

# DBMS Project

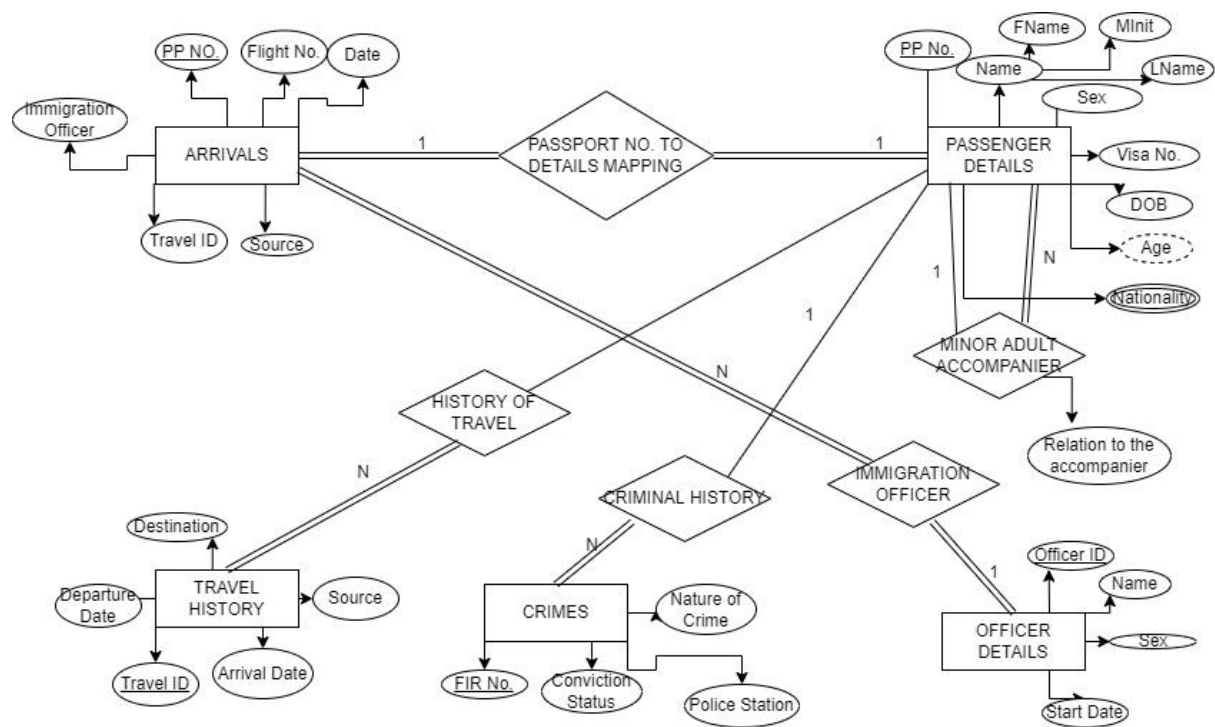
## Airport Immigration Management System

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<u>SEM</u>	<u>V</u>
<u>SEC</u>	<u>B</u>

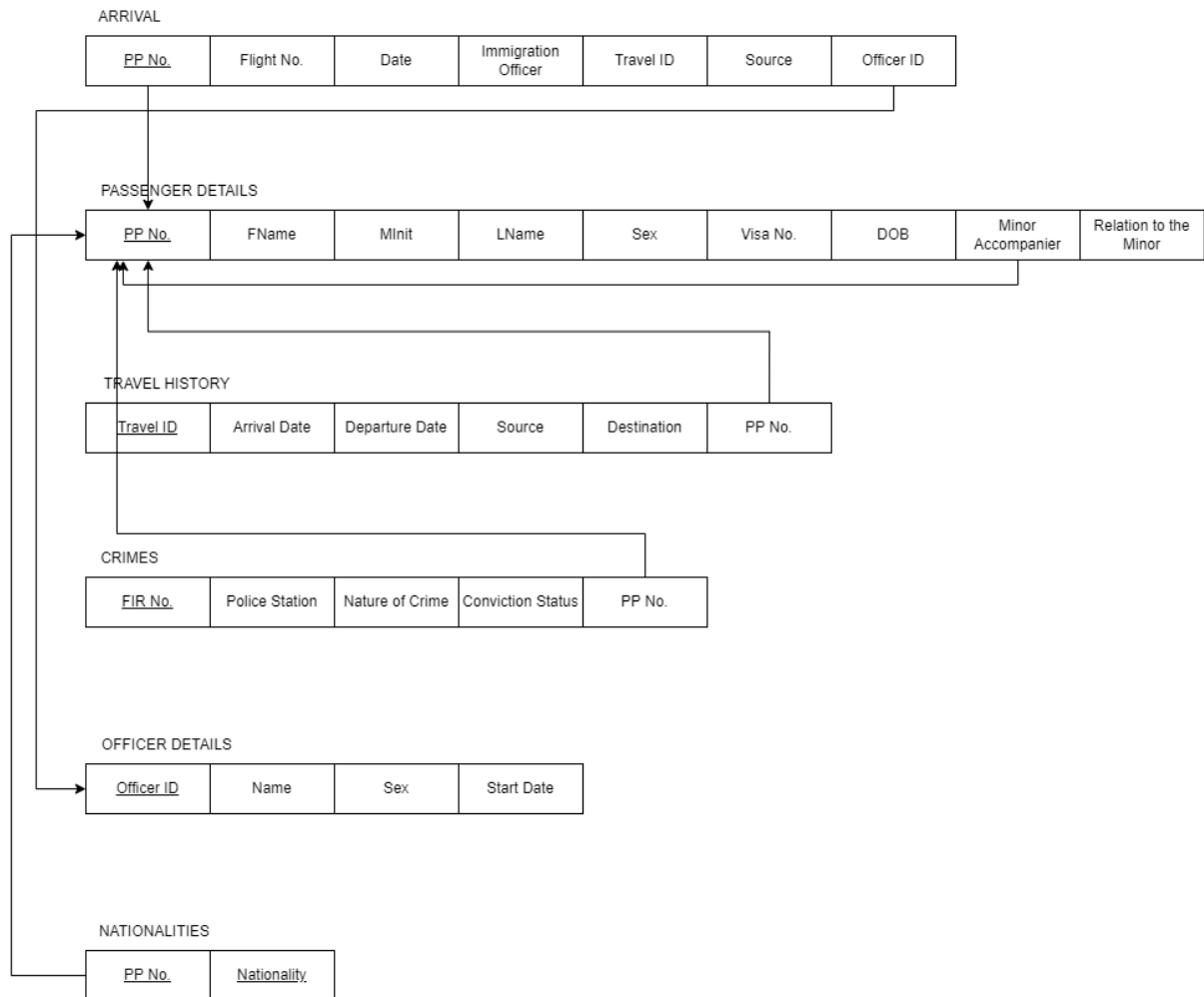
### **Project Description and Scope of Project**

The objective of the project was to create an Airport Immigration Management System. This system keeps track of all arrivals into the country, their travel history, i.e., their previous visits to India, the details of all passengers and their criminal histories. The motive of the project was to create a system to make the process of background checks more streamlined and efficient, allowing immigration officers to make informed decisions. The application also keeps track of the various immigration officers and their associated details.

## ER Diagram



## Relational Schema



## DDL Statements

```
create table IF NOT EXISTS passenger_details(pp_no varchar(8) not null primary
key, fname varchar(255) not null, minit varchar(1),
lname varchar(255) not null, sex varchar(1), visa_no varchar(8), dob date,
minor_accompanier varchar(8), relation_to_minor varchar(255), foreign key
(minor_accompanier)
references passenger_details(pp_no) on delete cascade);
```

```
create table IF NOT EXISTS travel_history(travel_id varchar(5) primary key not
null, date_of_arrival date not null,
date_of_departure date not null, source varchar(255) not null, destination
varchar(255) not null,
pp_no varchar(8) not null, foreign key (pp_no) references
passenger_details(pp_no) on delete cascade);
```

```
create table IF NOT EXISTS crime (fir_no varchar(6) not null primary key,
police_station varchar(255), nature_of_crime varchar(255) not null,
conviction_status varchar(255) not null, pp_no varchar(8) not null, foreign
key (pp_no) references passenger_details(pp_no) on delete cascade);
```

```
create table IF NOT EXISTS officer_details(officer_id varchar(4) not null
primary key, name varchar(255) not null, sex varchar(1),
join_date date not null);
```

```
create table IF NOT EXISTS arrival(pp_no varchar(8) not null primary key,
flight_no varchar(4), date_of_arrival date,
immigration_officer varchar(255), travel_id varchar(5), source varchar(255),
officer_id varchar(4),
foreign key (pp_no) references passenger_details(pp_no) on delete cascade,
foreign key (officer_id) references officer_details(officer_id) on delete
cascade);
```

```
create table IF NOT EXISTS nationalities(pp_no varchar(8) not null,
nationality varchar(100) not null,
foreign key (pp_no) references passenger_details(pp_no) on delete cascade,
primary key(pp_no, nationality));
```

Populating Database:

Menu

Read

AIRPORT IMMIGRATION MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Choose the Table:

Table to Read

Arrival

View all Arrivals

	Passport Number	Flight Number	Date of Arrival	Immigration Officer	Travel ID	Source	Officer ID
0	12345678	1234	2022-11-13	Rashmi Roy	54321	JFK	5249
1	23741567	1234	2022-11-02	Rahul Srivastava	42728	LHR	3011
2	67427999	2375	2022-11-02	Rashmi Roy	52469	MEX	5249
3	78426777	2375	2022-11-02	Rashmi Roy	72678	MEX	5249

Menu

Read

By Atharva S Gadad - PES1UG20CS088

Choose the Table:

Table to Read

Passenger Details

View all Passengers

	Passport Number	First Name	Middle Initial	Last Name	Sex	Visa Number	Date of Birth
0	12345678	Peter	<NA>	Parker	M	52426944	2013-11-06
1	12364598	Emanuel	<NA>	Ortega	<NA>	<NA>	2022-11-02
2	23741567	Bruce	<NA>	Wayne	M	53446388	2012-12-12
3	56498721	X	<NA>	Z	F	<NA>	2012-11-15
4	67427999	Jose	X	Escobar-Martinez	M	42556388	2020-02-05
5	73472361	Sakura	O	Minamoto	F	99645879	2013-11-04
6	78426777	Sofia	O	Martinez	F	42446388	2014-01-08
7	78456968	Kunta	I	Kinte	M	63435289	2012-11-15
8	87654321	Tony	<NA>	Stark	M	53446399	2012-11-14
9	88888888	ABCD	<NA>	EFGH	M	<NA>	2022-11-02

Menu

Read

By Atharva S Gadad - PES1UG20CS088

Choose the Table:

Table to Read

Travel History

View all Travel History

	Travel ID	Date of Arrival	Date of Departure	Source	Destination	Passport Number
0	12345	2022-11-02	2022-11-13	SFO	BOM	87654321
1	32789	2014-10-22	2014-11-27	LHR	BOM	23741567
2	42776	2022-11-02	2022-11-13	LHR	MAA	23741567
3	52732	2022-11-02	2022-11-13	MEX	MAD	73472361
4	54324	2022-11-02	2022-11-13	LAX	BOM	87654321
5	62467	2022-11-14	2022-11-09	CDG	CCU	78456968
6	64578	2022-11-08	2022-11-14	BJL	CCU	78456968
7	72678	2022-11-02	2022-11-13	MEX	MAA	78426777
8	72679	2022-11-02	2022-11-13	MEX	MAA	67427999

Menu

Read

AIRPORT IMMIGRATION MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Choose the Table:

Table to Read

Crimes

View all Crimes

	FIR Number	Name of the Police Station	Nature of Crime	Conviction Status	Passport Number
0	123456	Koramangala	Violent Assault	Convicted	78426777
1	654321	Dalal Street	Financial Fraud	Acquited	73472361

Menu

Read

AIRPORT IMMIGRATION MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Choose the Table:

Table to Read

Officer Details

View all Officers

	Officer ID	Name	Sex	Joining Date
0	3011	Rahul Srivastava	M	2012-11-14
1	5249	Rashmi Roy	F	2013-08-14

Menu

Read

By Atharva S Gadad - PES1UG20CS088

Choose the Table:

Table to Read

Nationalities

View all Nationalities

	Passport	Nationality
0	12345678	United States of America
1	23741567	France
2	23741567	United Kingdom
3	67427999	Mexico
4	67427999	Venezuela
5	73472361	Japan
6	78426777	Mexico
7	78456968	Gambia
8	87654321	Ireland
9	87654321	United States of America

## Join Queries

- 1) Selecting the first name, last name, nature of crime, and conviction status of all criminals

```
select fname, lname, nature_of_crime, conviction_status from
passenger_details inner join crime on
crime.pp_no=passenger_details.pp_no;
```

Menu  
Custom Query

## AIRPORT IMMIGRATION MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Enter the column names in the resultant dataframe seperated by ':'

First Name, Last Name, Crime, Conviction Status

Enter your query:

select fname, lname, nature\_of\_crime, conviction\_status from passenger\_details inner join crime on cri

View Results

	First Name	Last Name	Crime	Conviction Status
0	Sofia	Martinez	Violent Assault	Convicted
1	Sakura	Minamoto	Financial Fraud	Acquitted

- 2) Selecting each arrival and servicing immigration officer

```
with temp as (select * from officer_details natural join arrival)
select fname, lname, name from passenger_details inner join temp on
temp.pp_no=passenger_details.pp_no;
```

Menu  
Custom Query

## By Atharva S Gadad - PES1UG20CS088

Enter the column names in the resultant dataframe seperated by ':'

Passenger First Name, Passenger Last Name, Servicing Immigration Officer

Enter your query:

with temp as (select \* from officer\_details natural join arrival) select fname, lname, name from passeng

View Results

	Passenger First Name	Passenger Last Name	Servicing Immigration Officer
0	Bruce	Wayne	Rahul Srivastava
1	Peter	Parker	Rashmi Roy
2	Jose	Escobar-Martinez	Rashmi Roy
3	Sofia	Martinez	Rashmi Roy



### 3) Mapping all passengers to their various nationalities

```
select fname, lname, nationality from passenger_details natural join nationalities;
```

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Enter the column names in the resultant dataframe separated by "":  
First Name, Last Name, Nationality

Enter your query:  
select fname, lname, nationality from passenger\_details natural join nationalities;

View Results

	First Name	Last Name	Nationality
0	Peter	Parker	United States of America
1	Bruce	Wayne	France
2	Bruce	Wayne	United Kingdom
3	Jose	Escobar-Martinez	Mexico
4	Jose	Escobar-Martinez	Venezuela
5	Sakura	Minamoto	Japan
6	Sofia	Martinez	Mexico
7	Kunta	Kinte	Gambia
8	Tony	Stark	Ireland
9	Tony	Stark	United States of America

### 4) Linking each visit in travel history with the names of the passengers

```
select fname, lname, pp_no, date_of_arrival, date_of_departure, source, destination from passenger_details natural join travel_history;
```

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Enter the column names in the resultant dataframe separated by "":  
First Name, Last Name, Passport Number, Date of Arrival, Date of Departure, Source, Destination

Enter your query:  
select fname, lname, pp\_no, date\_of\_arrival, date\_of\_departure, source, destination from passenger\_d

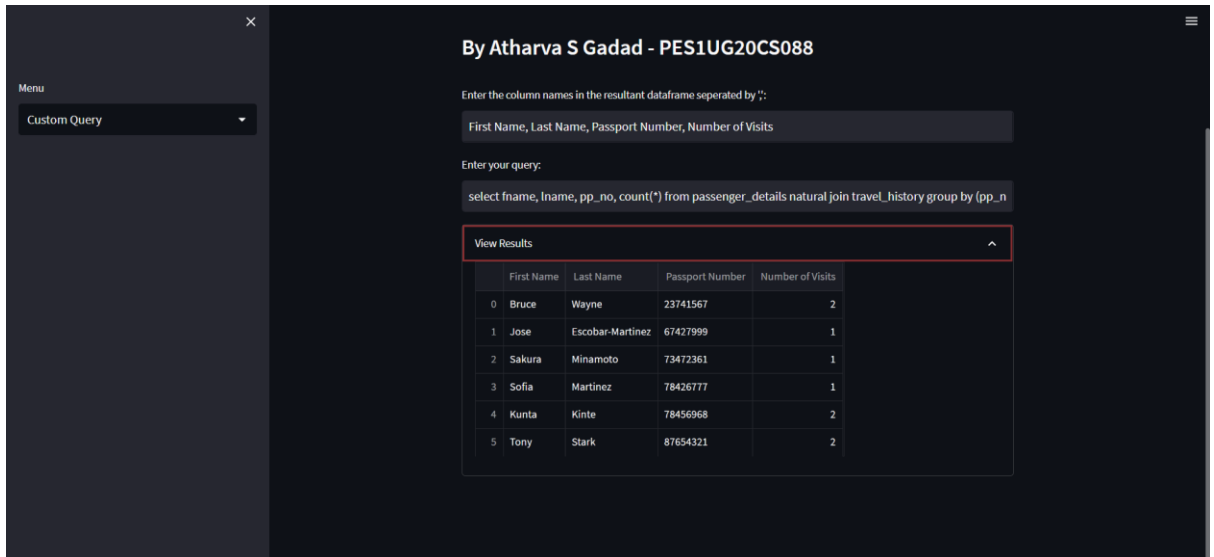
View Results

	First Name	Last Name	Passport Number	Date of Arrival	Date of Departure	Source	Desti
0	Tony	Stark	87654321	2022-11-02	2022-11-13	SFO	BOM
1	Bruce	Wayne	23741567	2014-10-22	2014-11-27	LHR	BOM
2	Bruce	Wayne	23741567	2022-11-02	2022-11-13	LHR	MAA
3	Sakura	Minamoto	73472361	2022-11-02	2022-11-13	MEX	MAD
4	Tony	Stark	87654321	2022-11-02	2022-11-13	LAX	BOM
5	Kunta	Kinte	78456968	2022-11-14	2022-11-09	CDG	CCU
6	Kunta	Kinte	78456968	2022-11-08	2022-11-14	BJL	CCU
7	Sofia	Martinez	78426777	2022-11-02	2022-11-13	MEX	MAA
8	Jose	Escobar-Martinez	67427999	2022-11-02	2022-11-13	MEX	MAA

## Aggregate Functions

- 1) Finding number of visits by each traveler

```
select fname, lname, pp_no, count(*) from passenger_details natural
join travel_history group by (pp_no);
```



Menu  
Custom Query

By Atharva S Gadad - PES1UG20CS088

Enter the column names in the resultant dataframe separated by "":  
First Name, Last Name, Passport Number, Number of Visits

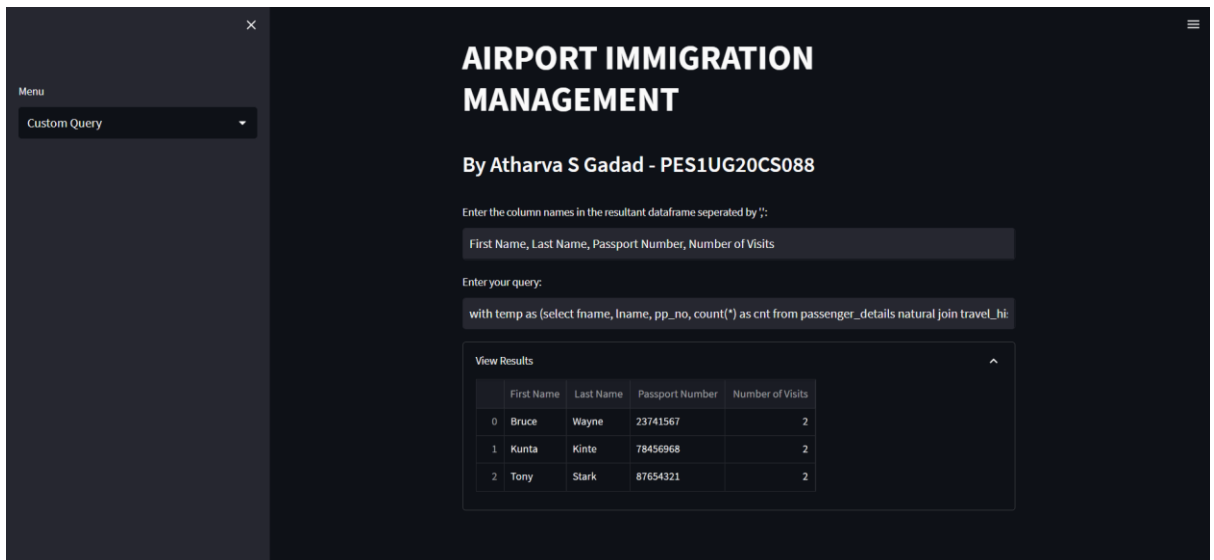
Enter your query:  
select fname, lname, pp\_no, count(\*) from passenger\_details natural join travel\_history group by (pp\_no)

View Results

	First Name	Last Name	Passport Number	Number of Visits
0	Bruce	Wayne	23741567	2
1	Jose	Escobar-Martinez	67427999	1
2	Sakura	Minamoto	73472361	1
3	Sofia	Martinez	78426777	1
4	Kunta	Kinte	78456968	2
5	Tony	Stark	87654321	2

- 2) Finding travelers with maximum visits

```
with temp as (select fname, lname, pp_no, count(*) as cnt from
passenger_details natural join travel_history group by (pp_no))
select * from temp where cnt=(select max(cnt) from temp);
```



Menu  
Custom Query

AIRPORT IMMIGRATION MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Enter the column names in the resultant dataframe separated by "":  
First Name, Last Name, Passport Number, Number of Visits

Enter your query:  
with temp as (select fname, lname, pp\_no, count(\*) as cnt from passenger\_details natural join travel\_history group by (pp\_no)) select \* from temp where cnt=(select max(cnt) from temp)

View Results

	First Name	Last Name	Passport Number	Number of Visits
0	Bruce	Wayne	23741567	2
1	Kunta	Kinte	78456968	2
2	Tony	Stark	87654321	2

3) Finding countries from which most visitors hail

```
with temp as (select nationality, count(*) as cnt from nationalities
group by (nationality)) select * from temp where cnt=(select
max(cnt) from temp);
```

The screenshot shows a web application titled "AIRPORT IMMIGRATION MANAGEMENT" by Atharva S Gadad - PES1UG20CS088. On the left is a sidebar with a "Menu" and a "Custom Query" dropdown. The main area has a title, author, and a form for entering a query. The "Enter the column names in the resultant dataframe separated by ':'" field contains "Country, Number of Visitors". The "Enter your query:" field contains the SQL query: `with temp as (select nationality, count(*) as cnt from nationalities group by (nationality)) select * from temp where cnt=(select max(cnt) from temp);`. Below the query input is a "View Results" section showing a table with 2 columns: "Country" and "Number of Visitors". The table has 2 rows: Mexico with 2 visitors and United States of America with 2 visitors.

	Country	Number of Visitors
0	Mexico	2
1	United States of America	2

4) Calculating average age of passengers

```
select avg(age) from passenger_details;
```

The screenshot shows the same web application as above. The "Enter the column names in the resultant dataframe separated by ':'" field contains "Age". The "Enter your query:" field contains the SQL query: `select avg(age) from passenger_details;`. Below the query input is a "View Results" section showing a table with 2 columns: "Age". The table has 1 row: 95000.

	Age
0	95000

## Set Operations

- 1) Finding all passengers details who have arrived recently

```
select fname, lname, pp_no from passenger_details where pp_no in
(select pp_no from passenger_details intersect select pp_no from
arrival);
```

Menu  
Custom Query

## AIRPORT IMMIGRATION MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Enter the column names in the resultant dataframe seperated by "":

Enter your query:

View Results

	First Name	Last Name	Passport Number
0	Peter	Parker	12345678
1	Bruce	Wayne	23741567
2	Jose	Escobar-Martinez	67427999
3	Sofia	Martinez	78426777

- 2) Finding all passengers who have not travelled recently

```
select fname, lname, pp_no from passenger_details where pp_no in
(select pp_no from passenger_details except select pp_no from
arrival);
```

Menu  
Custom Query

## AIRPORT IMMIGRATION MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Enter the column names in the resultant dataframe seperated by "":

Enter your query:

View Results

	First Name	Last Name	Passport Number
0	Emanuel	Ortega	12364598
1	X	Z	56498721
2	Sakura	Minamoto	73472361
3	Kunta	Kinte	78456968
4	Tony	Stark	87654321
5	ABCD	EFGH	88888888

### 3) Selecting details of criminals

```
select fname, lname, pp_no from passenger_details where pp_no in  
(select pp_no from passenger_details intersect select pp_no from  
crime);
```

Menu  
Custom Query

## AIRPORT IMMIGRATION MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Enter the column names in the resultant dataframe seperated by `;`:

First Name, Last Name, Passport Number

Enter your query:

enger\_details where pp\_no in (select pp\_no from passenger\_details intersect select pp\_no from crime);

View Results

	First Name	Last Name	Passport Number
0	Sakura	Minamoto	73472361
1	Sofia	Martinez	78426777

### 4) Selecting all passengers whose nationality information is unavailable

```
select fname, lname, pp_no from passenger_details where pp_no in  
(select pp_no from passenger_details except select pp_no from  
nationalities);
```

Menu  
Custom Query

## AIRPORT IMMIGRATION MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Enter the column names in the resultant dataframe seperated by `;`:

First Name, Last Name, Passport Number

Enter your query:

rr\_details where pp\_no in (select pp\_no from passenger\_details except select pp\_no from nationalities);

View Results

	First Name	Last Name	Passport Number
0	Emanuel	Ortega	12364598
1	X	Z	56498721
2	ABCD	EFGH	88888888

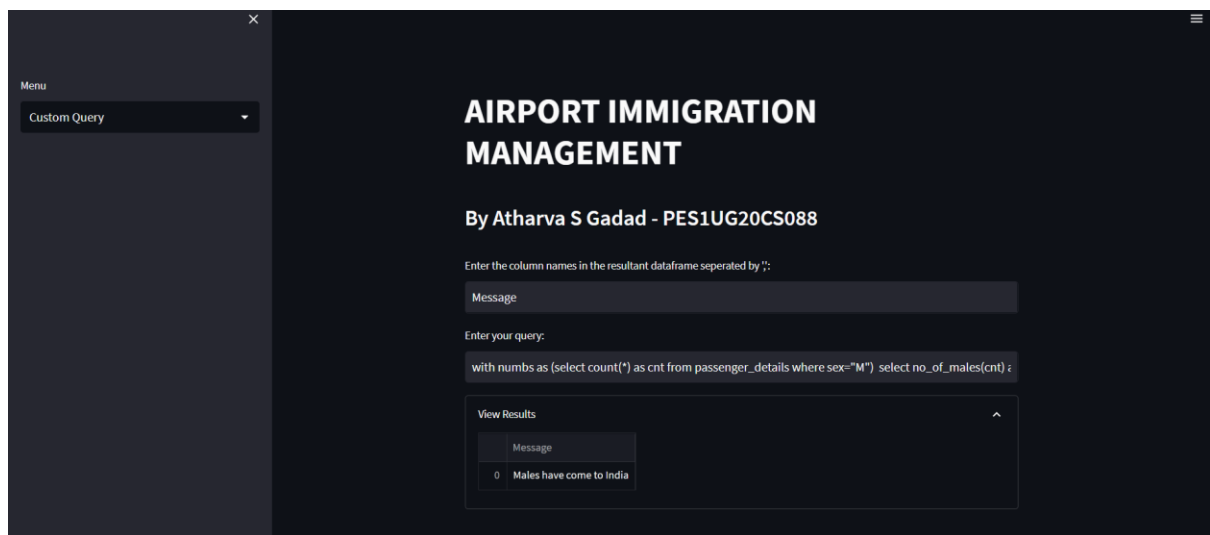
## Function

The function is to check if number of males who have come to India is greater than 1

```
DELIMITER $$
CREATE FUNCTION no_of_males(males int)
returns varchar(50)
deterministic
begin
declare return_value varchar(50);
if males>1 then
    set return_value="Males have come to India";
else
    set return_value="Males have not come to India";
end if;
return return_value;
end $$
DELIMITER ;
```

We will call the function as follows:

```
with numbs as (select count(*) as cnt from passenger_details where sex="M")
select no_of_males(cnt) as male_count from numbs;
```



We see that number of males in India is greater than 1

## Procedure

My procedure calculates the age of a selected passenger

```
DELIMITER $$
create procedure dob_age(in pp_no varchar(20), in dob date, out age int)
begin
update passenger_details set
passenger_details.age =DATE_FORMAT(FROM_DAYS(DATEDIFF(NOW(),dob)), '%Y') + 0
where passenger_details.pp_no=pp_no;
end;
$$
DELIMITER ;
```

In the back-end, it is called as follows

```
set @p0='<selected_pp_no>';
set @p1=(select passenger_details.dob from passenger_details where
passenger_details.pp_no=@p0);
set @p2=0;
call dob_age(@p0, @p1, @p2);
select * from passenger_details where passenger_details.pp_no=@p0;
```

In the front end, we choose any passport number from the drop-down menu and proceed as shown

The screenshot shows a web application titled "AIRPORT IMMIGRATION MANAGEMENT" by Atharva S Gadad. It features a sidebar menu with "Calculate Age" selected. The main content area includes a dropdown for "Passenger to Calculate Age for" with the value "73472361". Below this is a confirmation message: "Do you want to calculate age for ::73472361". A button labeled "Calculate Age for Selected Passenger" is present. At the bottom, a table titled "View Updated Passenger" displays the following data:

id	Last Name	Sex	Visa Number	Date of Birth	Minor Accompanier	Relation to the Minor	Age
0	Minamoto	F	99645879	2013-11-04	<NA>	<NA>	9

## Trigger

My trigger checks passengers' age, and if they are below a certain age, they must have a companion accompanying them. Else, during insert, an error is thrown

```
DELIMITER $$
CREATE TRIGGER check_birth_date
BEFORE INSERT
ON passenger_details FOR EACH ROW
BEGIN
DECLARE error_msg VARCHAR(255);
declare age int;
set age=DATE_FORMAT(FROM_DAYS(DATEDIFF(NOW(),new.dob)), '%Y') + 0;
SET error_msg = ('Minor, add a companion');
IF (age<3 and new.minor_accompanier is null) THEN
SIGNAL SQLSTATE '45000'
SET MESSAGE_TEXT = error_msg;
END IF;
END $$
DELIMITER ;
```

Menu  
Create

### Choose the Table:

Table to Create  
Passenger Details

Passport Number: 74623598 Visa Number: 56421964

First Name: A Date of Birth: 2022/11/16

Middle Initial: Minor Accompanier:

Last Name: B Relation to Minor:

Sex: M

Add Passenger

OperationalError: Minor, add a companion



## Cursor

```
import mariadb
mydb = mariadb.connect(
    user="atharva",
    password="my_password",
    host="127.0.0.1",
    port=3306,
    database="airport_immi_man"
)
c = mydb.cursor()
c.execute('source c:/users/shaileshgadam/desktop/dbms lab/project/tables
creation/tablesCreation.sql')
```

## CRUD Front-end

### 1) Create

Menu

Create

# AIRPORT IMMIGRATION MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Choose the Table:

Table to Create

Officer Details

Officer ID: 4352 Sex: M

Name: Prajwal Vikas Joining Date: 2022/10/02

Add Officer

Successfully added Officer: 4352

### 2) Read

Menu

Read

# AIRPORT IMMIGRATION MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Choose the Table:

Table to Read

Officer Details

View all Officers

	Officer ID	Name	Sex	Joining Date
0	3011	Rahul Srivastava	M	2012-11-14
1	4352	Prajwal Vikas	M	2022-10-02
2	5249	Rashmi Roy	F	2013-08-14

### 3) Update

Menu

Update

Table to Update

Officer Details

Officer to Edit

4352

Officer ID:

4352

Sex:

M

Name:

Ramesh Sharma

Joining Date:

2022/10/02

Update Officer

Successfully updated:: 4352 to ::4352

Updated Officers

	Officer ID	Name	Sex	Joining Date
0	3011	Rahul Srivastava	M	2012-11-14
1	4352	Ramesh Sharma	M	2022-10-02
2	5249	Rashmi Roy	F	2013-08-14

### 4) Delete

Menu

Delete

Choose the Table:

Table to Delete

Officer Details

Officer to Delete

4352

Do you want to delete ::4352

Delete Officer

Success!

Updated Officers

	Officer ID	Name	Sex	Joining Date
0	3011	Rahul Srivastava	M	2012-11-14
1	5249	Rashmi Roy	F	2013-08-14

## Custom SQL Statement in the Front-end

Menu

Custom Query

### By Atharva S Gadad - PES1UG20CS088

Enter the column names in the resultant dataframe seperated by " ":

First Name, Last Name, Nationality

Enter your query:

Select fname, lname, nationality from passenger\_details natural join nationalities;

View Results

	First Name	Last Name	Nationality
0	Peter	Parker	United States of America
1	Bruce	Wayne	France
2	Bruce	Wayne	United Kingdom
3	Jose	Escobar-Martinez	Mexico
4	Jose	Escobar-Martinez	Venezuela
5	Sakura	Minamoto	Japan
6	Sofia	Martinez	Mexico
7	Kunta	Kinte	Gambia
8	Tony	Stark	Ireland
9	Tony	Stark	United States of America

## Modifications

I was asked to add a trigger to ensure that people below a certain age are not allowed to travel. The results for the same are as shown below.

Menu  
Create

Choose the Table:

Table to Create  
Passenger Details

Passport Number: 74623598 Visa Number: 56421964

First Name: A Date of Birth: 2022/11/16

Middle Initial: Minor Accompanier:

Last Name: B Relation to Minor:

Sex: M

Add Passenger

OperationalError: Minor, add a companion

Another modification was adding on delete cascade constraint to all tables

By Atharva S Gadad - PES1UG20CS088

Choose the Table:

Table to Read  
Arrival

View all Arrivals

	Passport Number	Flight Number	Date of Arrival	Immigration Officer	Travel ID	Source	Officer ID
0	12345678	1234	2022-11-13	Rashmi Roy	54321	JFK	5249
1	23741567	1234	2022-11-02	Rahul Srivastava	42728	LHR	3011
2	67427999	2375	2022-11-02	Rashmi Roy	52469	MEX	5249
3	78426777	2375	2022-11-02	Rashmi Roy	72678	MEX	5249

Menu

Delete

Choose the Table:

Table to Delete

Officer Details

Officer to Delete

3011

Do you want to delete ::3011

Delete Officer

Success!

Updated Officers

	Officer ID	Name	Sex	Joining Date
0	5249	Rashmi Roy	F	2013-08-14

Menu

Read

AIRPORT IMMIGRATION  
MANAGEMENT

By Atharva S Gadad - PES1UG20CS088

Choose the Table:

Table to Read

Arrival

View all Arrivals

	Passport Number	Flight Number	Date of Arrival	Immigration Officer	Travel ID	Source	Officer ID
0	12345678	1234	2022-11-13	Rashmi Roy	54321	JFK	5249
1	67427999	2375	2022-11-02	Rashmi Roy	52469	MEX	5249
2	78426777	2375	2022-11-02	Rashmi Roy	72678	MEX	5249