The University of Texas at Dallas
Department of Computer Science

CS 6360.003 Database Design

Online Airport System

Final Report

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3. INTRODUCTION

3.1 Purpose

Main objective of this project is to build the Online Airport system to organize information about Airplanes stationed and maintained at the airport. This document describes the requirements, functionalities provided for the users by the system. The intended audience for this document are the users of the Online Airport System like technicians, employees, traffic controller and the Administrator.

3.2 Overview

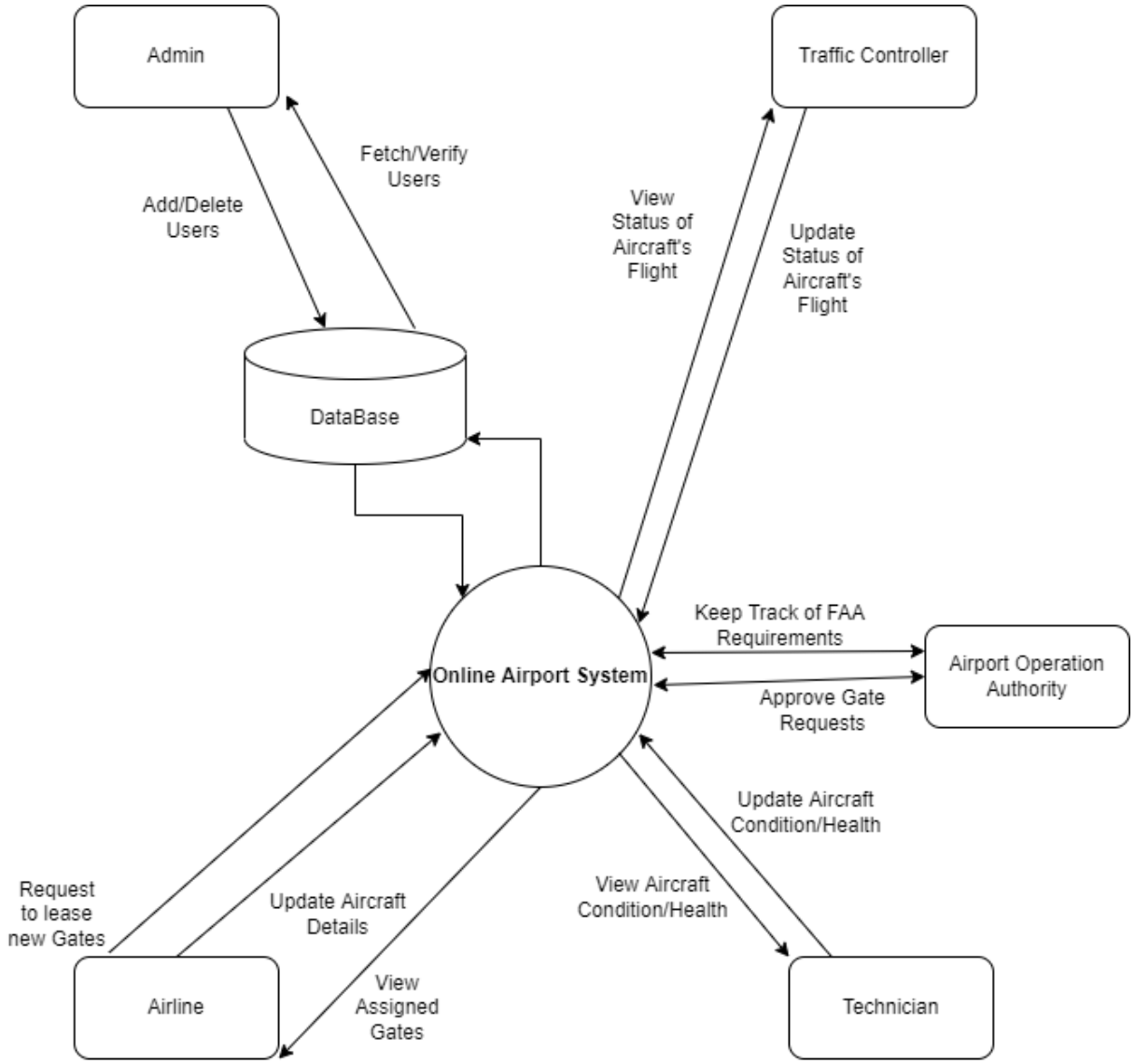
The Online Airport system provides information about every airplane's details like registration number, model, capacity. It also gives insight on technicians, traffic controllers and other employees working at the airport. Additionally, it also maintains the records regarding Airplane's test and quality.

The Online Airport System(OAS) allows users (Employees of the Airport) to create and use their account through it. It provides access to the information about the airplanes based on their designation which includes, Technicians who can login and update personal as well as the test and quality details of the aircrafts they are assigned to, Traffic controllers who can update annual medical examination reports and aircraft flight status.
The Airport Operations Authority keeps track of the information regarding the tests conducted on airplanes to check the airplane's airworthiness as per Federal Aviation Administration(FAA) guidelines and approves gate requests from Airlines who can view, update aircraft information and request to lease gates. Finally, The OAS allows the admin to manage the employees, airline and test details.

4. SYSTEM REQUIREMENTS

4.1. Context Diagram

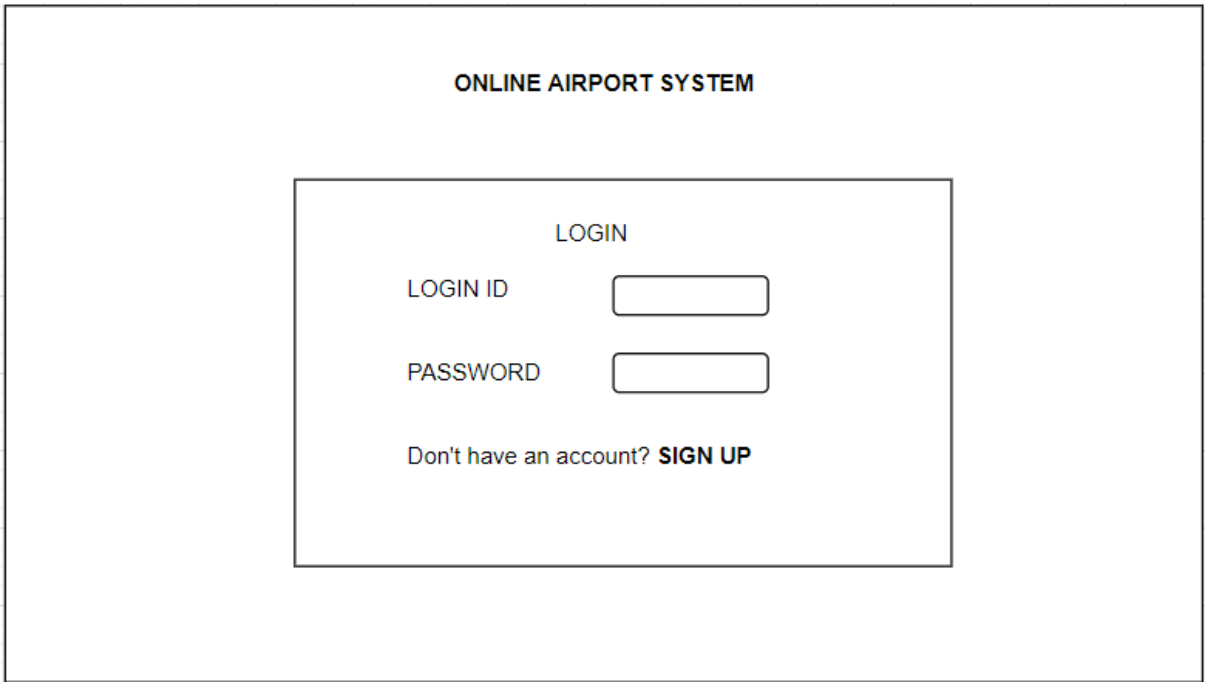
The Context Diagram shows the system under consideration as a single high-level process and then shows the relationship that the system has with other agents interacting with the system.
Below is the context diagram of the Online Airport System :-



4.2 Interface Requirements of the system (or subsystem)

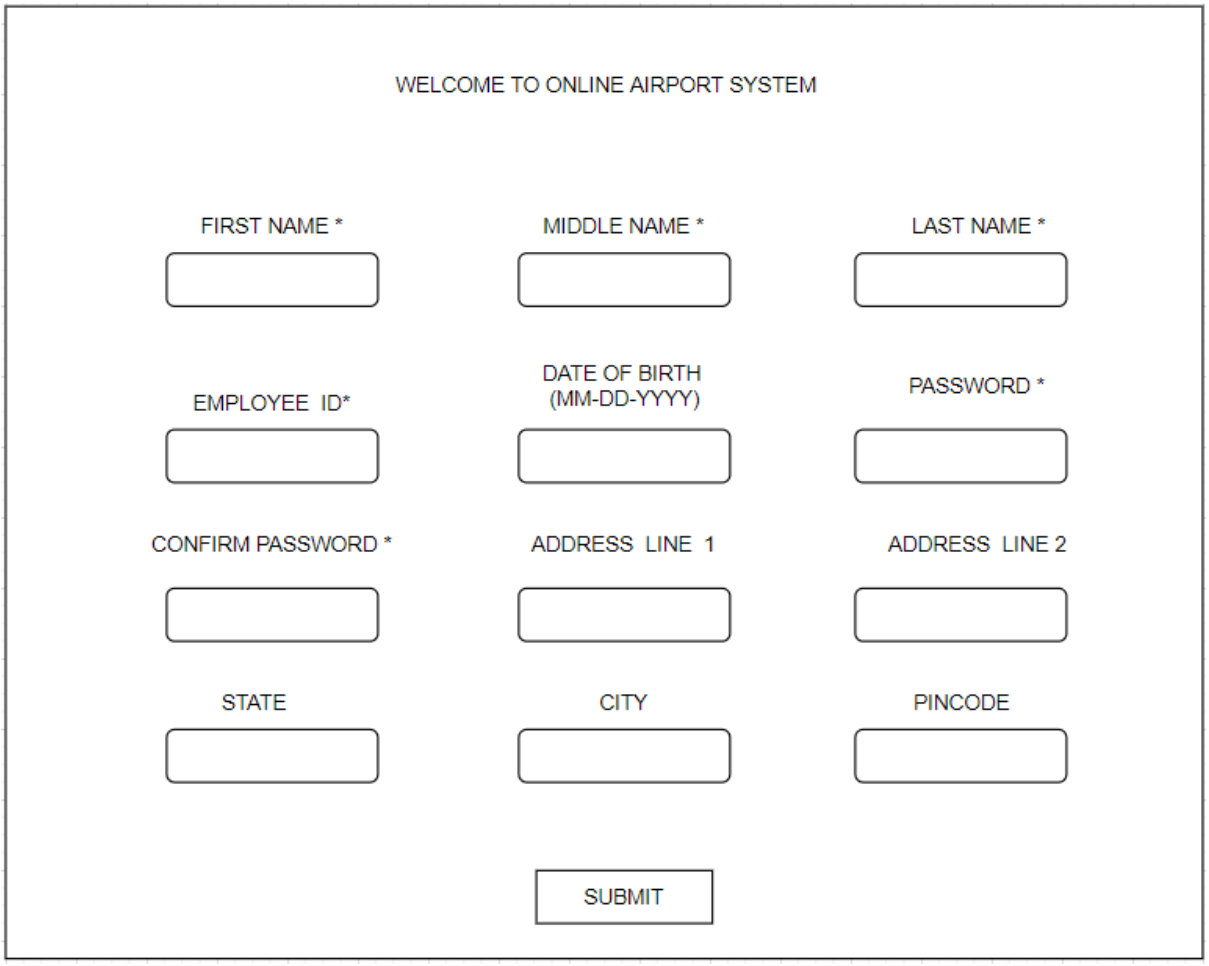
The index page for the application is login page (a). Upon giving the LoginID and password the user can log in.
To create a new employee login, there is an option to sign up, which lands the user on page (b).

a. Login Page



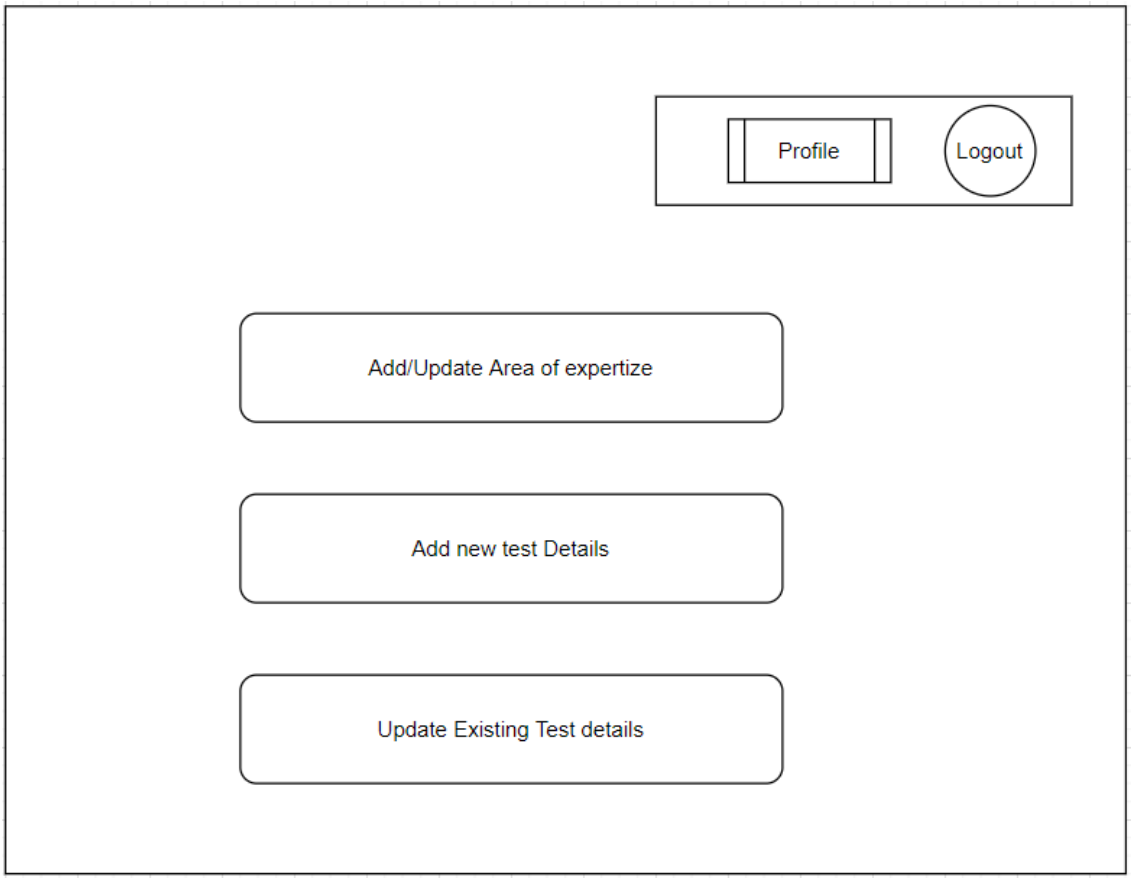
During signup, the user should enter all the mandatory fields(mentioned with an asterisk (*) symbol) as shown in figure 4.2, and upon clicking on the “submit” button the user will be able to sign up.

b. Signup Page



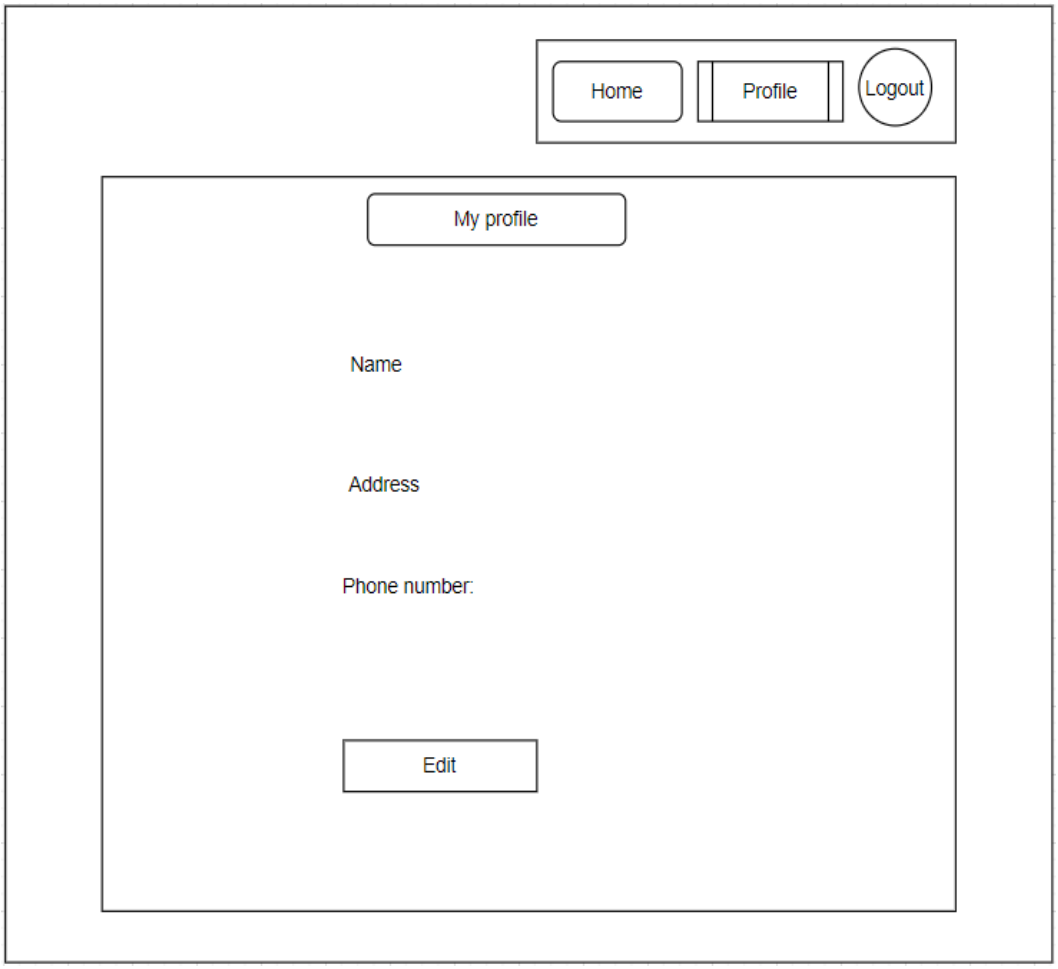
Technician main page is shown in figure (c), he can perform the operations listed by clicking the respective buttons (for ex: technician can add the test details of a new test by clicking on the " Add new test details" button and he will be landed on the page shown on figure (e))

c. Technician Main Page

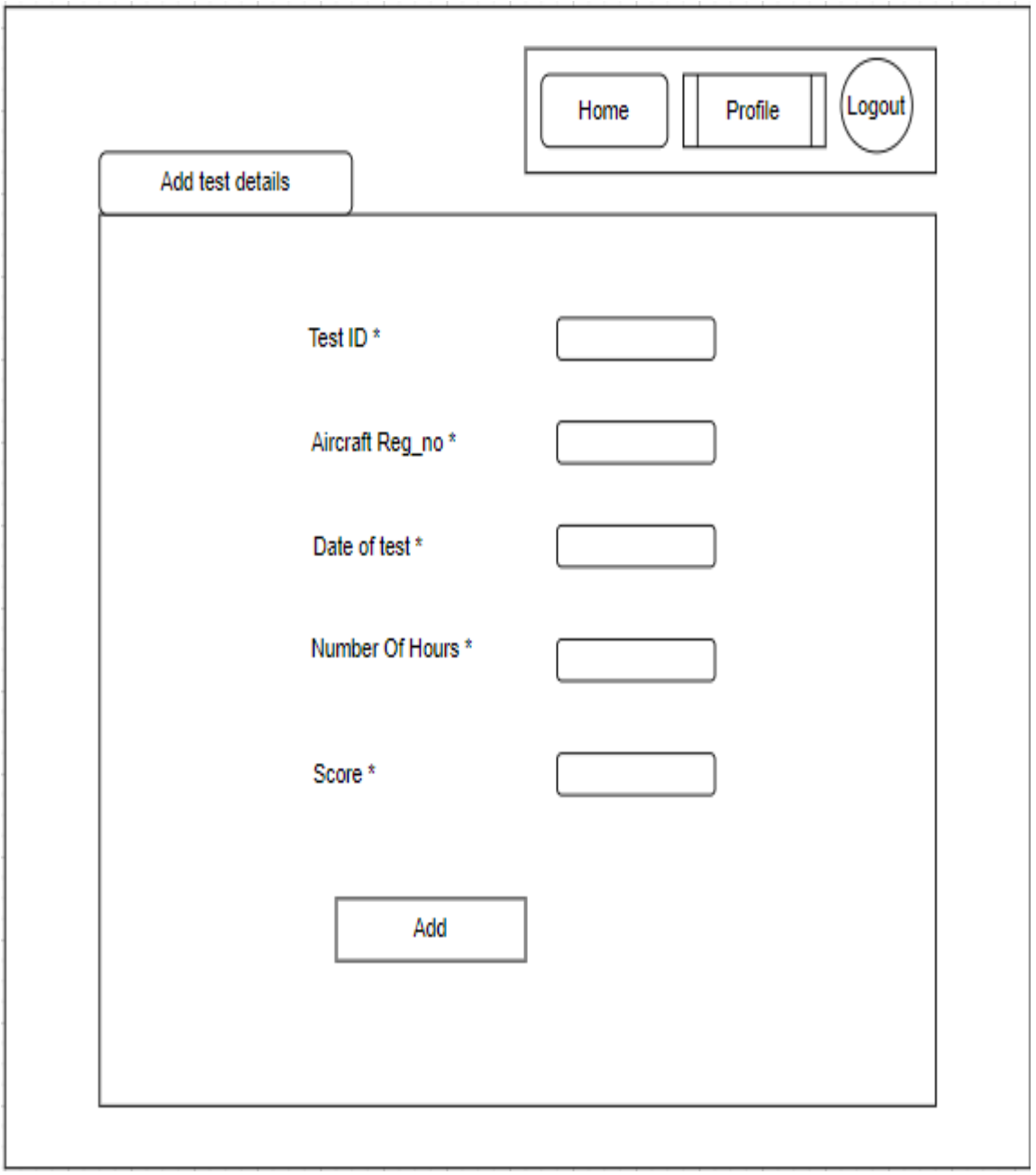


All the employees including the technician can view their profile details by clicking on the " profile " on the navigation bar. There is an option to edit the details like and phone number by clicking on the edit button as shown in figure (d).

d. Technician profile page

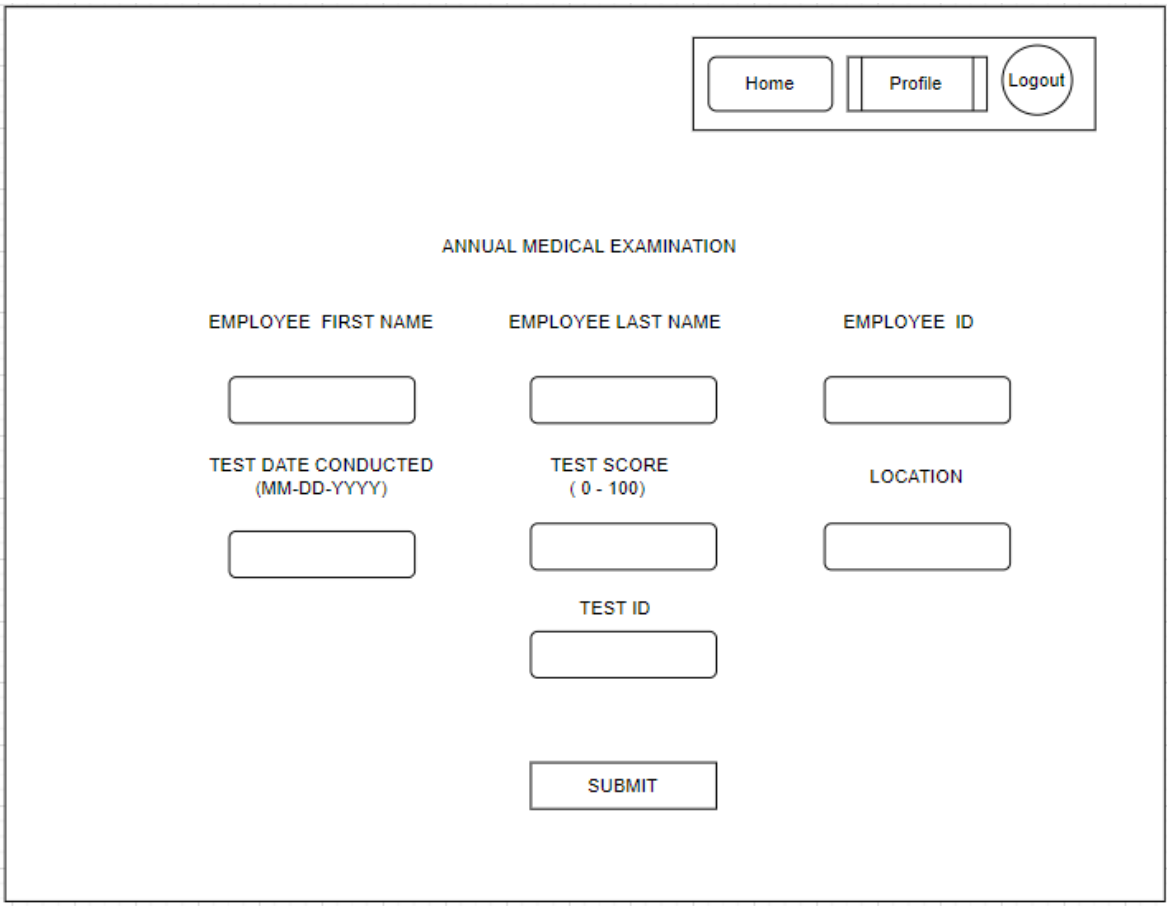


e. Technician - add test details page



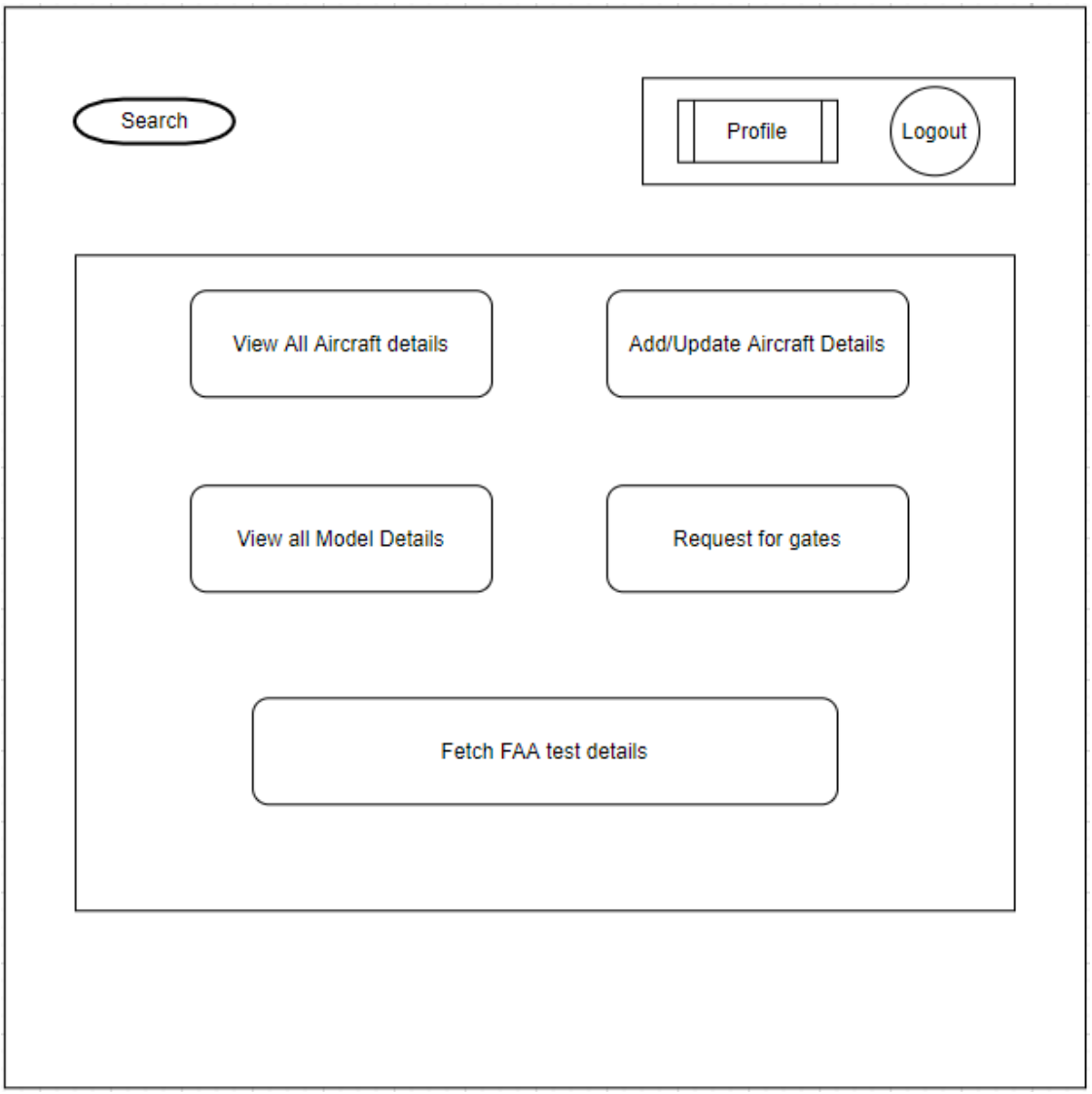
The traffic controller can add his annual medical exam details on the page shown in figure (f) and submit them by clicking on the “ submit “ button.

f. Traffic Controller - Annual medical exam Page



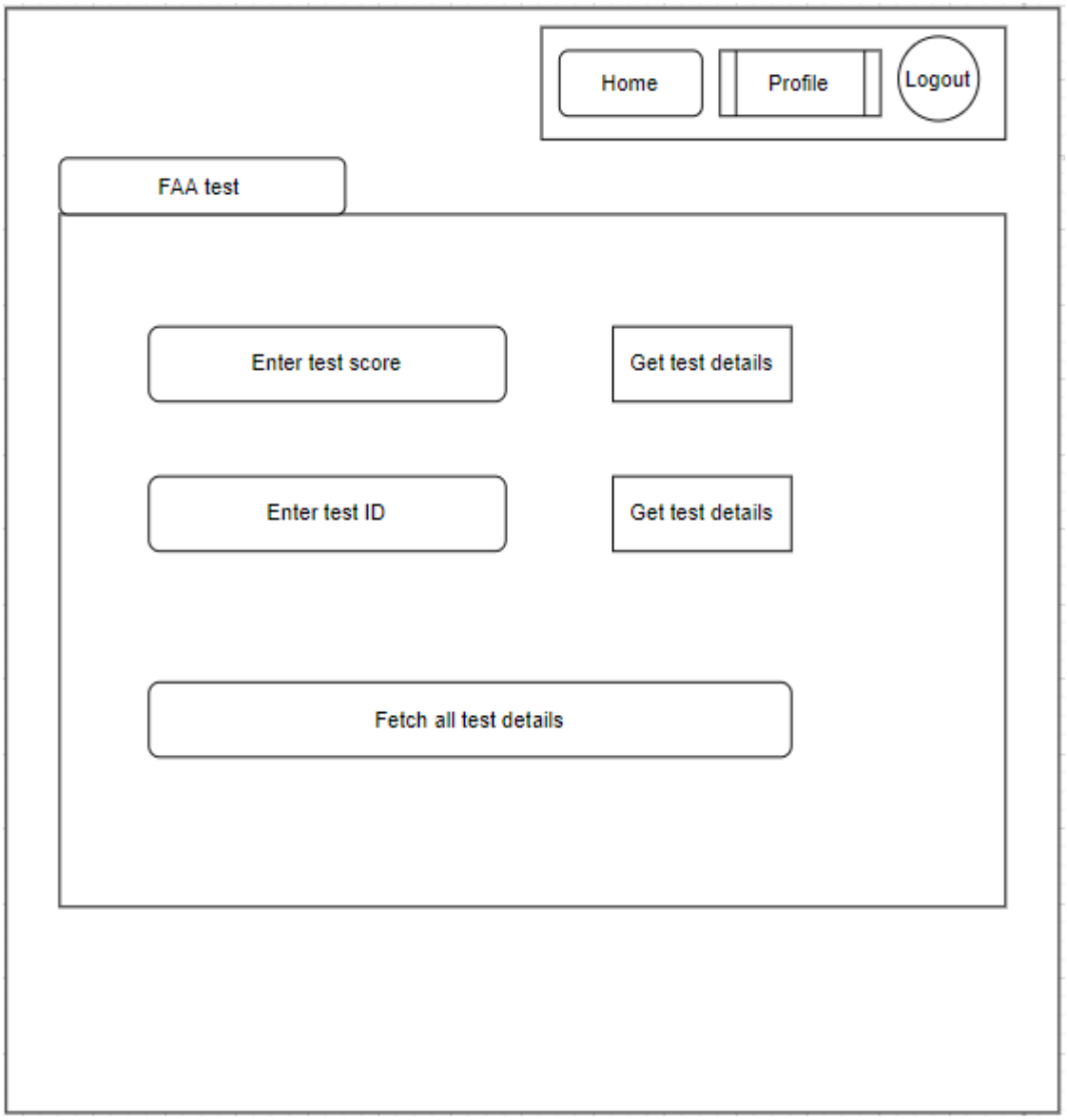
AOA's main page is as shown in figure (g), it has the options for various functions that AOA can do, by clicking on the respective button they can perform the operations.

g. Airport Operations Authority - Main page



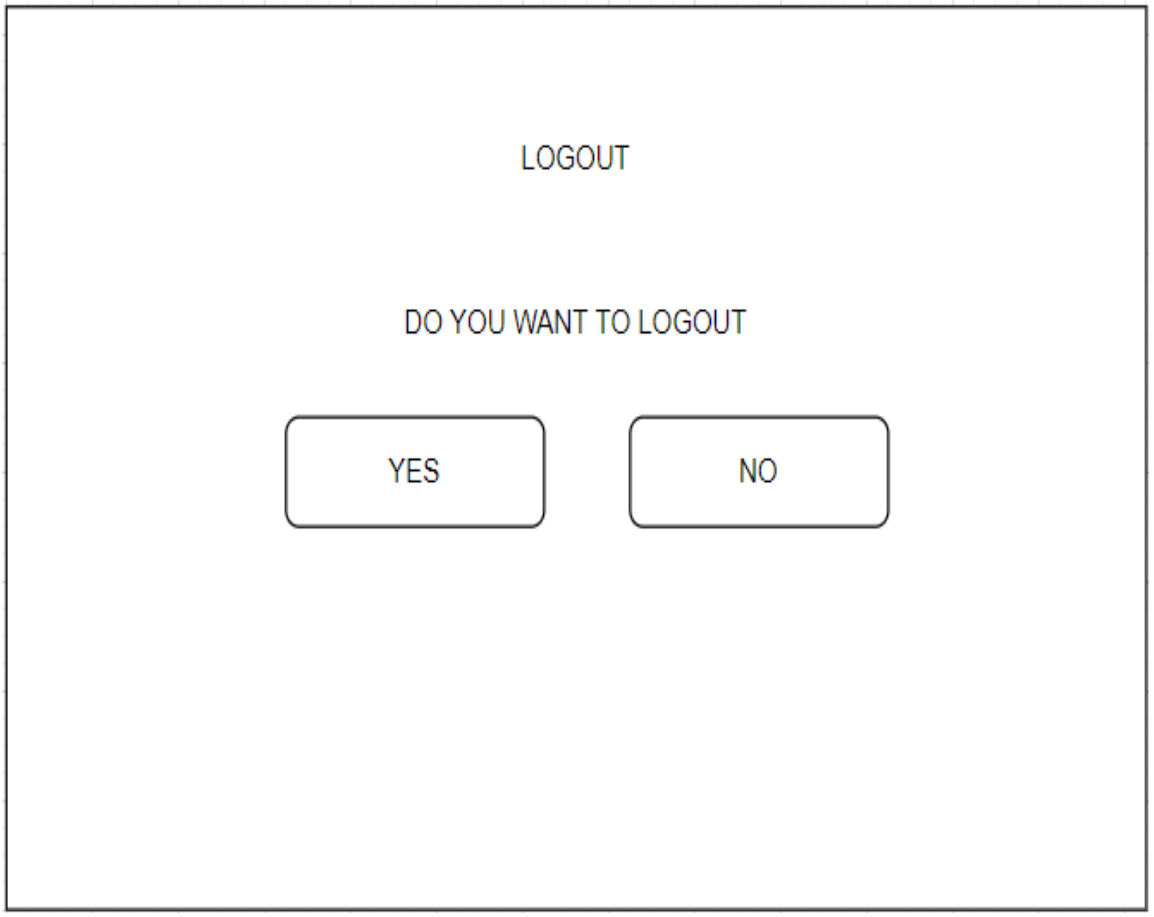
As said earlier, AOA can perform the actions related to the FAA test as shown below in (h). AOA can enter the test score and click on the " get test details " button to get the details of the aircraft with a score greater or equal to the entered quantity. They can fetch the details of the specific test detail by giving the test id or can fetch all the test details by clicking on the " Fetch all test details " button.

h. Airport Operations Authority - FAA test details page



All the users have the logout button in the navigation bar, once it's clicked the below dialog button appears as in figure (i), and if the user chooses “yes”, then he will be logged out, if the user clicks on the “no” button then he will be in his home page and no logout occurs.

i. Logout Page



4.3 Functional Requirements

4.3.1 Login Functional Requirements:

The basic features that are offered by Online Airport System as part of login functionality for OAS users belong to this category. The login functional requirements that are available for users are as listed below.

1. The system will allow the user to log in.
2. The system will verify the username and password.
3. The system will not allow the user to log in with an invalid username or password.
4. The system will be able to remember usernames and passwords.
5. The system will allow users to create accounts.
6. The system will enable users to log out of their accounts

4.3.2 Browsing Functional Requirements:

The functional requirements that are needed to make it accessible from the browser, for the users who access the Online Airport System through the browser are listed below.

1. Technician should be able to add/update his area of expertise.
2. Technicians are allowed to update the aircraft test details he worked on.
3. Traffic controller can update about his annual medical examination details.
4. Employees can access his profile details.
5. Employee can update his profile details (eg: Address, phone number)
6. The authority will have access to all the current airplane's details and model details.
7. The system gives access to the Airport Operation Authority to fetch all the tests done and its details.
8. The system allows the Airport Operation Authority to fetch details of the airplanes which have a particular maximum score in a test to verify if an aircraft is airworthy.
9. The system allows the Airport Operation Authority to fetch the details of any particular test, given he has the test_number.
10. The system allows the airlines to add/update the details of its aircrafts.
11. The system allows each airline to request for gates and gives the airport the Authority to do so.

4.3.3 Administrator Functional requirements:

The administrator is responsible for creating and maintaining the database, and also has the authority and access to the database to modify as needed. Below are the administrator functional requirements for the Online Airport System.

1. The admin can add/delete the users.
2. The admin can fetch or verify the user details
3. The admin can check/update the aircraft details.
4. The admin can add/update the model details.
5. The admin can update the salary of the users(technician, ground staff etc.)
6. The admin can fetch the details of which technician tested any particular aircraft.

7. The admin should maintain/verify the record of the annual medical examination of the Traffic controller.
8. The admin should assign every employee(technician and traffic controller) to a union.
9. The admin can assign/update the gates to which the aircraft should belong to.
10. The admin can fetch/verify the FAA tests done on aircrafts.

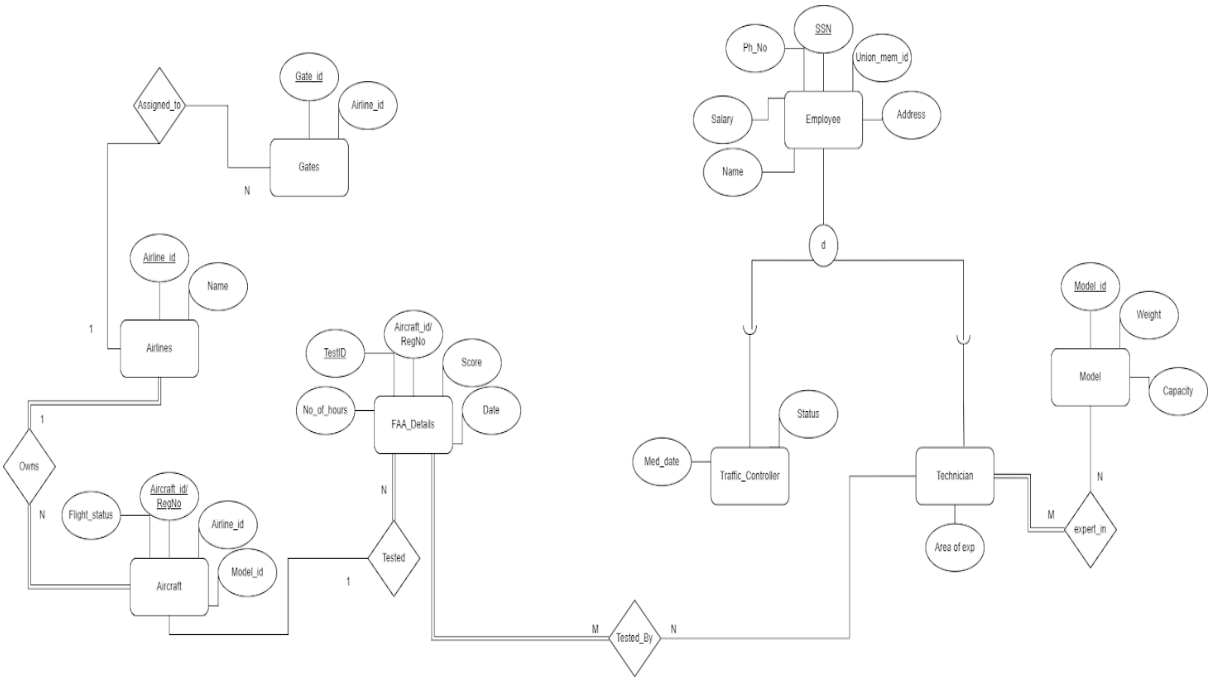
4.4 Non-Functional Requirements

The non-functional requirements define the basic standards that the system maintains to reach the market needs. Also known as the system qualities, they draw constraints and restrictions for the system attributes. The functional requirements will help to maintain performance, usability, scalability, and other aspects that ensure the effectiveness of the entire system. In any project, the non-functional requirements are as critical as the functional requirements, and not being able to attain any of these requirements might result in a system that fails to satisfy its customers.

1. The system will have a promising User Interface which will be easy to use.
2. The system will ensure to be error free.
3. The system will be scalable.
4. The system will have appreciable maintenance by segregating only the active users.
5. The system will keep its data secured and ensure access control.

5. CONCEPTUAL DESIGN OF THE DATABASE

5. 1 ER Diagram



Assumptions:

1. There may be other employees apart from technicians and traffic controllers.
2. A predefined number of gates are leased by the airlines from the airport.
3. Different models have specific weights and capacities.
4. A test can be conducted by multiple technicians depending on their expertise

5.2 List of Business Rules and Integrity Constraints

5.2.1 Business Rules:

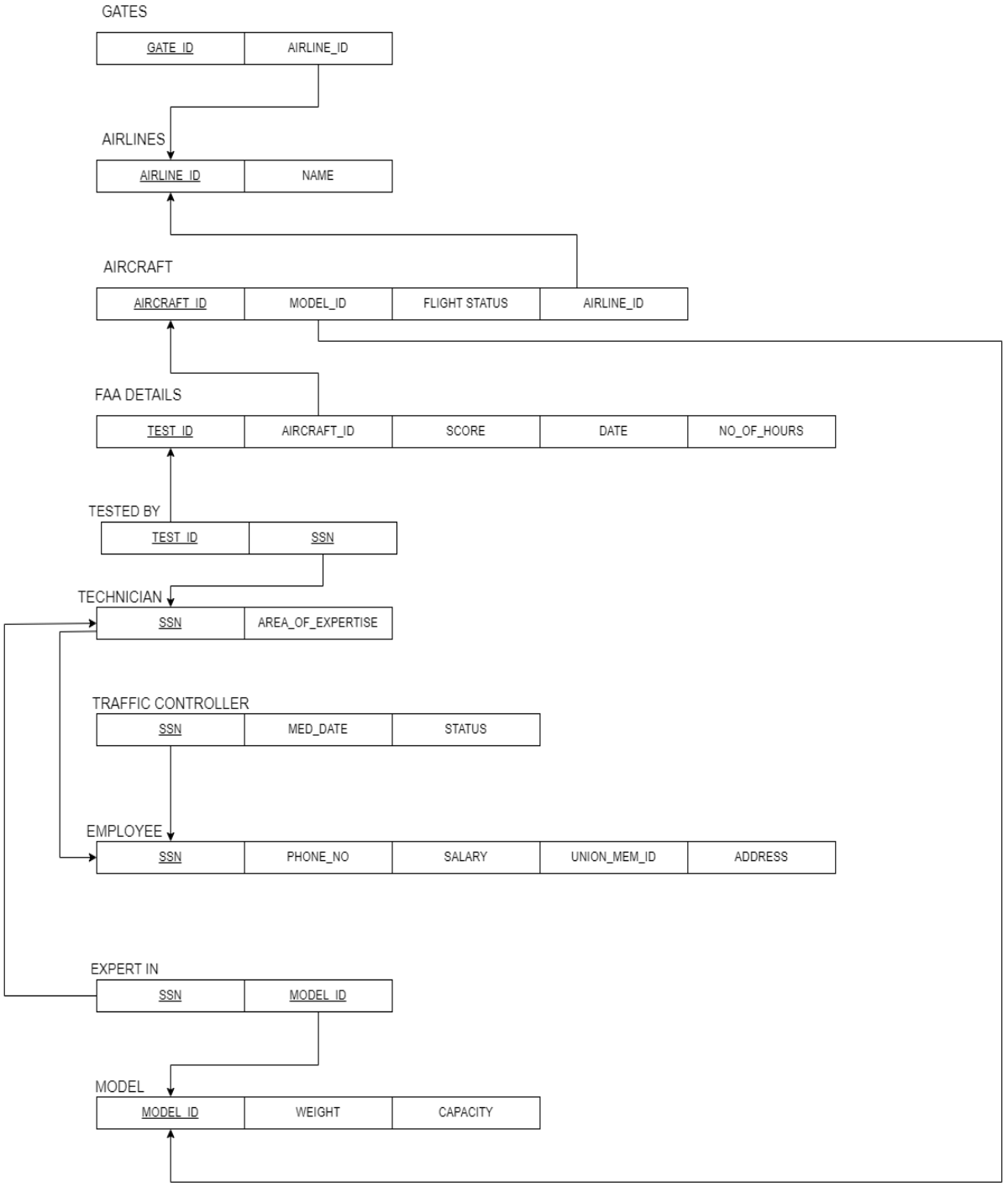
1. Every new Employee should be a part of the Union and be assigned a Membership ID.
2. The FAA Test Score of an Aircraft must fall in the range [0-100].
3. No airline can be assigned more than 10 gates by the Airport Authority.
4. Traffic controllers enter an inactive state if they haven't had a medical examination in the past 365 days.

5.2.2 Integrity Constraints:

	OnUpdate	**OnDelete**
Gates - Airline Id	Cascade	Set Null
Airlines- Airline Id	Cascade	Set Default
Aircraft- Model Id	Restrict	Restrict
FAA_Details- Aircraft Id	Cascade	Set Null
Tested By- Ssn	Cascade	Set Default
Tested By- TestId	Cascade	Restrict
Technician- Ssn	Cascade	Cascade
Traffic Controller-Ssn	Cascade	Cascade
Expert In- Ssn	Cascade	Set Default
Expert In- Model Id	Cascade	Cascade

6. LOGICAL DATABASE SCHEMA

6.1 Relational Database Schema



6.2. SQL Statements and Database Construction

I. Database creation

```
create database airport_system;
use airport_system;
```

II. Table creation

```
create table Airlines(airline_id int default 1111, name varchar(20), primary key (airline_id));

create table Gates(gate_id int, airline_id int, primary key (gate_id), foreign key(airline_id) references Airlines(airline_id) on update cascade on delete set null);

create table Model ( model_id int, weight int, capacity int, primary key(model_id));

create table employee ( ssn int(9) default 999999999, salary decimal(12), union_mem_id int, primary key(ssn));

create table Address( ssn int(9), address_line1 varchar(20), address_line2 varchar(20), city
varchar(20), state varchar(20), pincode varchar(7), primary key(ssn, address_line1), foreign key(ssn) references Employee(ssn) on update cascade on delete cascade );

create table Phone_Number ( ssn  int(9), ph_no int(11), primary key(ssn, ph_no), foreign key ( ssn) references employee(ssn) on update cascade on delete cascade);

create table Aircraft( aircraft_id int, model_id int , flight_status varchar(10), airline_id int, primary key(aircraft_id),
 foreign key (model_id) references Model(model_id) on update restrict on delete restrict, foreign key (airline_id) references Airlines(airline_id) on update cascade on delete set null);

create table Traffic_controller(ssn int(9), med_date date, status varchar(20), primary key(ssn), foreign key (ssn) references Employee(ssn) on update cascade on delete cascade);

create table Technician ( ssn int(9), area_of_expertise varchar(20), primary key (ssn), foreign key ( ssn) references Employee(ssn) on update cascade on delete cascade);

create table FAA_Details( test_id int, aircraft_id int, score decimal(3), date date, no_of_hours int , primary key(test_id), foreign key (aircraft_id) references Aircraft(aircraft_id)
on update cascade on delete set null);

create table Tested_by ( test_id int, ssn int(9), primary key(test_id, ssn), foreign key(test_id) references FAA_Details(test_id) on update cascade on delete restrict, foreign key (ssn)
references Technician(ssn) on update cascade on delete cascade);
```

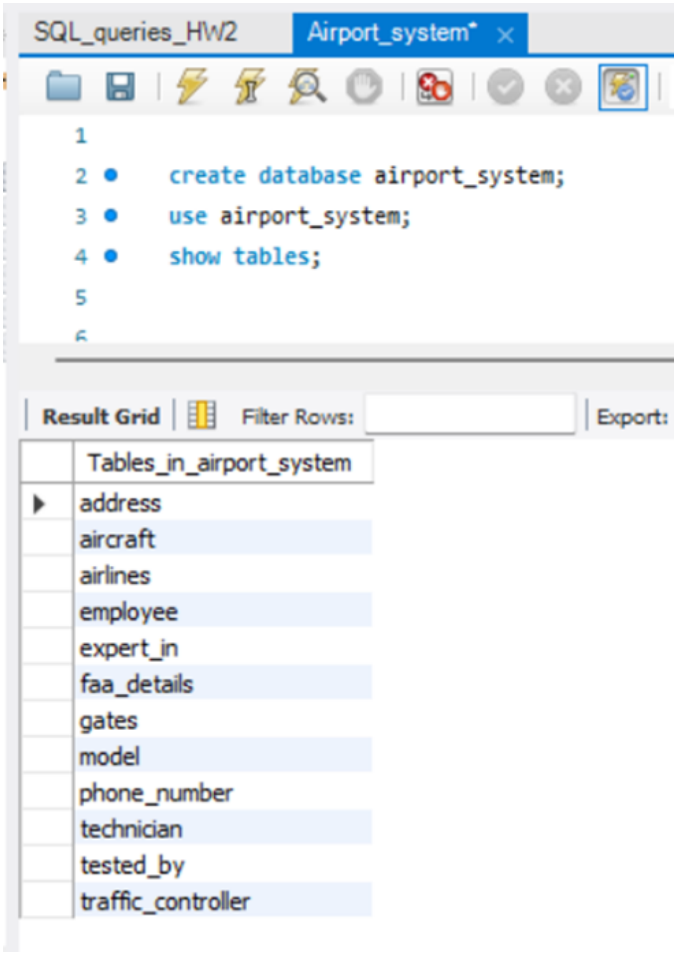
```
create table expert_in(ssn int(9), model_id int, primary key(ssn, model_id), foreign key(ssn) references Technician(ssn) on update cascade , foreign key(model_id) references Model(model_id)
 on update cascade on delete cascade);
```

III. Output:

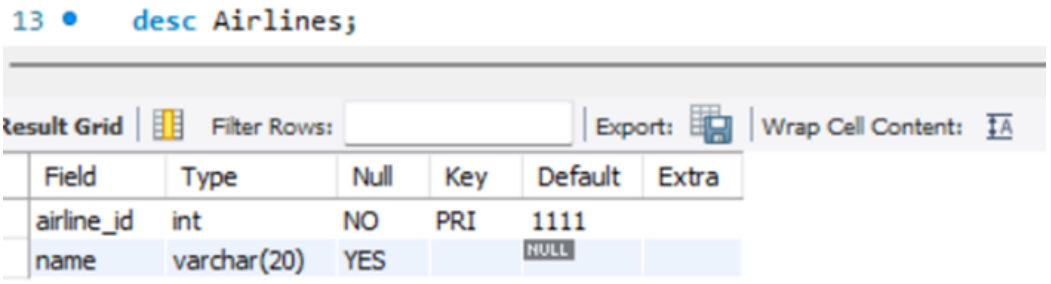
Action Output

#	Time	Action	Message	Duration / Fetch
174	00:07:26	create table Airlines(airline_id int default 1111, name varchar(20), primary key (airline_id))	0 row(s) affected	0.063 sec
175	00:07:38	create table Gates(gate_id int, airline_id int, primary key (gate_id), foreign key(airline_id) references Airlines(airlin...	0 row(s) affected	0.047 sec
176	00:07:40	create table Model (model_id int, weight int, capacity int, primary key(model_id))	0 row(s) affected	0.031 sec
177	00:07:42	create table employee (ssn int(9) default 999999999, salary decimal(12), union_mem_id int, primary key(ssn))	0 row(s) affected, 1 warning(s): 1681 Integer display width is deprecated and will be removed in a future release.	0.031 sec
178	00:07:45	create table Address(ssn int(9), address_line1 varchar(20), address_line2 varchar(20), city varchar(20), state v...	0 row(s) affected, 1 warning(s): 1681 Integer display width is deprecated and will be removed in a future release.	0.032 sec
179	00:07:47	create table Phone_Number (ssn int(9), ph_no int(11), primary key(ssn, ph_no), foreign key (ssn) references e...	0 row(s) affected, 2 warning(s): 1681 Integer display width is deprecated and will be removed in a future release...	0.031 sec
180	00:07:52	create table Aircraft(aircraft_id int, model_id int , flight_status varchar(10), airline_id int, primary key(aircraft_id), ...	0 row(s) affected	0.078 sec
181	00:07:58	create table Traffic_controller(ssn int(9), med_date date, status varchar(20), primary key(ssn), foreign key (ssn) r...	0 row(s) affected, 1 warning(s): 1681 Integer display width is deprecated and will be removed in a future release.	0.031 sec
182	00:08:00	create table Technician (ssn int(9), area_of_expertise varchar(20), primary key (ssn), foreign key (ssn) referenc...	0 row(s) affected, 1 warning(s): 1681 Integer display width is deprecated and will be removed in a future release.	0.031 sec
183	00:08:01	create table FAA_Details(test_id int, aircraft_id int, score decimal(3), date date, no_of_hours int , primary key(te...	0 row(s) affected	0.031 sec
184	00:08:04	create table Tested_by (test_id int, ssn int(9), primary key(test_id, ssn), foreign key(test_id) references FAA_Det...	0 row(s) affected, 1 warning(s): 1681 Integer display width is deprecated and will be removed in a future release.	0.031 sec
185	00:08:05	create table expert_in(ssn int(9), model_id int, primary key(ssn, model_id), foreign key(ssn) references Technicia...	0 row(s) affected, 1 warning(s): 1681 Integer display width is deprecated and will be removed in a future release.	0.032 sec

IV. List of tables created:



V. Table Description:



```
15 •    desc Gates;
16
```

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
gate_id	int	NO	PRI	NULL	
airline_id	int	YES	MUL	NULL	

```
31 •    desc Model;
32
```

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
model_id	int	NO	PRI	NULL	
weight	int	YES		NULL	
capacity	int	YES		NULL	

```
40 •    desc address;
41
```

Result Grid | Filter Rows: | Export: | Wrap Cell

Field	Type	Null	Key	Default	Extra
ssn	int	NO	PRI	NULL	
address_line1	varchar(20)	NO	PRI	NULL	
address_line2	varchar(20)	YES		NULL	
city	varchar(20)	YES		NULL	
state	varchar(20)	YES		NULL	
pincode	varchar(7)	YES		NULL	

```
43 •  desc Phone_Number;
```

Result Grid | Filter Rows: | Export

Field	Type	Null	Key	Default	Extra
ssn	int	NO	PRI	NULL	
ph_no	int	NO	PRI	NULL	

```
50 •  desc Aircraft;
51
```

Result Grid | Filter Rows: | Export: | Wr

Field	Type	Null	Key	Default	Extra
aircraft_id	int	NO	PRI	NULL	
model_id	int	YES	MUL	NULL	
flight_status	varchar(10)	YES		NULL	
airline_id	int	YES	MUL	NULL	

```
55 •  desc Traffic_controller;
56
```

Result Grid | Filter Rows: | Export: | W

Field	Type	Null	Key	Default	Extra
ssn	int	NO	PRI	NULL	
med_date	date	YES		NULL	
status	varchar(20)	YES		NULL	

```
58 •  desc Technician;
59
```

Result Grid | Filter Rows: | Export: | Wrap Cell Co

Field	Type	Null	Key	Default	Extra
ssn	int	NO	PRI	NULL	
area_of_expertise	varchar(20)	YES		NULL	

```
61 •  desc FAA_Details;
62
```

Result Grid | Filter Rows: | Export: | Wra

Field	Type	Null	Key	Default	Extra
test_id	int	NO	PRI	NULL	
aircraft_id	int	YES	MUL	NULL	
score	decimal(3,0)	YES		NULL	
date	date	YES		NULL	
no_of_hours	int	YES		NULL	

```
67 •  desc Tested_by;
68
```

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
test_id	int	NO	PRI	NULL	
ssn	int	NO	PRI	NULL	

```
70 •  desc expert_in;
71
```

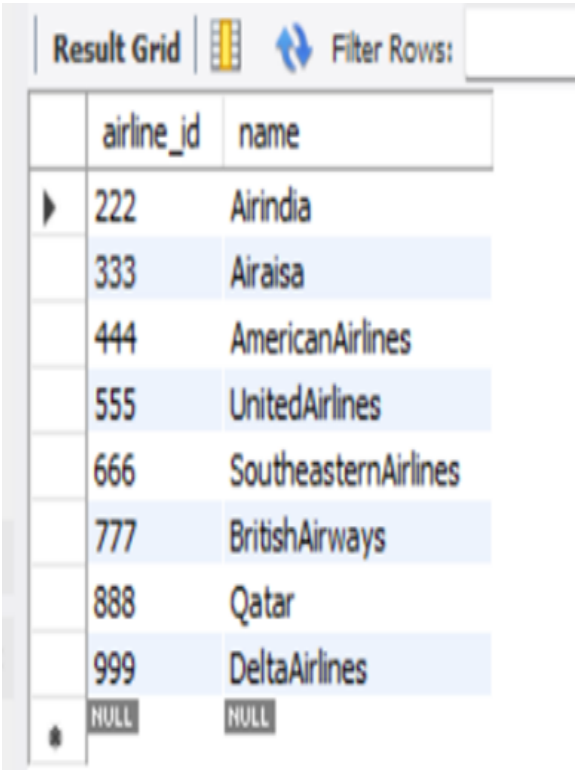
Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
ssn	int	NO	PRI	NULL	
model_id	int	NO	PRI	NULL	

VI. Data Population:

A. Airlines table:

```
insert into airlines(airline_id, name) values(222,"Airindia");
insert into Airlines values(333,"Airaisa");
insert into Airlines values(444,"AmericanAirlines");
insert into Airlines values(555,"UnitedAirlines");
insert into Airlines values(666,"SoutheasternAirlines");
insert into Airlines values(777,"BritishAirways");
insert into Airlines values(888,"Qatar");
insert into Airlines values(999,"DeltaAirlines");
```



airline_id	name
222	Airindia
333	Airaisa
444	AmericanAirlines
555	UnitedAirlines
666	SoutheasternAirlines
777	BritishAirways
888	Qatar
999	DeltaAirlines
NULL	NULL

B. Gates Table:

```
insert into Gates values(1111,222);
insert into Gates values(1112,222);
insert into Gates values(1113,333);
insert into Gates values(1114,333);
insert into Gates values(1115,333);
insert into Gates values(1116,444);
insert into Gates values(1117,444);
insert into Gates values(1118,555);
insert into Gates values(1119,666);
insert into Gates values(1120,777);
insert into Gates values(1121,888);
insert into Gates values(1122,999);
insert into Gates values(1123,999);
```

Result Grid | Filter R

gate_id	airline_id
1111	222
1112	222
1113	333
1114	333
1115	333
1116	444
1117	444
1118	555
1119	666
1120	777
1121	888
1122	999
1123	999
NULL	NULL

C. Model table:

```
insert into Model values(1,20,50);
insert into Model values(2,44,60);
insert into Model values(3,34,70);
insert into Model values(4,34,70);
insert into Model values(5,15,50);
insert into Model values(6,65,60);
insert into Model values(7,34,60);
insert into Model values(8,43,70);
insert into Model values(9,45,40);
insert into Model values(10,45,50);
```

Result Grid | Filter Rows:

model_id	weight	capacity
1	20	50
2	44	60
3	34	70
4	34	70
5	15	50
6	65	60
7	34	60
8	43	70
9	45	40
10	45	50
NULL	NULL	NULL

D. Employee table:

```
insert into employee(ssn,salary, union_mem_id) values(987698761,55000,67671);
insert into employee(ssn,salary, union_mem_id) values(987698762,65000,67672);
insert into employee(ssn,salary, union_mem_id) values(987698763,77000,67673);
insert into employee(ssn,salary, union_mem_id) values(987698764,78000,67674);
insert into employee(ssn,salary, union_mem_id) values(987698765,89000,67675);
insert into employee(ssn,salary, union_mem_id) values(987698766,90000,67676);
insert into employee(ssn,salary, union_mem_id) values(987698767,94000,67677);
insert into employee(ssn,salary, union_mem_id) values(987698768,45000,67678);
insert into employee(ssn,salary, union_mem_id) values(987698769,56000,67679);
insert into employee(ssn,salary, union_mem_id) values(987698770,78000,67680);
insert into employee(ssn,salary, union_mem_id) values(987698771,89000,67681);
```

Result Grid | Filter Rows:

ssn	salary	union_mem_id
987698761	55000	67671
987698762	65000	67672
987698763	77000	67673
987698764	78000	67674
987698765	89000	67675
987698766	90000	67676
987698767	94000	67677
987698768	45000	67678
987698769	56000	67679
987698770	78000	67680
987698771	89000	67681
NULL	NULL	NULL

E. Address Table:

```
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698761,"Frankford Rd","Apt 3434","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698762,"Richarson Rd","Apt 898","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698763,"Frankford Rd","Apt 787","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698764,"Richarson Rd","Apt 444","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698765,"Richarson Rd","Apt 909","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698766,"Madison Rd","Apt 123","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698767,"Madison Rd","Apt 1717","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698768,"Madison Rd","Apt 5656","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698769,"Orchids Rd","Apt 109","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698770,"Melrose Rd","Apt 6767","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698771,"Melrose Rd","Apt 333","Dallas","Texas","75252");
```

Result Grid | Filter Rows: | Edit: | Export

ssn	address_line1	address_line2	city	state	pincode
987698761	Frankford Rd	Apt 3434	Dallas	Texas	75252
987698762	Richarson Rd	Apt 898	Dallas	Texas	75252
987698763	Frankford Rd	Apt 787	Dallas	Texas	75252
987698764	Richarson Rd	Apt 444	Dallas	Texas	75252
987698765	Richarson Rd	Apt 909	Dallas	Texas	75252
987698766	Madison Rd	Apt 123	Dallas	Texas	75252
987698767	Madison Rd	Apt 1717	Dallas	Texas	75252
987698768	Madison Rd	Apt 5656	Dallas	Texas	75252
987698769	Orchids Rd	Apt 109	Dallas	Texas	75252
987698770	Melrose Rd	Apt 6767	Dallas	Texas	75252
987698771	Melrose Rd	Apt 333	Dallas	Texas	75252
NULL	NULL	NULL	NULL	NULL	NULL

F. Phone_number table:

```
insert into phone_number (ssn, ph_no) values(987698761,567567898);
insert into phone_number (ssn, ph_no) values(987698761,567567891);
insert into phone_number (ssn, ph_no) values(987698762,675675788);
insert into phone_number (ssn, ph_no) values(987698763,564678898);
insert into phone_number (ssn, ph_no) values(987698764,987987678);
insert into phone_number (ssn, ph_no) values(987698765,234234543);
insert into phone_number (ssn, ph_no) values(987698766,678678564);
insert into phone_number (ssn, ph_no) values(987698767,890897567);
insert into phone_number (ssn, ph_no) values(987698768,890109272);
insert into phone_number (ssn, ph_no) values(987698769,679091234);
insert into phone_number (ssn, ph_no) values(987698770,786756478);
insert into phone_number (ssn, ph_no) values(987698771,897890121);
insert into phone_number (ssn, ph_no) values(987698771,897098348);
insert into phone_number (ssn, ph_no) values(987698771,345543679);
```

Result Grid | Filter Rows:

ssn	ph_no
987698761	567567891
987698761	567567898
987698762	675675788
987698763	564678898
987698764	987987678
987698765	234234543
987698766	678678564
987698767	890897567
987698768	890109272
987698769	679091234
987698770	786756478
987698771	345543679
987698771	897098348
987698771	897890121
NULL	NULL

G. Aircraft table:

```
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(2228883,1,"inAir",222);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(2228884,2,"landed",222);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(222888,3,"undertest",222);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(3338882,1,"inAir",333);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(3338883,4,"inAir",333);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(2228881,5,"inAir",222);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(2228882,6,"landed",222);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(3338881,7,"landed",333);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(4448881,8,"landed",444);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(5558881,9,"landed",555);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(6668881,1,"inAir",666);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(7778881,2,"landed",777);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(8888881,3,"inAir",888);
insert into aircraft(aircraft_id, model_id,flight_status,airline_id) values(9998881,4,"landed",999);
```

Result Grid | Filter Rows: | Ed

aircraft_id	model_id	flight_status	airline_id
222888	3	undertest	222
2228881	5	inAir	222
2228882	6	landed	222
2228883	1	inAir	222
2228884	2	landed	222
3338881	7	landed	333
3338882	1	inAir	333
3338883	4	inAir	333
4448881	8	landed	444
5558881	9	landed	555
6668881	1	inAir	666
7778881	2	landed	777
8888881	3	inAir	888
9998881	4	landed	999
NULL	NULL	NULL	NULL

H. Traffic_controller table:

```
insert into traffic_controller (ssn, med_date, status) values (987698761,11/2/2021,"Done");
insert into traffic_controller (ssn, med_date, status) values (987698762,1/2/2022,"Done");
insert into traffic_controller (ssn, med_date, status) values (987698763,3/2/2022,"Done");
```

Result Grid | Filter Rows:

ssn	med_date	status
987698761	0000-00-00	Done
987698762	0000-00-00	Done
987698763	0000-00-00	Done
NULL	NULL	NULL

I. Technician table:

```
insert into Technician (ssn, area_of_expertise) values (987698764, "hydraulics");
insert into Technician (ssn, area_of_expertise) values (987698765, "engine");
insert into Technician (ssn, area_of_expertise) values (987698766, "propeller");
insert into Technician (ssn, area_of_expertise) values (987698767, "wings");
insert into Technician (ssn, area_of_expertise) values (987698768, "engine");
insert into Technician (ssn, area_of_expertise) values (987698769, "hydraulics");
```

Result Grid | Filter Rows:

ssn	area_of_expertise
987698764	hydraulics
987698765	engine
987698766	propeller
987698767	wings
987698768	engine
987698769	hydraulics
NULL	NULL

J. FAA_details table:

```
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7771,2228884,78,1/2/2021,9);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7772,2228884,78,10/1/2022,8);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7773,2228884,78,9/4/2019,8);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7774,2228883,78,7/3/2021,6);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7775,2228883,78,1/5/2020,7);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7776,2228883,78,1/7/2022,8);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7777,2228883,56,8/8/2019,9);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7778,2228883,88,8/9/2018,12);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7779,2228882,98,7/8/2022,6);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7780,2228881,78,6/7/2022,8);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7781,2228881,89,3/4/2021,9);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7782,2228882,87,1/2/2021,9);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7783,3338881,82,6/1/2022,8);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7784,4448881,34,5/3/2021,7);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7785,4448881,12,4/2/2022,12);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7786,5558881,78,3/5/2022,12);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7787,6668881,89,8/6/2022,11);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7788,7778881,89,7/7/2022,10);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7789,8888881,99,6/8/2022,6);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7790,9998881,90,5/9/2022,5);
insert into FAA_Details (test_id,aircraft_id,score,date,no_of_hours) values (7791,9998881,89,4/9/2021,4);
```

Result Grid | Filter Rows: | Edit:

test_id	aircraft_id	score	date	no_of_hours
7771	2228884	78	0000-00-00	9
7772	2228884	78	0000-00-00	8
7773	2228884	78	0000-00-00	8
7774	2228883	78	0000-00-00	6
7775	2228883	78	0000-00-00	7
7776	2228883	78	0000-00-00	8
7777	2228883	56	0000-00-00	9
7778	2228883	88	0000-00-00	12
7779	2228882	98	0000-00-00	6
7780	2228881	78	0000-00-00	8
7781	2228881	89	0000-00-00	9
7782	2228882	87	0000-00-00	9
7783	3338881	82	0000-00-00	8
7784	4448881	34	0000-00-00	7
7785	4448881	12	0000-00-00	12
7786	5558881	78	0000-00-00	12
7787	6668881	89	0000-00-00	11
7788	7778881	89	0000-00-00	10
7789	8888881	99	0000-00-00	6
7790	9998881	90	0000-00-00	5
7791	9998881	89	0000-00-00	4
NULL	NULL	NULL	NULL	NULL

K. Tested_by table:

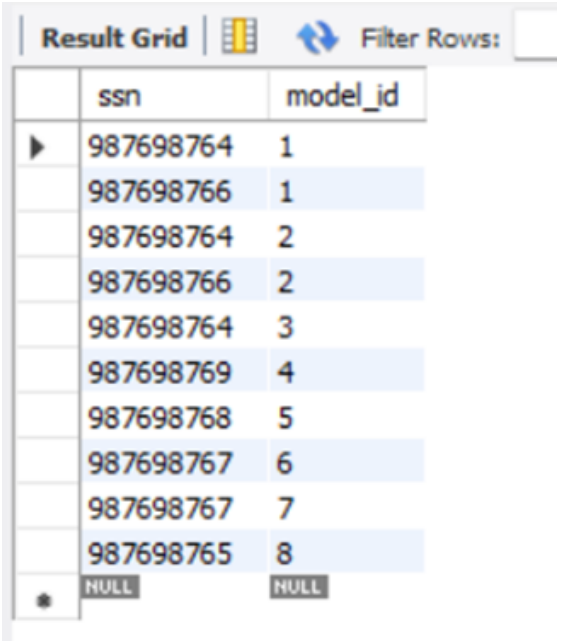
```
insert into tested_by(test_id,ssn) values(7771,987698764);
insert into tested_by(test_id,ssn) values(7772,987698765);
insert into tested_by(test_id,ssn) values(7773,987698766);
insert into tested_by(test_id,ssn) values(7774,987698767);
insert into tested_by(test_id,ssn) values(7775,987698768);
insert into tested_by(test_id,ssn) values(7776,987698769);
insert into tested_by(test_id,ssn) values(7777,987698764);
insert into tested_by(test_id,ssn) values(7778,987698765);
insert into tested_by(test_id,ssn) values(7779,987698766);
insert into tested_by(test_id,ssn) values(7780,987698766);
insert into tested_by(test_id,ssn) values(7781,987698767);
insert into tested_by(test_id,ssn) values(7782,987698767);
insert into tested_by(test_id,ssn) values(7783,987698764);
insert into tested_by(test_id,ssn) values(7784,987698764);
insert into tested_by(test_id,ssn) values(7785,987698765);
insert into tested_by(test_id,ssn) values(7786,987698765);
insert into tested_by(test_id,ssn) values(7787,987698766);
insert into tested_by(test_id,ssn) values(7788,987698766);
insert into tested_by(test_id,ssn) values(7789,987698767);
insert into tested_by(test_id,ssn) values(7790,987698768);
insert into tested_by(test_id,ssn) values(7791,987698769);
```

Result Grid | Filter

test_id	ssn
7771	987698764
7777	987698764
7783	987698764
7784	987698764
7772	987698765
7778	987698765
7785	987698765
7786	987698765
7773	987698766
7779	987698766
7780	987698766
7787	987698766
7788	987698766
7774	987698767
7781	987698767
7782	987698767
7789	987698767
7775	987698768
7790	987698768
7776	987698769
7791	987698769
NULL	NULL

L. Expert_in table:

```
insert into expert_in (ssn,model_id) values (987698764,1);
insert into expert_in (ssn,model_id) values (987698764,2);
insert into expert_in (ssn,model_id) values (987698764,3);
insert into expert_in (ssn,model_id) values (987698765,8);
insert into expert_in (ssn,model_id) values (987698766,1);
insert into expert_in (ssn,model_id) values (987698766,2);
insert into expert_in (ssn,model_id) values (987698767,7);
insert into expert_in (ssn,model_id) values (987698767,6);
insert into expert_in (ssn,model_id) values (987698768,5);
insert into expert_in (ssn,model_id) values (987698769,4);
```



ssn	model_id
987698764	1
987698766	1
987698764	2
987698766	2
987698764	3
987698769	4
987698768	5
987698767	6
987698767	7
987698765	8
NULL	NULL

6.3 Expected Database Operations

6.3.1 Queries:

a. **Select all the aircraft details**

```
354      -- Tc view all aircrafts details
355 •    select * from aircraft;
356
357
```

Result Grid | Filter Rows: | Edit:

aircraft_id	model_id	flight_status	airline_id
222888	3	undertest	222
2228881	5	inAir	222
2228882	6	landed	222
2228883	1	inAir	222
2228884	2	landed	222
3338881	7	landed	333
3338882	1	inAir	333
3338883	4	inAir	333
4448881	8	landed	444
5558881	9	landed	555
6668881	1	inAir	666
7778881	2	landed	777
8888881	3	inAir	888
9998881	4	landed	999
NULL	NULL	NULL	NULL

b. **Select the details of the specific aircraft detail**

```
359      -- TC view specific aircraft detail by giving aircraft id
360 •    select * from Aircraft where aircraft_id = "2228884";
```

Result Grid | Filter Rows: | Edit: | Export/I

aircraft_id	model_id	flight_status	airline_id
2228884	2	landed	222
NULL	NULL	NULL	NULL

c. Update the specific aircraft's flight_status.

```
367     -- TC update the aircraft status by giving specific aircraft id
368 •   update aircraft set flight_status = "undertest" where aircraft_id = "2228884";
```

```
761  14:49:55  update aircraft set flight_status = "undertest" where aircraft_id = "2228884"   1 row(s) affected Rows matched: 1  Changed: 1  Warnings: 0   0.032 sec
```

```
360 •   select * from Aircraft where aircraft_id = "2228884";
```

Result Grid | Filter Rows: | Edit: | Export/Import: | Wrap Cell Content:

aircraft_id	model_id	flight_status	airline_id
2228884	2	undertest	222
NULL	NULL	NULL	NULL

d. SQL Query to check if the gates are assigned to the particular airline id

```
1     -- SQL Query to check if the gates are assigned to the particular airline id
2
3 •   SELECT gate_id
4     FROM Airlines, Gates
5     WHERE Airlines.airline_id = Gates.airline_id;
```

100% 77:1

Result Grid | Filter Rows: Search | Export:

gate_id
1111
1112
1113
1114
1115
1116
1117
1118
1119
1120
1121
1122
1123

e. Updating the aircraft details after the flight is landed

```
•   UPDATE Aircraft
    set flight_status = 'landed'
    where aircraft_id ='3338881';
```

Result Grid | Filter Rows: Search | Edit: | Export/Import:

aircraft_id	model_id	flight_status	airline_id
222888	3	undertest	222
2228881	5	inAir	222
2228882	6	landed	222
2228883	1	inAir	222
2228884	2	landed	222
3338881	7	landed	333
3338882	1	inAir	333
3338883	4	inAir	333
4448881	8	landed	444
5558881	9	landed	555
6668881	1	inAir	666
7778881	2	landed	777
8888881	3	inAir	888
9998881	4	landed	999
NULL	NULL	NULL	NULL

6.3.2 TECHNICIAN:

a. Updating expertise

```
390 •  select * from expert_in where ssn = 987698769;
391 •  Update expert_in
392    Set ssn =  987698769, model_id = 6
393    Where ssn = 987698769;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

ssn	model_id
987698769	4

expert_in 14 | Read Only

Output

Action Output

#	Time	Action	Message	Duration / Fetch
35	19:03:28	Select * from FAA_Details as f where myTechid in any (select distinct ssn from tested_by where test_id=f.test_id)	Error Code: 1064. You have an error in your SQL syntax; check the manual that corresponds to your MySQL se...	0.000 sec
36	19:10:11	select * from expert_in where ssn = 987698769 LIMIT 0, 1000	1 row(s) returned	0.015 sec / 0.000 sec

```
390 •  select * from expert_in where ssn = 987698769;
391 •  Update expert_in
392    Set ssn =  987698769, model_id = 6
393    Where ssn = 987698769;
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

ssn	model_id
987698769	6

expert_in 15 | Read Only

Output

Action Output

#	Time	Action	Message	Duration / Fetch
37	19:10:25	Update expert_in Set ssn = 987698769, model_id = 6 Where ssn = 987698769	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0	0.016 sec
38	19:10:29	select * from expert_in where ssn = 987698769 LIMIT 0, 1000	1 row(s) returned	0.000 sec / 0.000 sec

b. Update faa_details

```
395 •  select * from faa_details where test_id = 7791;
396 •  Update faa_details
397    Set aircraft_id = 9998881, score = 90 , date =2/2/2022, no_of_hours =7
398    Where test_id = 7791;
399
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

test_id	aircraft_id	score	date	no_of_hours
7791	9998881	89	0000-00-00	4

faa_details 16 × Read Only

Output

Action Output

#	Time	Action	Message	Duration / Fetch
38	19:10:29	select * from expert_in where ssn = 987698769 LIMIT 0, 1000	1 row(s) returned	0.000 sec / 0.000 sec
39	19:14:45	select * from faa_details where test_id = 7791 LIMIT 0, 1000	1 row(s) returned	0.000 sec / 0.000 sec

```
395 •  select * from faa_details where test_id = 7791;
396 •  Update faa_details
397    Set aircraft_id = 9998881, score = 90 , date =2/2/2022, no_of_hours =7
398    Where test_id = 7791;
399
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

test_id	aircraft_id	score	date	no_of_hours
7791	9998881	90	0000-00-00	7

'aa_details 17 × Read Onl

Output

Action Output

#	Time	Action	Message	Duration / Fetch
40	19:15:36	Update faa_details Set aircraft_id = 9998881, score = 90 , date =2/2/2022, no_of_hours =7 Where test_id = 7...	1 row(s) affected Rows matched: 1 Changed: 1 Warnings: 0	0.000 sec
41	19:15:39	select * from faa_details where test_id = 7791 LIMIT 0, 1000	1 row(s) returned	0.016 sec / 0.000 sec

c. Fetch the faa_test details of the test done by specific technician

```
404 •  Select *
405    from FAA_Details as f
406    where f.test_id in(select distinct test_id from tested_by where ssn = 987698769 );
```

Result Grid | Filter Rows: | Export: | Wrap Cell Content:

test_id	aircraft_id	score	date	no_of_hours
7776	2228883	78	0000-00-00	8
7791	9998881	90	0000-00-00	7

FAA_Details 37 × Read On

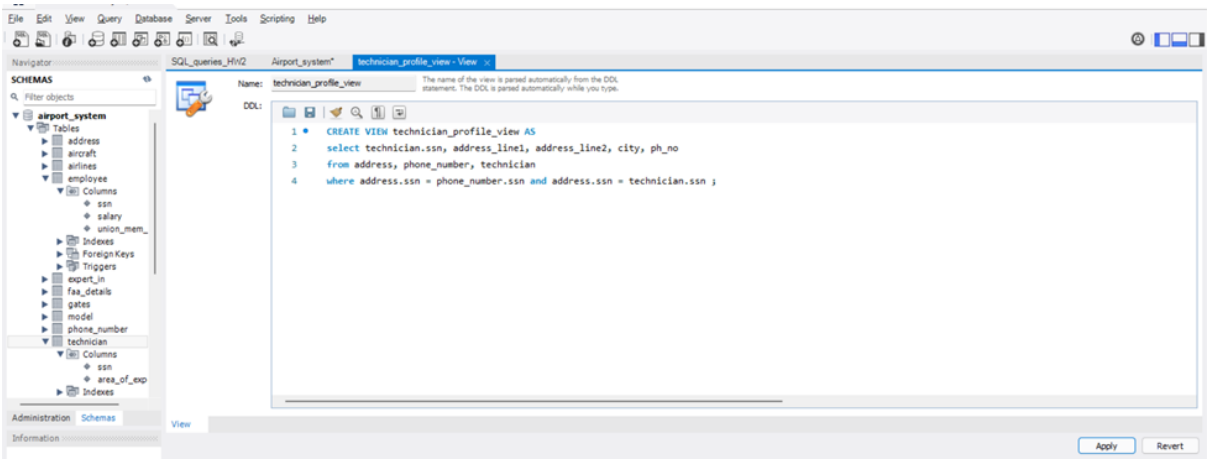
Output

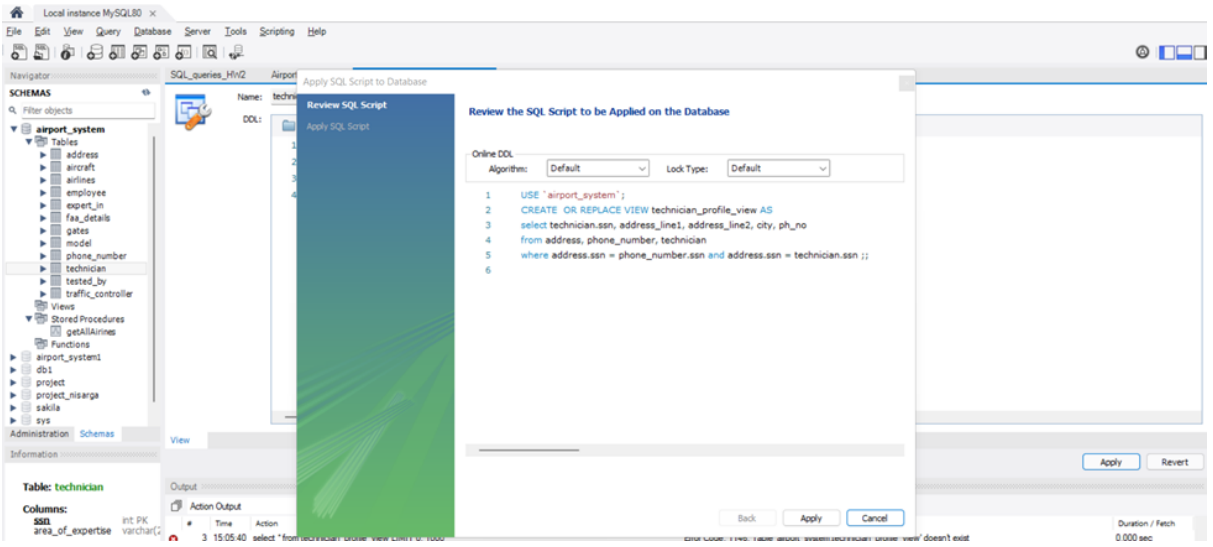
Action Output

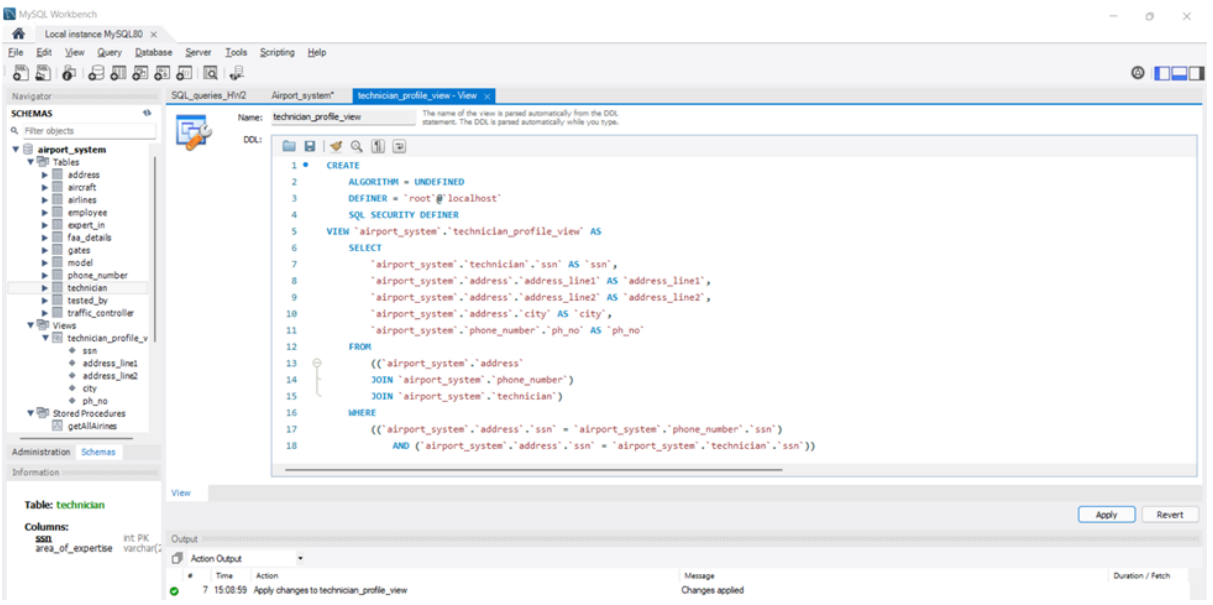
#	Time	Action	Message	Duration / Fetch
64	19:23:49	select * from tested_by where ssn = 987698769 LIMIT 0, 1000	2 row(s) returned	0.000 sec / 0.000 sec
65	19:23:52	Select * from FAA_Details as f where f.test_id in(select distinct test_id from tested_by where ssn = 987698769) ...	2 row(s) returned	0.000 sec / 0.000 sec

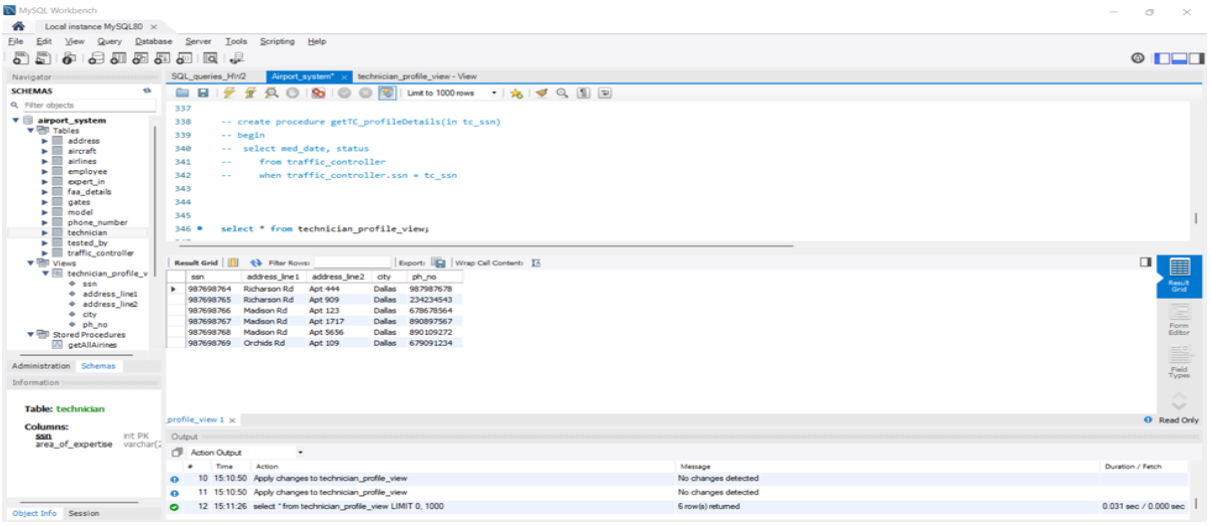
6.4 Views

a. View to get all technician profile details

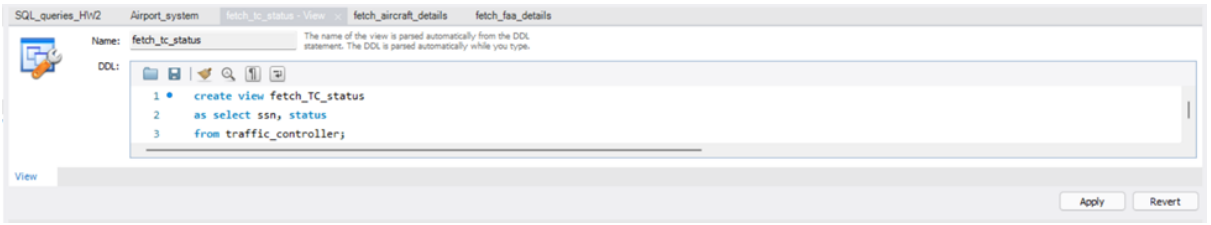




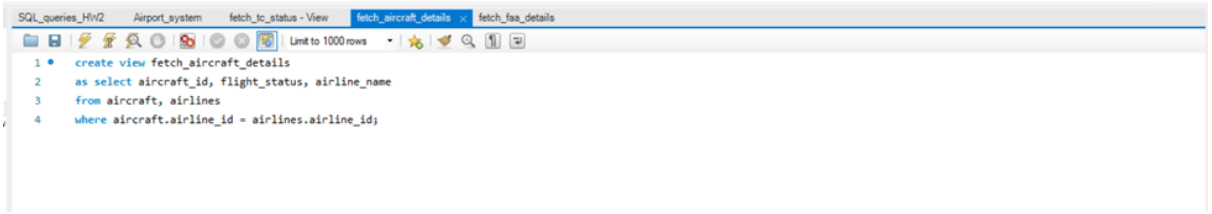




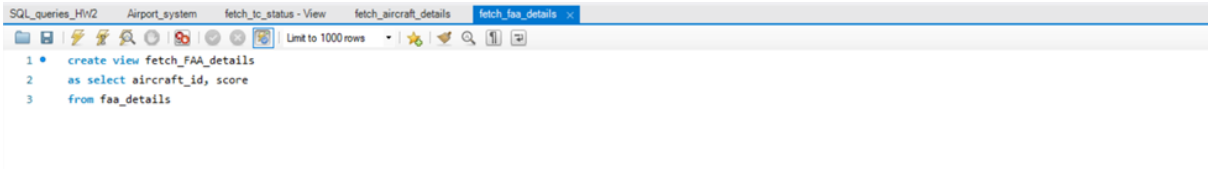
b. View to get traffic controller status detail



c. View to get the aircraft details



d. View to get the FAA_test details



e. View to get the list of landed flights

```
10 •  CREATE VIEW Landed_aircraft AS
11    SELECT *
12    FROM Aircraft
13    WHERE flight_status = 'landed';
14
15 •  SELECT *
16    FROM Landed_aircraft;
17
```

100% 9:15

Result Grid Filter Rows: Search Export:

aircraft_id	model_id	flight_status	airline_id
2228882	6	landed	222
2228884	2	landed	222
3338881	7	landed	333
4448881	8	landed	444
5558881	9	landed	555
7778881	2	landed	777
9998881	4	landed	999

7. FUNCTIONAL DEPENDENCIES AND DATABASE NORMALIZATION

7.1 Identifying Functional dependencies

There are no Functional dependencies observed in the relations of the schema since all of the non-primary key columns are completely functionally dependent upon the primary key itself.

7.2 Normalizing the Relations in the Schema

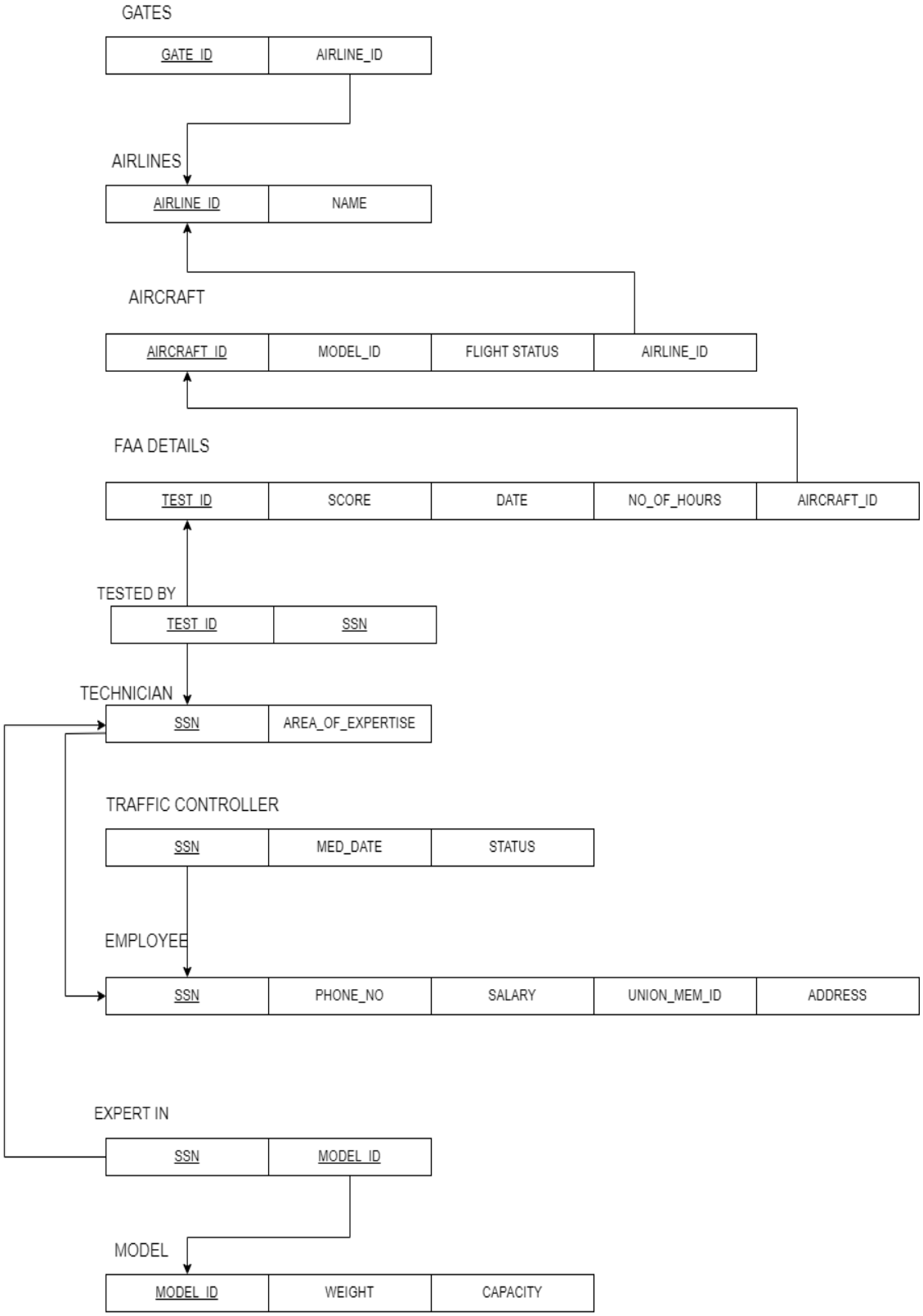
It is observed that every relation in the schema is in the Third Normal Form(3NF) except the EMPLOYEE table which consists of two attributes violating 1NF:

1. PHONE_NO —> Multivalued Attribute
2. ADDRESS —> Composite Attribute

Therefore the EMPLOYEE table is Decomposed into EMPLOYEE, PHONE_NUMBER and ADDRESS Tables.

And upon further Inspection every relation in the schema is observed to be in their Third Normal Form(3NF).

7.2.1 Schema before Normalization



7.2.2 Schema of all the relations in their Third Normal Form(3NF)

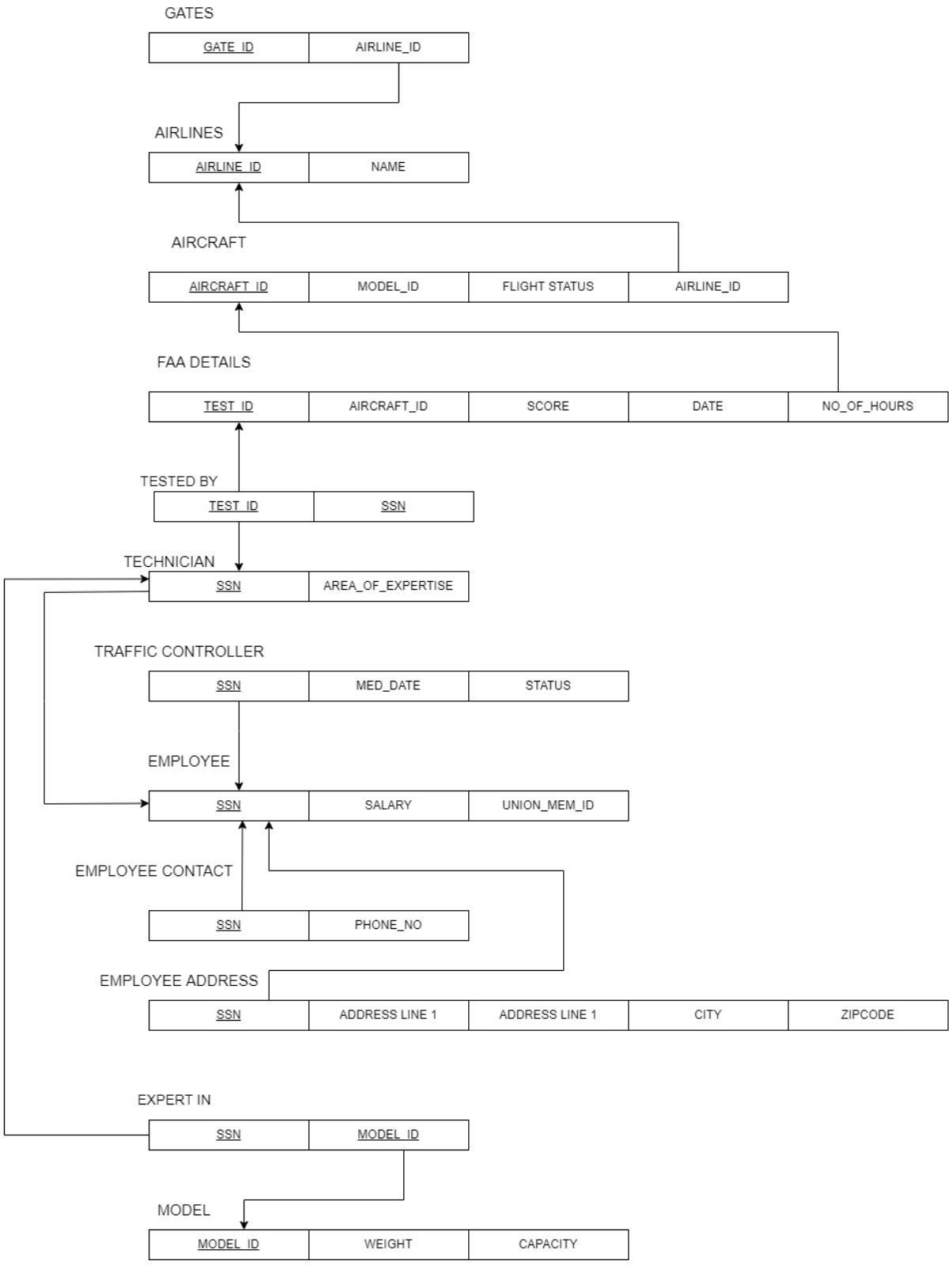


Fig : Functional Dependencies of the Normalized Relations of the DB System

7.3 SQL Statements for Constructing Normalized Table

7.3.1 Creating the Normalized Table ADDRESS and PHONE_NUMBER

```
create table Address( ssn int(9), address_line1 varchar(20), address_line2 varchar(20), city
varchar(20), state varchar(20), pincode varchar(7), primary key(ssn, address_line1),
foreign key(ssn) references Employee(ssn) on update cascade on delete cascade );
desc Address;
```

Field	Type	Null	Key	Default	Extra
ssn	int	NO	PRI	NULL	
address_line1	varchar(20)	NO	PRI	NULL	
address_line2	varchar(20)	YES		NULL	
city	varchar(20)	YES		NULL	
state	varchar(20)	YES		NULL	
pincode	varchar(7)	YES		NULL	

```
create table Phone_Number ( ssn  int(9), ph_no int(11), primary key(ssn, ph_no), foreign key ( ssn)
references employee(ssn) on update cascade on delete cascade);
desc Phone_Number;
```

Field	Type	Null	Key	Default	Extra
ssn	int	NO	PRI	NULL	
ph_no	int	NO	PRI	NULL	

7.3.2 Inserting Values to the Normalised Table ADDRESS and PHONE_NUMBER

```
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698761,"Frankford Rd","Apt 3434","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698762,"Richarson Rd","Apt 898","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698763,"Frankford Rd","Apt 787","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698764,"Richarson Rd","Apt 444","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698765,"Richarson Rd","Apt 909","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698766,"Madison Rd","Apt 123","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698767,"Madison Rd","Apt 1717","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698768,"Madison Rd","Apt 5656","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698769,"Orchids Rd","Apt 109","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698770,"Melrose Rd","Apt 6767","Dallas","Texas","75252");
insert into Address(ssn, address_line1,address_line2,city,state,pincode) values (987698771,"Melrose Rd","Apt 333","Dallas","Texas","75252");
```

```
select * from Address;
```

ssn	address_line1	address_line2	city	state	pincode
987698762	Richarson Rd	Apt 898	Dallas	Texas	75252
987698763	Frankford Rd	Apt 787	Dallas	Texas	75252
987698764	Richarson Rd	Apt 444	Dallas	Texas	75252
987698765	Richarson Rd	Apt 909	Dallas	Texas	75252
987698766	Madison Rd	Apt 123	Dallas	Texas	75252
987698767	Madison Rd	Apt 1717	Dallas	Texas	75252
987698768	Madison Rd	Apt 5656	Dallas	Texas	75252
987698769	Orchids Rd	Apt 109	Dallas	Texas	75252
987698770	Melrose Rd	Apt 6767	Dallas	Texas	75252
987698771	Melrose Rd	Apt 333	Dallas	Texas	75252
NULL	NULL	NULL	NULL	NULL	NULL

```
insert into phone_number (ssn, ph_no) values(987698761,567567898);
insert into phone_number (ssn, ph_no) values(987698761,567567891);
insert into phone_number (ssn, ph_no) values(987698762,675675788);
insert into phone_number (ssn, ph_no) values(987698763,564678898);
insert into phone_number (ssn, ph_no) values(987698764,987987678);
insert into phone_number (ssn, ph_no) values(987698765,234234543);
insert into phone_number (ssn, ph_no) values(987698766,678678564);
insert into phone_number (ssn, ph_no) values(987698767,890897567);
insert into phone_number (ssn, ph_no) values(987698768,890109272);
insert into phone_number (ssn, ph_no) values(987698769,679091234);
insert into phone_number (ssn, ph_no) values(987698770,786756478);
insert into phone_number (ssn, ph_no) values(987698771,897890121);
insert into phone_number (ssn, ph_no) values(987698771,897098348);
insert into phone_number (ssn, ph_no) values(987698771,345543679);
select * from Phone_Number;
```

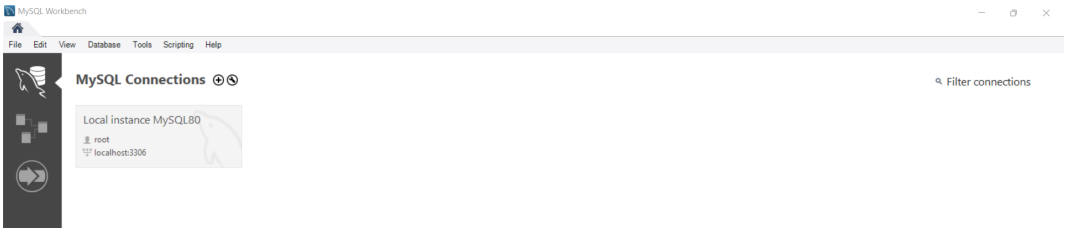
ssn	ph_no
987698762	675675788
987698763	564678898
987698764	987987678
987698765	234234543
987698766	678678564
987698767	890897567
987698768	890109272
987698769	679091234
987698770	786756478
987698771	345543679
987698771	897098348
987698771	897890121
NULL	NULL

8. THE DATABASE SYSTEM

We have used Mysql workbench for mysql database and Eclipse IDE for running the Java Springboot application. Below sections shows the detailed description about how to install and access our application.

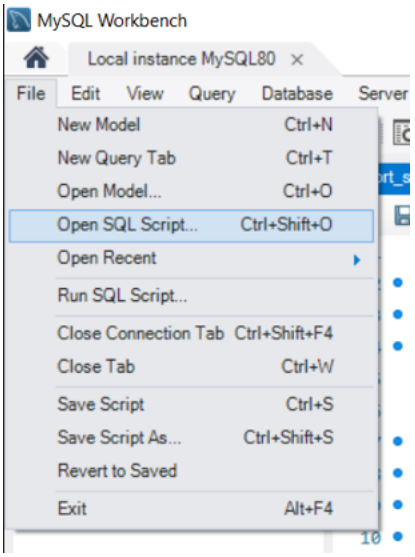
Steps to setup the mysql workbench:

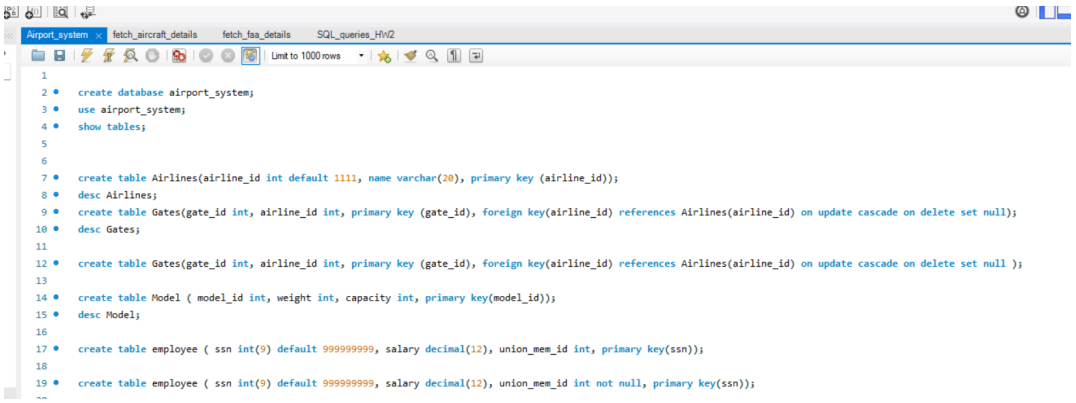
1. Download the latest version of the mysql workbench from the mysl official website and double click the downloaded file and install.
2. Give the credentials for your mysql workbench during installation and save it for later access to the workbench databases.
3. Upon installation, open the mysql application installed.



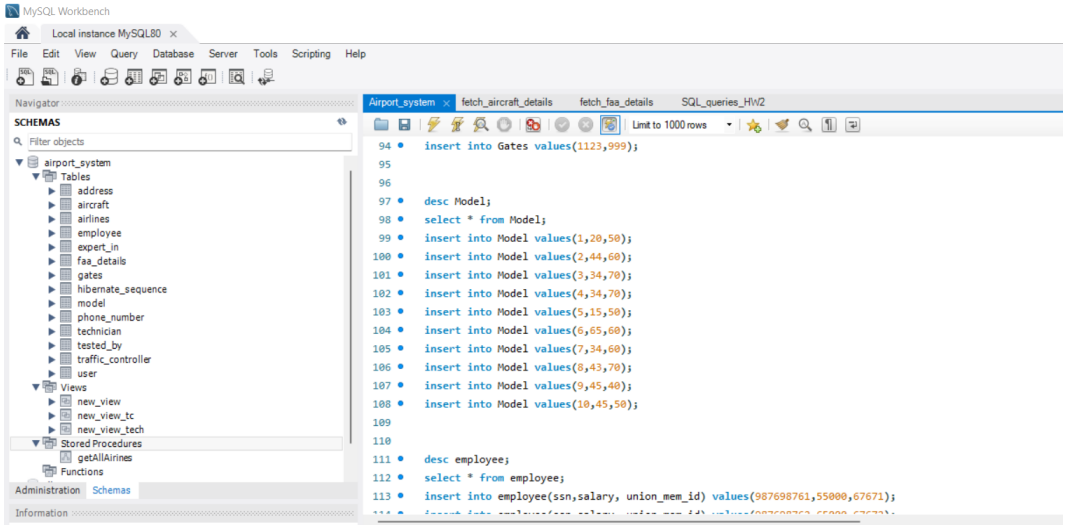
Open script file and run the command to create the database and tables

Use the commands in the .sql file provided in the project folder for all the commands to create the table and populate the data. The sample output is as shown in the section 6 (6.1, 6.2 and 6.3)





On the left side of the mysql workbench we can see the database created and the list of tables and views created as shown in the screenshot below. Now confirm that the mysql server status is running and start the Java application after updating the configurations as per the next steps below.

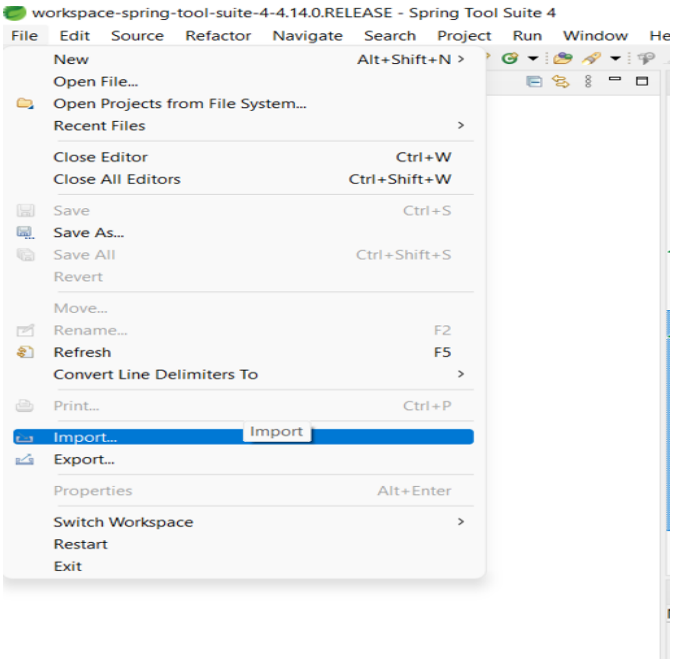


Steps to run the java application:

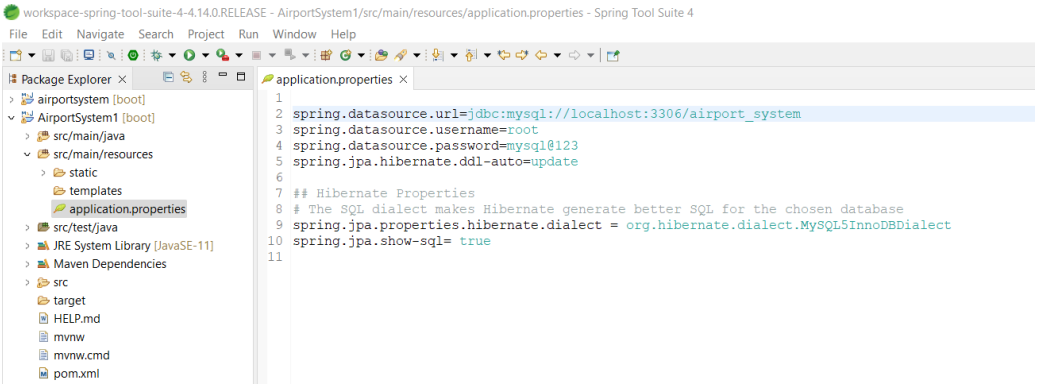
1.Install the Spring tool suite IDE from the official STS website and run the application.

2. Extract the AirportSystem1.zip file from the /project folder.

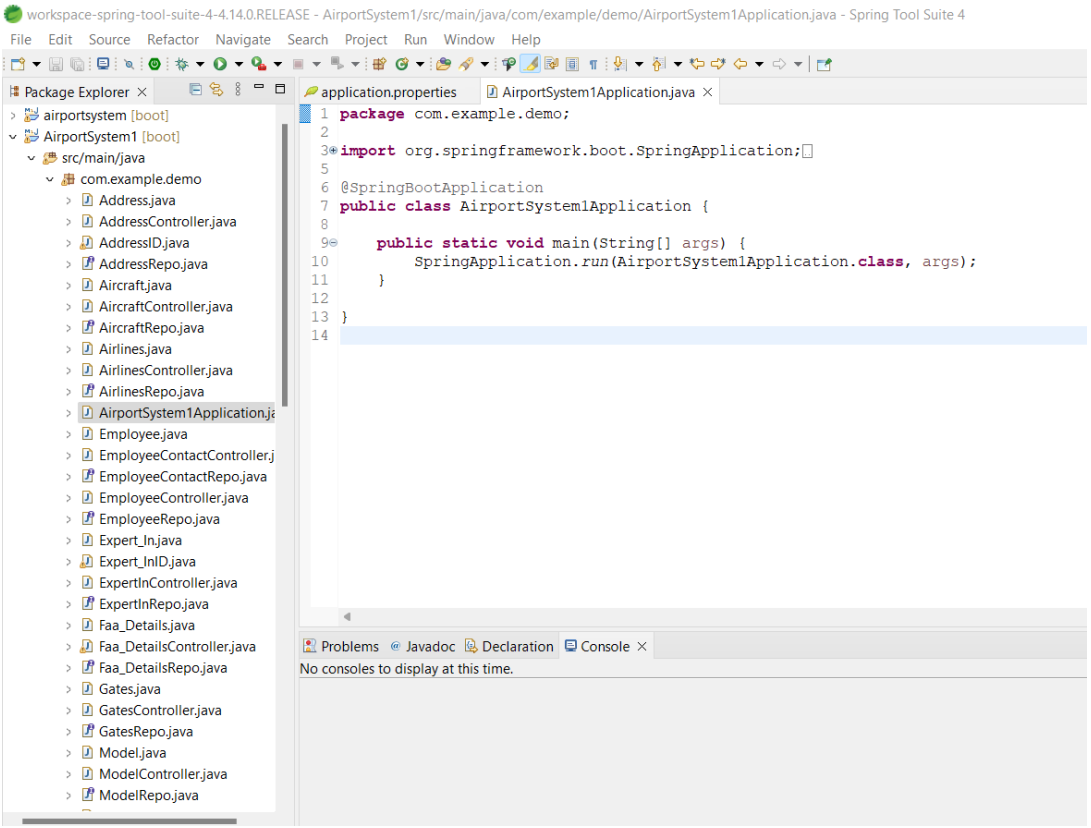
3. In the STS side click on the File > Import and choose the directory of the extracted folder from step 2 and open it.



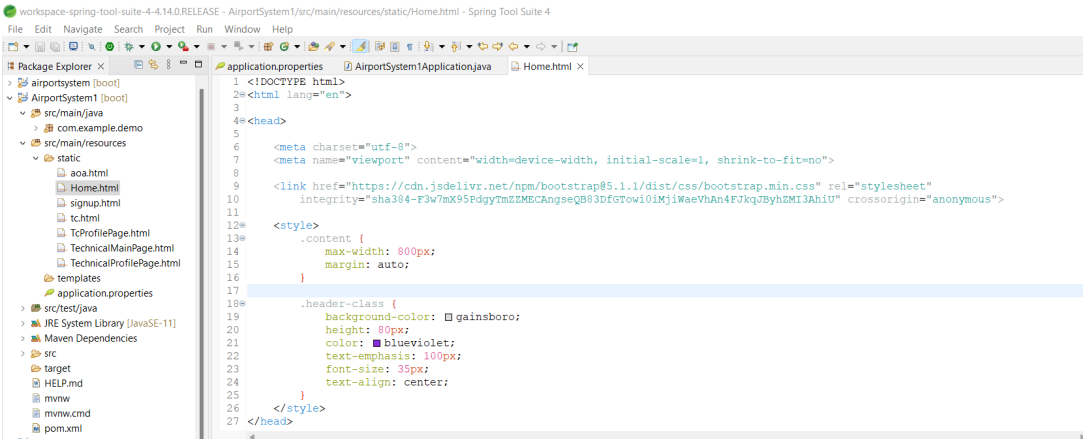
4. Upon opening the folder, in the location src/main/resources, the file named “application.properties" has the property fields that contains the database credentials and database url, where we need to provide the url of the mysql server running, and the credentials which was saved while installing the mysql workbench in previous step. Here, airport_system refers to the database created in mysql. These are the very important details and must be proper to establish the connection with the mysql database.



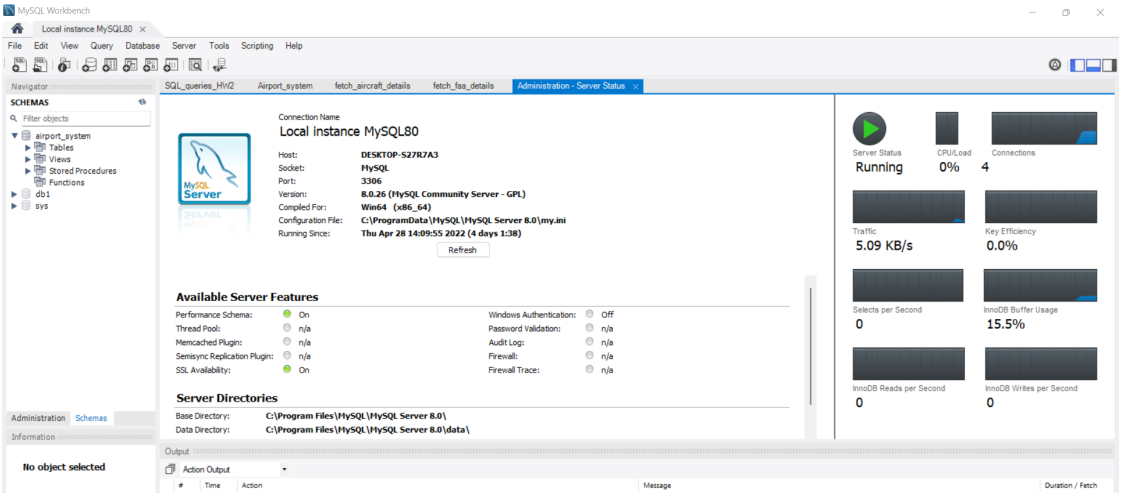
5. src/main/java folder contains the package called “com.example.demo” which contains all the java classes used for implementing the business logic of the application and also the connectivity from database to the frontend. Below screenshot shows the list of java classes of the application.



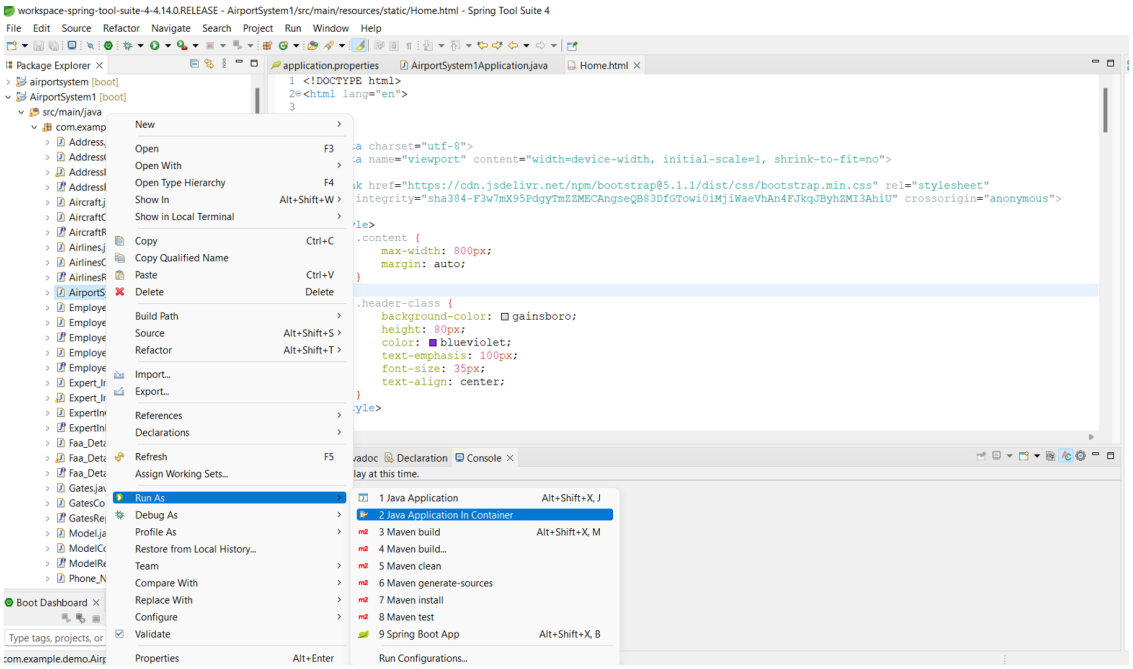
6. src/main/resources contains all the frontend related code in the form of html pages as shown in the screenshot below.



7. Make sure mysql server status is running and the airport system database is created and its table and data is populated as said earlier.



8. Click on the java file named as “AirportSystem1Application.java” under the location “/AirportSystem1/src/main/java/com/example/demo/AirportSystem1Application.java ” and choose to run as “Java Application” as shown below to start the application.



Once the application is started the all the functionalities will be available to the users through the Front-end web pages, which are under the static folder.

Users can open the browser and use the url below to login or signup :

http://<domain>:8080/Home.html or http://<domain>:8080/signup.html

Replace <domain> with the “localhost” while the application is running on your own system and you are accessing the pages from the same system. Else use the ip address of the system where the application is running.

Then the user will be able to login or register as per the demo screenshots shown in section 10.

Later users will be redirected to appropriate pages and will be able to access all the functionalities of the application.

9. USER APPLICATION INTERFACE

The following is a description of the User interfaces, the functions that are offered by The Airport System to the users and how the functions are implemented in SQL.

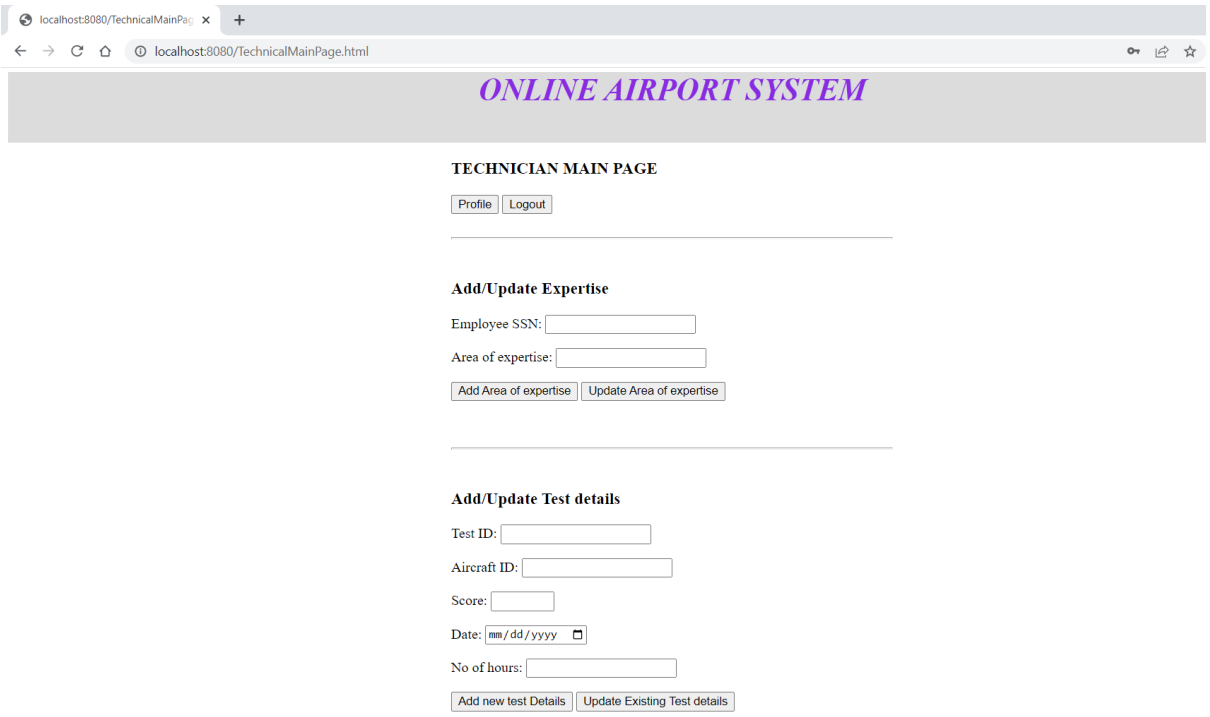
The functions offered by the system are as depicted by the context diagram.

User - Technician

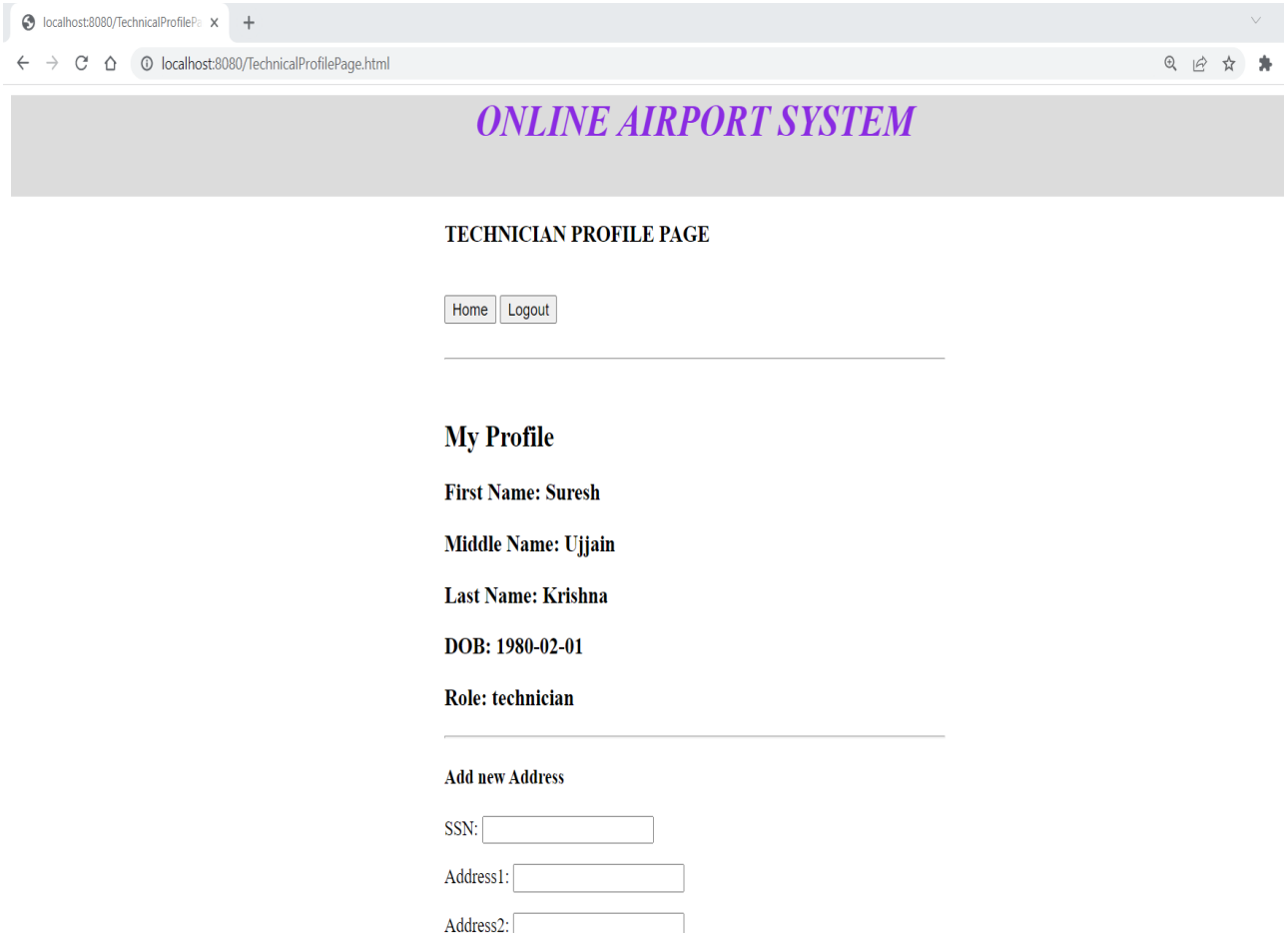
The technician's main page offers options to:

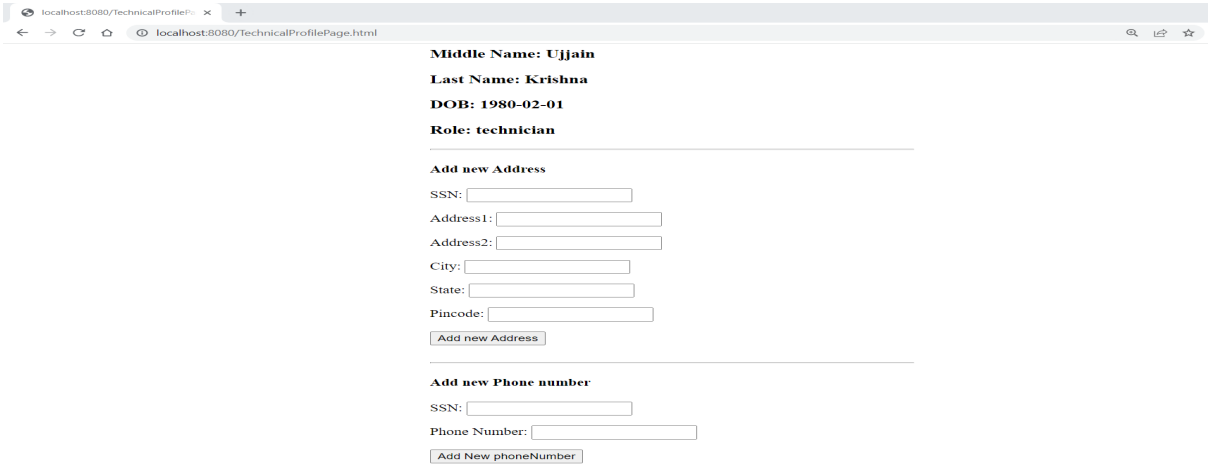
1. Update their expertise in models of aircrafts. Which is translated into a simple update operation in MySQL.

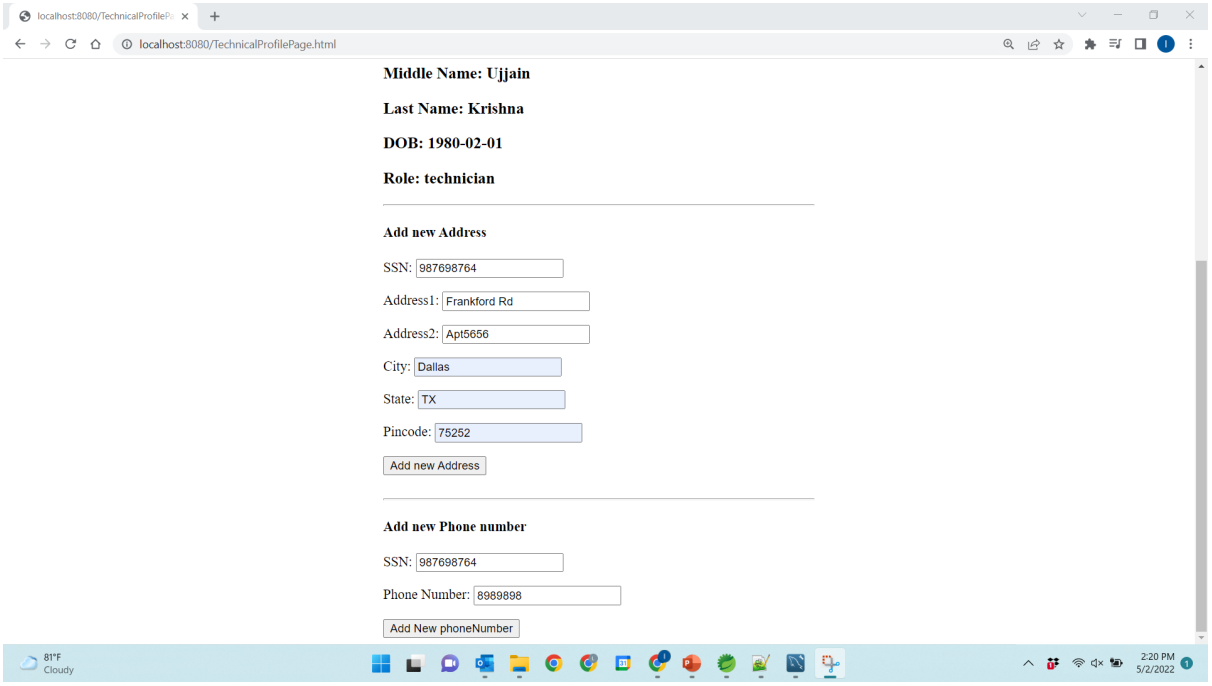
2. Add Test results of aircrafts they mend. Which is translated into an insert operation in MySQL.



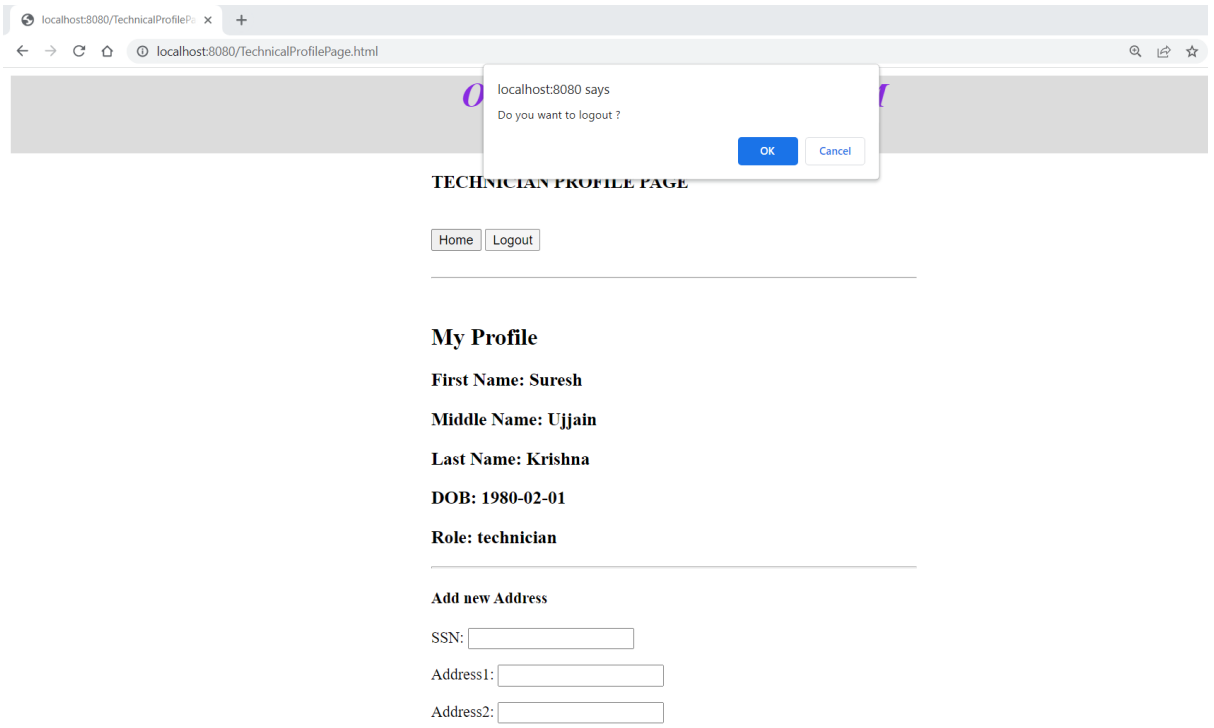
The technician profile page, displays and maintains up to date profile information of the Technicians.




localhost:8080/TechnicalProfilePage.html
Middle Name: Ujjain
Last Name: Krishna
DOB: 1980-02-01
Role: technician
Add new Address
SSN:
Address1:
Address2:
City:
State:
Pincode:
Add new Address
Add new Phone number
SSN:
Phone Number:
Add New phoneNumber


localhost:8080/TechnicalProfilePage.html
Middle Name: Ujjain
Last Name: Krishna
DOB: 1980-02-01
Role: technician
Add new Address
SSN: 987698764
Address1: Frankford Rd
Address2: Apt5656
City: Dallas
State: TX
Pincode: 75252
Add new Address
Add new Phone number
SSN: 987698764
Phone Number: 8989898
Add New phoneNumber
81°F
Cloudy
2:20 PM
5/2/2022

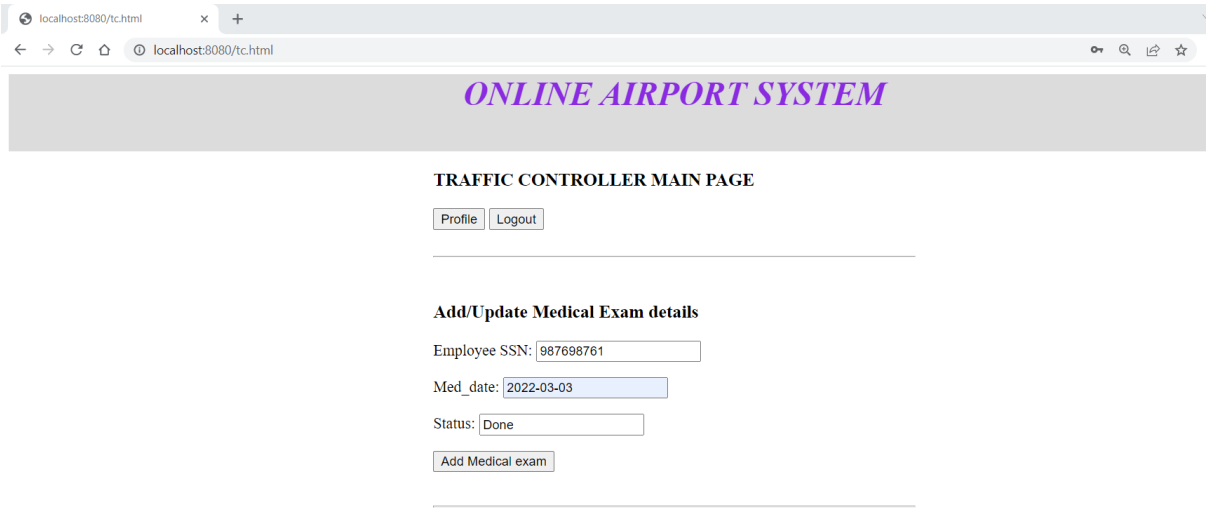
Technician Logout page



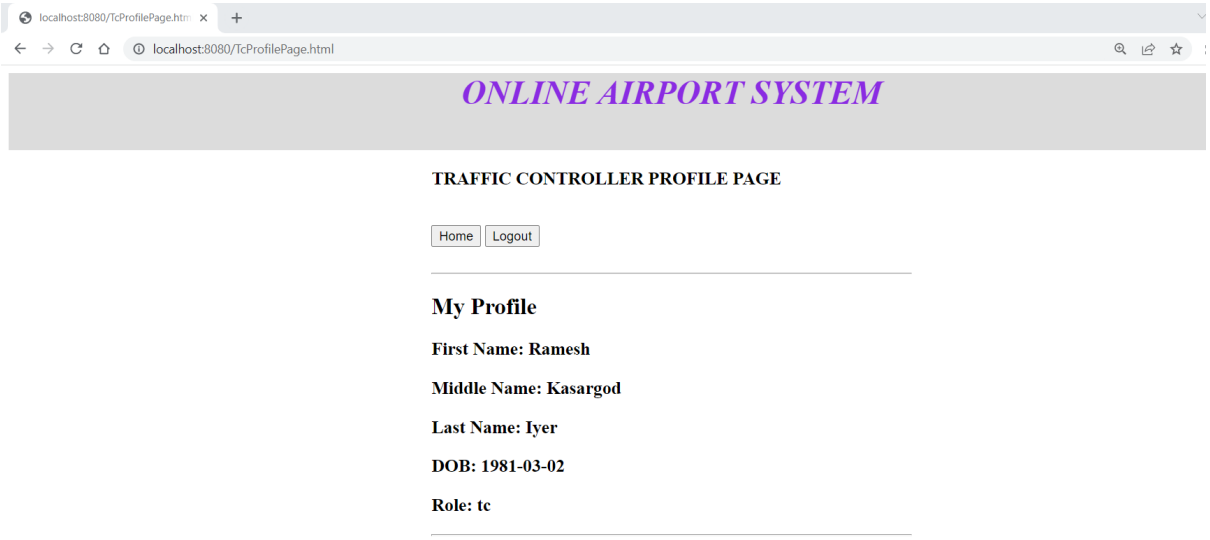
User - Traffic Controller

The Traffic Controller's main page offers options to:

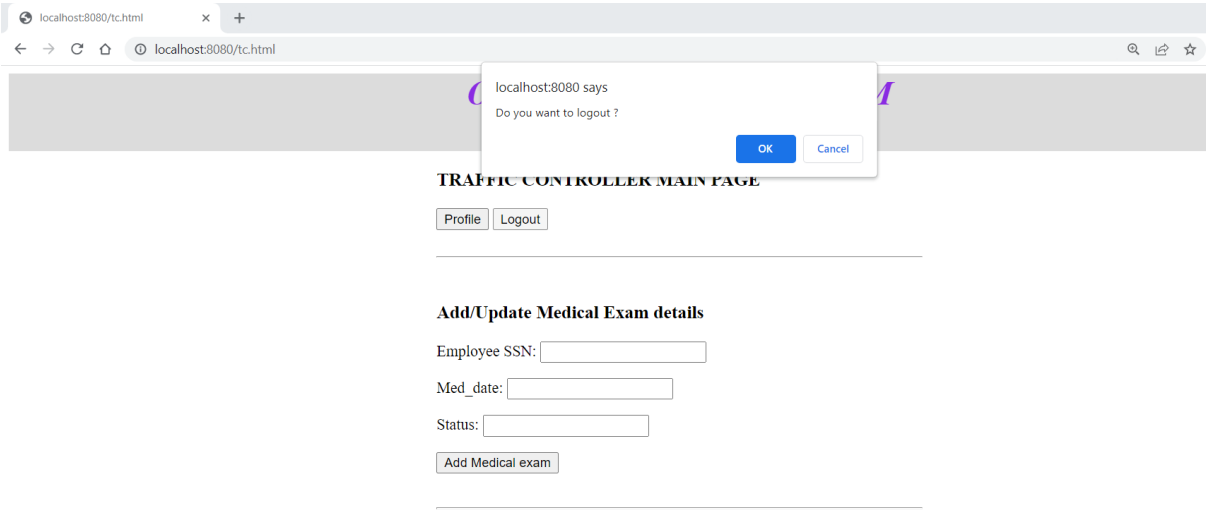
1. update his/her Most recent Medical Examinations details, which determine their status. Which is translated into a simple update operation in MySQL.



The Traffic Controller profile page, displays and maintains up to date profile information of the Traffic Controllers..



Traffic Controller Logout page

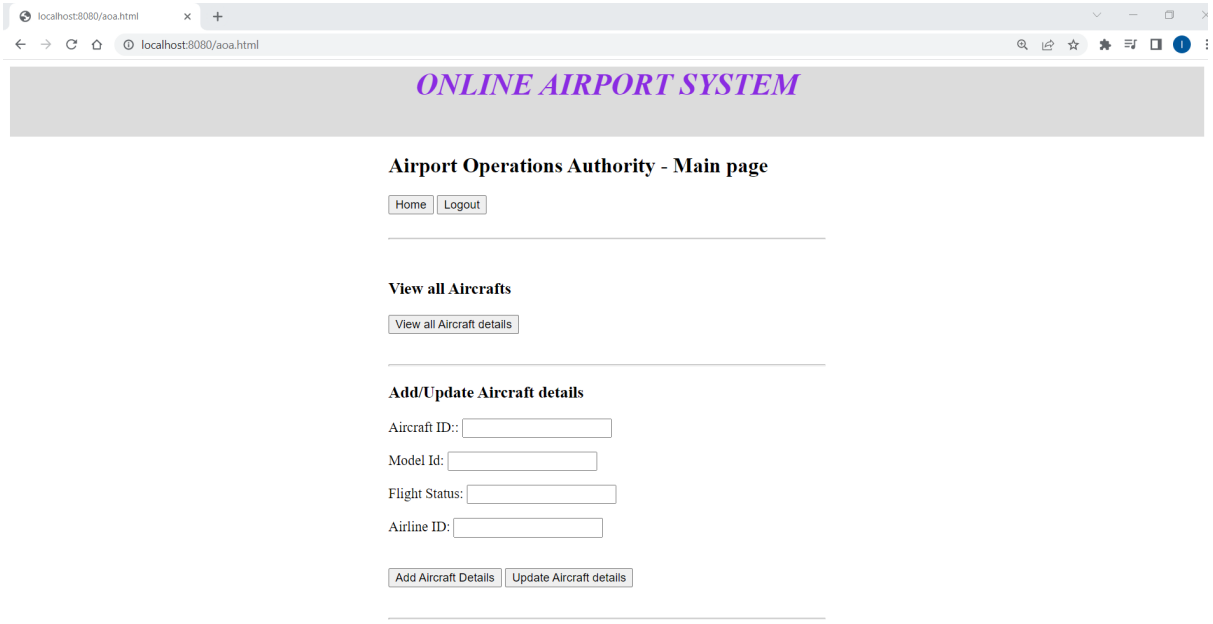


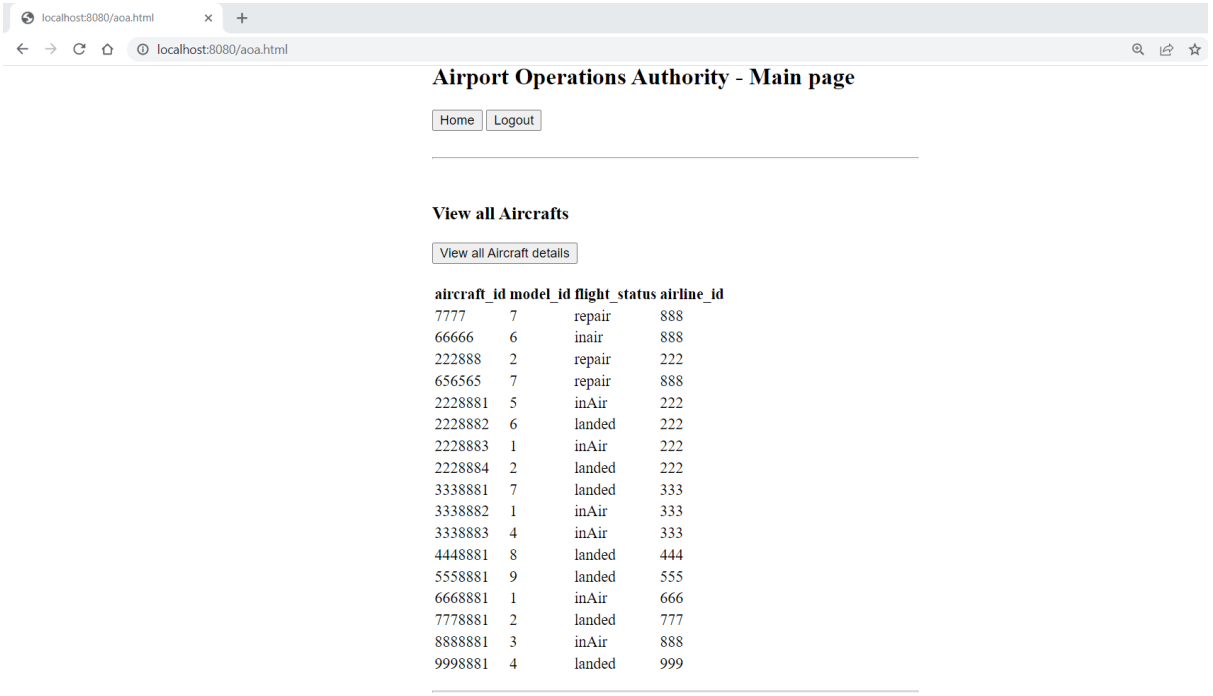
User - Airport Operations Authority

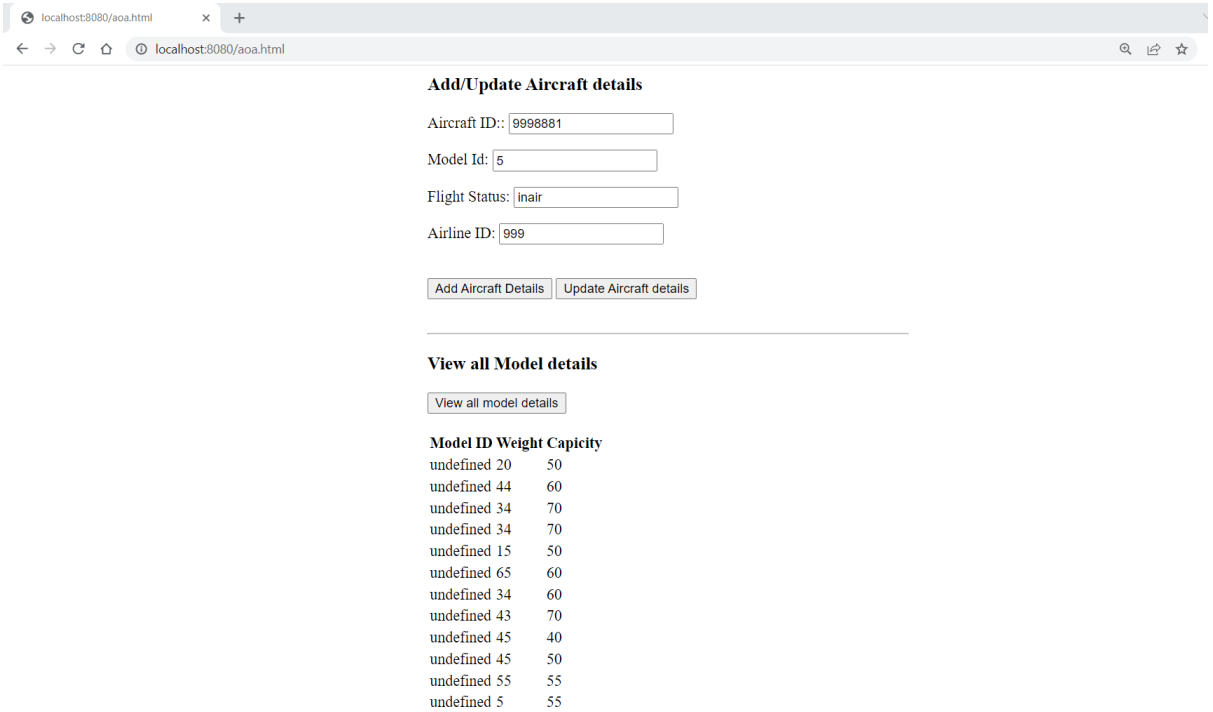
The airport Authority mailpage offers options like:

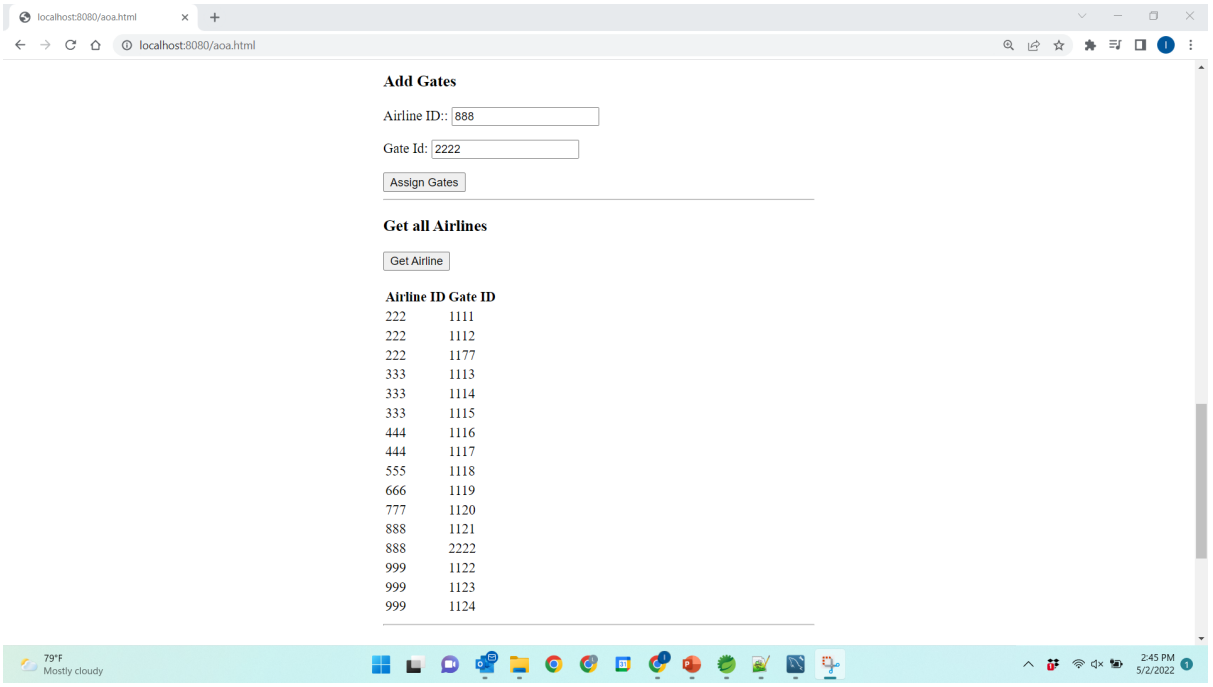
1. View all aircraft details, which translates to a select all operation in SQL.

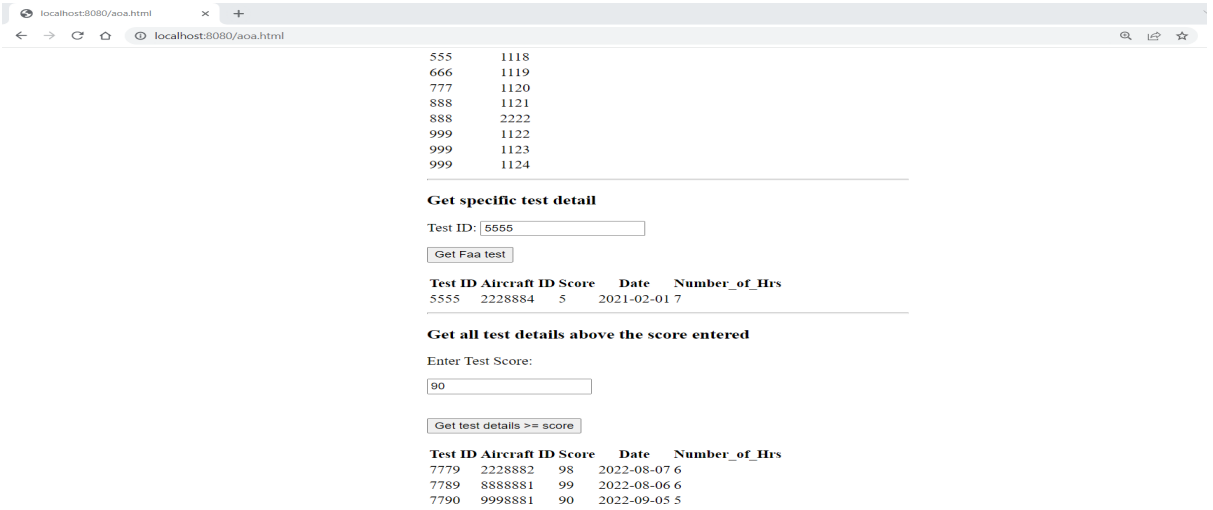
2. Update Aircraft details, which translates to a update operation in SQL.
3. View all model Details of aircrafts.
4. Add and assign gates to airlines, which translates to insert operation in SQL.
5. View all airlines.
6. Get Test details based on test_ID, translates to a conditional select in SQL.
7. Get Test details of aircrafts with a test score greater than the given value, translates to a conditional select in SQL.






localhost:8080/aoa.html
localhost:8080/aoa.html
Add/Update Aircraft details
Aircraft ID:: 9998881
Model Id: 5
Flight Status: inair
Airline ID: 999
Add Aircraft Details
Update Aircraft details
View all Model details
View all model details
Model ID Weight Capicity
undefined 20 50
undefined 44 60
undefined 34 70
undefined 34 70
undefined 15 50
undefined 65 60
undefined 34 60
undefined 43 70
undefined 45 40
undefined 45 50
undefined 55 55
undefined 5 55


localhost:8080/aoa.html
localhost:8080/aoa.html
Add Gates
Airline ID:: 888
Gate Id: 2222
Assign Gates
Get all Airlines
Get Airline
Airline ID Gate ID
222 1111
222 1112
222 1177
333 1113
333 1114
333 1115
444 1116
444 1117
555 1118
666 1119
777 1120
888 1121
888 2222
999 1122
999 1123
999 1124
79°F
Mostly cloudy
2:45 PM
5/2/2022



10. CONCLUSIONS AND FUTURE WORK

Our goal to design an Online Airport System is successfully completed which contains all the information related to the airport. This includes information about all the airplanes that are stationed and maintained at the airport. System serves various types of users like technicians, employees, traffic controllers and the Administrator.

We started the design with a context diagram and then gathered functional and non-functional requirements. This was followed up with the conceptual design of the database along with logical database schema and database normalization. After designing the system, we started the implementation using SQL queries for the backend. To render the data and for UI, we used HTML, CSS, JavaScript for smooth interaction for the users. Connection of the backend data and frontend was done using Java Springboot.

The future scope includes extending the system to help users access the system via mobile and involve more functionality like tracking and security.

11. REFERENCES

Fundamentals of Database Systems, 7th Edition, R. Elmasri and S. B. Navathe, AddisonWesley