used to add a new future field opening that will be available to reserve

Enter the field, date and time for the new opening you wish to create:

Field:

Date:

Start Time:

End Time:

Insert **Back**

6. View currently held reservations - Used to view reservations that are already held by a customer



Current Field Reservations


Name	Field	Date	Start Time	End Time
Gabriel Ferreyra	2	03/15/15	9:00 PM	10:00 PM
Luisa Quinones	3	03/15/15	10:00 PM	11:00 PM
John Doe	1	03/18/15	12:00 AM	1:00 AM
Lourdes Santos	1	03/15/15	12:00 AM	1:00 PM
Jairo Perez	2	03/16/15	8:30 PM	9:30 PM
Lionel Messi	3	03/16/15	9:30 PM	10:30 PM
Esther Palermo	2	03/17/15	9:00 PM	10:00 PM
Greg Gears	1	03/16/15	12:00 AM	1:00 AM

Delete

Refresh

Back

- Remove/cancel a reservation - Used to remove a reservation that a customer has made



Enter the reservation information below:

Name:

Field:

Date:

Start Time:

Delete

Back