



CS-GY 6083-B Principles of Database Systems

Project Report (Part 2)

SAFE FLY MANAGEMENT EXCELLENCE

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1. OVERVIEW OF THE PROJECT

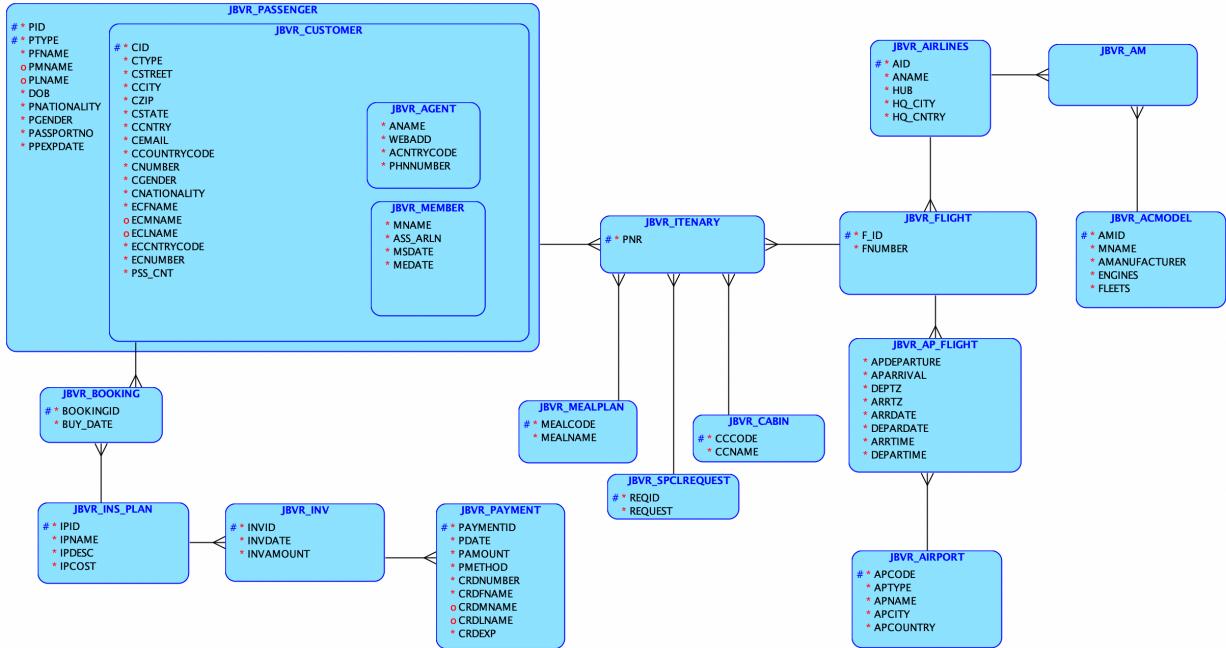
In this project, we created a relational database management system for Safe Fly Management Excellence. This section of the project examines the database design as well as a few preliminary records. The passengers table lists all of the people who will be traveling and for whom an insurance policy has been purchased. The customer is the passenger who purchases insurance for himself and one or additional passengers. Despite the fact that the insurance plan is purchased for the passengers, because the customer is the one who purchases it, an invoice is issued for him/her, and payments are made against those bills.

For making a flight reservation. Each passenger makes their own reservation. At least one cabin class and one meal plan are selected by each traveler. Any unique demands may or may not be made by the customer. In the case of a flight reservation, the invoice might be generated in one passenger's name for one or more passengers. Payments are made against these invoices, which may include many invoices for each invoice. The booking entity is also related to the flight entity, which determines which flight is being booked for which passenger.

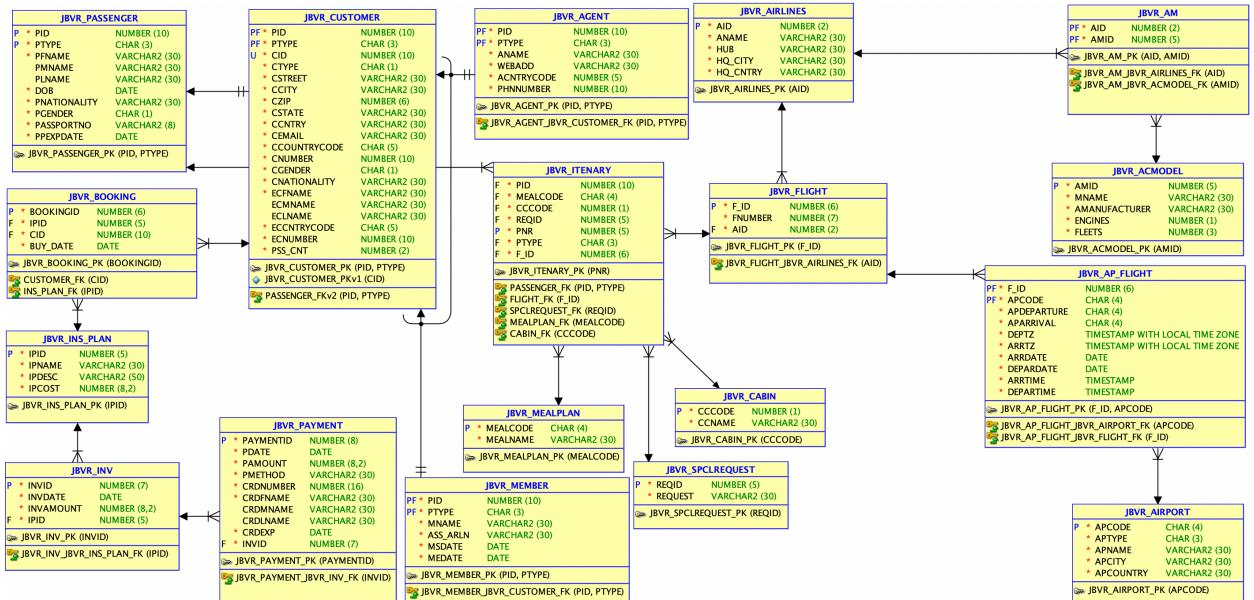
Airline, arrival airport, arrival time and time zone, departure airport, and departure time and time zone are some of the other flight details. The Airline table and the intersection of the Airport table and the Flight table provide these facts.

The Airline table is linked to the Airport table, with the intersect table indicating which hanger section an airline uses at an airport. The Airline table is also linked to the Airplane model table by an intersect entity, which indicates how many models that airline owns.

2. LOGICAL MODEL



3. RELATIONAL MODEL



4. ASSUMPTIONS

There are few assumptions that are made apart from the given business constraints, which are mentioned below:

- 1) Direct customers don't have any discriminating attributes from those of agents or those who have membership.
- 2) An agent can have multiple passengers, but a passenger will have only one agent.
- 3) A customer can have only one membership at a time.
- 4) No two airlines can offer same membership clubs.
- 5) An agent can also have membership of a club.
- 6) An airline may not offer any membership club.
- 7) No two airlines can offer same membership club.

5. OVERVIEW OF SOFTWARE, PROGRAMMING LANGUAGE AND DATABASE USED

1)HTML: HTML is the standard markup language for documents designed to be displayed in a web browser. HTML is used to define the layout, structure, and components of the frontend of a website. Images and other objects, such as interactive forms, can be embedded in web pages using HTML. Tags are used in the code to specify the semantics of page objects. For complete front-end development, it is frequently integrated with other languages such as CSS and JavaScript.

2)CSS: Cascading Style Sheets (CSS) is a language for creating style sheets. The World Wide Web Consortium first released it in 1996, and it was last updated in 2016. Since its beginnings, this language has undergone very little change. CSS is in charge of the appearance and styling of any web page. It specifies the layout, colors, and fonts of webpages whose contents are described by HTML codes. CSS is used to govern accessibility, content presentation flexibility, and the ability for numerous web pages to share formatting.

3)JavaScript: Along with HTML and CSS, another cornerstone technology underpinning the World Wide Web is JavaScript, which is sometimes abbreviated as JS. The majority of today's web pages use JavaScript to give functionality. It also includes a number of libraries that provide various functions to the web pages that are being created. JavaScript is in charge of all event-driven functions. When creating web sites, it's frequently utilized for graphical illustrations and functions.

4)PHP: PHP stands for Personal Home Page, but it is now known as Hypertext Preprocessor, and it was created in 1994. It's a server-side scripting language that can be integrated into HTML to make web pages more dynamic and interactive. On the other hand, PHP can connect to practically any database with ease. PHP can be run straight from the command line, and there are a number of PHP interpreters available.

5)SQL: The acronym SQL stands for Structured Query Language, and it is frequently mispronounced as "sequel." It's a standardized programming language for dealing with data in relational database management systems. It was first introduced in 1974 and has since been used to manage structured data in databases. SQL is a simple language to learn and apply. Many records can be accessed with a single SQL query. Apart from that, unlike previous languages, SQL does not require the specification of

indexes for each record to be accessed. DDL (Data Definition Language), DCL (Data Control Language), and DML (Data Management Language) are some of the subtypes (Data Manipulation Language). SQL is available in a variety of versions. We used Oracle SQL for this project.

6)DJANGO: Django is a Python based free and open-source web framework that follows the model-template-views architectural pattern. Its primary goal is to ease the creation of complex, database-driven website. In this project we used Django framework to create manager side, where the manager can view, create, delete, and search details of passengers and customers.

6. DDL CODE:

```
CREATE TABLE jbvr_acmodel (
    amid      NUMBER(5) NOT NULL,
    mname     VARCHAR2(30) NOT NULL,
    amanufacturer VARCHAR2(30) NOT NULL,
    engines   NUMBER(1) NOT NULL,
    fleets    NUMBER(3) NOT NULL
);

COMMENT ON COLUMN jbvr_acmodel.amid IS
'AIRCRAFT MODEL ID';

COMMENT ON COLUMN jbvr_acmodel.mname IS
'AIRCRAFT MODEL NAME';

COMMENT ON COLUMN jbvr_acmodel.amanufacturer IS
'AIRCRAFT MANUFACTURER NAME';

COMMENT ON COLUMN jbvr_acmodel.engines IS
'NUMBER OF ENGINES';

COMMENT ON COLUMN jbvr_acmodel.fleets IS
'NUMBER OF FLEETS';

ALTER TABLE jbvr_acmodel ADD CONSTRAINT jbvr_acmodel_pk PRIMARY KEY ( amid );

CREATE TABLE jbvr_agent (
    pid      NUMBER(10) NOT NULL,
    ptype    CHAR(3) NOT NULL,
    fname    VARCHAR2(30) NOT NULL,
    webadd   VARCHAR2(30) NOT NULL,
    acntrycode NUMBER(5) NOT NULL,
    phnnumber NUMBER(10) NOT NULL
);
```

```
COMMENT ON COLUMN jbvr_agent.pid IS
  'UNIQUE CUSTOMER ID';

COMMENT ON COLUMN jbvr_agent.ptype IS
  'TYPE OF PASSENGER';

COMMENT ON COLUMN jbvr_agent.ename IS
  'AGENT NAME';

COMMENT ON COLUMN jbvr_agent.webadd IS
  'WEB ADDRESS OF AGENT';

COMMENT ON COLUMN jbvr_agent.acntrycode IS
  'COUNTRY CODE OF AGENT';

COMMENT ON COLUMN jbvr_agent.phnnumber IS
  'PHONE NUMBER OF AGENT';

ALTER TABLE jbvr_agent ADD CONSTRAINT jbvr_agent_pk PRIMARY KEY ( pid,
  ptype );

CREATE TABLE jbvr_airlines (
  aid    NUMBER(2) NOT NULL,
  fname  VARCHAR2(30) NOT NULL,
  lname  VARCHAR2(30) NOT NULL,
  hub    VARCHAR2(30) NOT NULL,
  hq_city VARCHAR2(30) NOT NULL,
  hq_cntry VARCHAR2(30) NOT NULL
);

COMMENT ON COLUMN jbvr_airlines.aid IS
  'UNIQUE AIRLINE ID';

COMMENT ON COLUMN jbvr_airlines.fname IS
  'AIRLINE NAME';

COMMENT ON COLUMN jbvr_airlines.hub IS
  'MAIN HUB';

COMMENT ON COLUMN jbvr_airlines.hq_city IS
  'HEADQUARTER CITY';

COMMENT ON COLUMN jbvr_airlines.hq_cntry IS
  'COUNTRY OF AIRLINE';
```

```
ALTER TABLE jbvr_airlines ADD CONSTRAINT jbvr_airlines_pk PRIMARY KEY ( aid );
```

```
CREATE TABLE jbvr_airport (
    apcode CHAR(4) NOT NULL,
    aptype CHAR(3) NOT NULL,
    apname VARCHAR2(30) NOT NULL,
    apcity VARCHAR2(30) NOT NULL,
    apcountry VARCHAR2(30) NOT NULL
);
```

```
COMMENT ON COLUMN jbvr_airport.apcode IS
'UNIQUE AIRPORT CODE';
```

```
COMMENT ON COLUMN jbvr_airport.aptype IS
'AIRPORT TYPE';
```

```
COMMENT ON COLUMN jbvr_airport.apname IS
'AIRPORT NAME';
```

```
COMMENT ON COLUMN jbvr_airport.apcity IS
'AIRPORT CITY';
```

```
COMMENT ON COLUMN jbvr_airport.apcountry IS
'AIRPORT COUNTRY';
```

```
ALTER TABLE jbvr_airport ADD CONSTRAINT jbvr_airport_pk PRIMARY KEY ( apcode );
```

```
CREATE TABLE jbvr_am (
    aid NUMBER(2) NOT NULL,
    amid NUMBER(5) NOT NULL
);
```

```
ALTER TABLE jbvr_am ADD CONSTRAINT jbvr_am_pk PRIMARY KEY ( aid,
    amid );
```

```
CREATE TABLE jbvr_ap_flight (
    f_id NUMBER(6) NOT NULL,
    apcode CHAR(4) NOT NULL,
    apdeparture CHAR(4) NOT NULL,
    aparrival CHAR(4) NOT NULL,
    deptz TIMESTAMP WITH LOCAL TIME ZONE NOT NULL,
    arrtz TIMESTAMP WITH LOCAL TIME ZONE NOT NULL,
    arrdate DATE NOT NULL,
    depardate DATE NOT NULL,
```

```
arrrtime  TIMESTAMP NOT NULL,
departime  TIMESTAMP NOT NULL
);

COMMENT ON COLUMN jbvr_ap_flight.apdeparture IS
'DEPARTURE AIRPORT';

COMMENT ON COLUMN jbvr_ap_flight.aparrival IS
'ARRIVAL AIRPORT';

COMMENT ON COLUMN jbvr_ap_flight.deptz IS
'DEPARTURE TIME ZONE';

COMMENT ON COLUMN jbvr_ap_flight.arrtz IS
'ARRIVAL TIME ZONE';

COMMENT ON COLUMN jbvr_ap_flight.arrdate IS
'ARRIVAL DATE';

COMMENT ON COLUMN jbvr_ap_flight.depardate IS
'DEPARTURE DATE';

COMMENT ON COLUMN jbvr_ap_flight.arrrtime IS
'ARRIVAL TIME';

COMMENT ON COLUMN jbvr_ap_flight.departime IS
'DEPARTURE TIME';

ALTER TABLE jbvr_ap_flight ADD CONSTRAINT jbvr_ap_flight_pk PRIMARY KEY ( f_id,
apcode );

CREATE TABLE jbvr_booking (
bookingid NUMBER(6) NOT NULL,
ipid    NUMBER(5) NOT NULL,
cid     NUMBER(10) NOT NULL,
buy_date DATE NOT NULL
);

COMMENT ON COLUMN jbvr_booking.bookingid IS
'UNIQUE BOOKING ID';

COMMENT ON COLUMN jbvr_booking.buy_date IS
'INSURANCE STARTING DATE';
```

```
ALTER TABLE jbvr_booking ADD CONSTRAINT jbvr_booking_pk PRIMARY KEY ( bookingid );
```

```
CREATE TABLE jbvr_cabin (
    cccode NUMBER(1) NOT NULL,
    ccname VARCHAR2(30) NOT NULL
);
```

```
COMMENT ON COLUMN jbvr_cabin.cccode IS
'CABIN CLASS CODE';
```

```
COMMENT ON COLUMN jbvr_cabin.ccname IS
'CABIN CLASS NAME';
```

```
ALTER TABLE jbvr_cabin ADD CONSTRAINT jbvr_cabin_pk PRIMARY KEY ( cccode );
```

```
CREATE TABLE jbvr_customer (
    pid      NUMBER(10) NOT NULL,
    ptype    CHAR(3) NOT NULL,
    cid      NUMBER(10) NOT NULL,
    ctype    CHAR(1) NOT NULL,
    cstreeet VARCHAR2(30) NOT NULL,
    ccity    VARCHAR2(30) NOT NULL,
    czip     NUMBER(6) NOT NULL,
    cstate   VARCHAR2(30) NOT NULL,
    ccntry   VARCHAR2(30) NOT NULL,
    cemail   VARCHAR2(30) NOT NULL,
    ccountrycode CHAR(5) NOT NULL,
    cnumber  NUMBER(10) NOT NULL,
    cgender   CHAR(1) NOT NULL,
    cnationality VARCHAR2(30) NOT NULL,
    ecfname  VARCHAR2(30) NOT NULL,
    ecmname   VARCHAR2(30),
    eclname   VARCHAR2(30),
    eccntrycode CHAR(5) NOT NULL,
    ecnumber  NUMBER(10) NOT NULL,
    pss_cnt   NUMBER(2) NOT NULL
);
```

```
ALTER TABLE jbvr_customer
ADD CONSTRAINT ch_inh_jbvr_customer CHECK ( ctype IN ( 'A', 'D', 'M' ) );
```

```
COMMENT ON COLUMN jbvr_customer.pid IS
'UNIQUE CUSTOMER ID';
```

```
COMMENT ON COLUMN jbvr_customer.ptype IS
    'TYPE OF PASSENGER';

COMMENT ON COLUMN jbvr_customer.cid IS
    'UNIQUE CUSTOMER ID';

COMMENT ON COLUMN jbvr_customer ctype IS
    'TPYE OF CUSTOMER';

COMMENT ON COLUMN jbvr_customer.cstreet IS
    'ADDRESS';

COMMENT ON COLUMN jbvr_customer.ccity IS
    'CITY';

COMMENT ON COLUMN jbvr_customer.czip IS
    'ZIP CODE';

COMMENT ON COLUMN jbvr_customer.cstate IS
    'STATE OF CUSTOMER
';

COMMENT ON COLUMN jbvr_customer.ccntry IS
    'COUNTRY';

COMMENT ON COLUMN jbvr_customer.cemail IS
    'EMAIL ID OF CUSTOMER';

COMMENT ON COLUMN jbvr_customer.ccountrycode IS
    'COUNTRY CODE';

COMMENT ON COLUMN jbvr_customer.cnumber IS
    'CONTACT NUMBER';

COMMENT ON COLUMN jbvr_customer.cgender IS
    'GENDER: F FOR FEMALE, M FOR MALE AND O FOR OTHERS';

COMMENT ON COLUMN jbvr_customer.cnationality IS
    'NATIONALITY OF CUSTOMER';

COMMENT ON COLUMN jbvr_customer.ecfname IS
    'FIRST NAME OF EMERGENCY CONTACT';

COMMENT ON COLUMN jbvr_customer.ecmname IS
```

```

'MIDDLE NAME OF EMERGENCY CONTACT';

COMMENT ON COLUMN jbvr_customer.eclname IS
'LAST NAME OF EMERGENCY CONTACT';

COMMENT ON COLUMN jbvr_customer.eccntrycode IS
'COUNTRY CODE OF EMERGENCY CONTACT';

COMMENT ON COLUMN jbvr_customer.ecnumber IS
'EMERGENCY CONTACT PHONE NUMBER';

COMMENT ON COLUMN jbvr_customer.pss_cnt IS
'TOTAL NUMBER OF PASSENGERS';

ALTER TABLE jbvr_customer ADD CONSTRAINT jbvr_customer_pk PRIMARY KEY ( pid,
ptype );

ALTER TABLE jbvr_customer ADD CONSTRAINT jbvr_customer_pkv1 UNIQUE ( cid );

CREATE TABLE jbvr_flight (
    f_id    NUMBER(6) NOT NULL,
    fnumber NUMBER(7) NOT NULL,
    aid     NUMBER(2) NOT NULL
);

COMMENT ON COLUMN jbvr_flight.f_id IS
'UNIQUE FLIGHT ID';

COMMENT ON COLUMN jbvr_flight.fnumber IS
'FLIGHT NUMBER';

ALTER TABLE jbvr_flight ADD CONSTRAINT jbvr_flight_pk PRIMARY KEY ( f_id );

CREATE TABLE jbvr_ins_plan (
    ipid   NUMBER(5) NOT NULL,
    ipname VARCHAR2(30) NOT NULL,
    ipdesc VARCHAR2(50) NOT NULL,
    ipcost NUMBER(8, 2) NOT NULL
);

COMMENT ON COLUMN jbvr_ins_plan.ipid IS
'UNIQUE INSURANCE PLAN ID';

COMMENT ON COLUMN jbvr_ins_plan.ipname IS

```

```

'INSURANCE PLAN NAME';

COMMENT ON COLUMN jbvr_ins_plan.ipdesc IS
'INSURANCE PLAN DESCRIPTION';

COMMENT ON COLUMN jbvr_ins_plan.ipcost IS
'INSURANCE PLAN IN USD';

ALTER TABLE jbvr_ins_plan ADD CONSTRAINT jbvr_ins_plan_pk PRIMARY KEY ( ipid );

CREATE TABLE jbvr_inv (
    invid NUMBER(7) NOT NULL,
    invdate DATE NOT NULL,
    invamount NUMBER(8, 2) NOT NULL,
    ipid NUMBER(5) NOT NULL
);

COMMENT ON COLUMN jbvr_inv.invid IS
'UNIQUE INVOICE ID';

COMMENT ON COLUMN jbvr_inv.invdate IS
'INVOICE DATE';

COMMENT ON COLUMN jbvr_inv.invamount IS
'TOTAL AMOUNT';

ALTER TABLE jbvr_inv ADD CONSTRAINT jbvr_inv_pk PRIMARY KEY ( invid );

CREATE TABLE jbvr_itenary (
    pid NUMBER(10) NOT NULL,
    mealcode CHAR(4) NOT NULL,
    cccode NUMBER(1) NOT NULL,
    reqid NUMBER(5) NOT NULL,
    pnr NUMBER(5) NOT NULL,
    ptype CHAR(3) NOT NULL,
    f_id NUMBER(6) NOT NULL
);

COMMENT ON COLUMN jbvr_itenary.pnr IS
'UNIQUE ITENARY ID';

ALTER TABLE jbvr_itenary ADD CONSTRAINT jbvr_itenary_pk PRIMARY KEY ( pnr );

CREATE TABLE jbvr_mealplan (

```

```

mealcode CHAR(4) NOT NULL,
mealname VARCHAR2(30) NOT NULL
);

COMMENT ON COLUMN jbvr_mealplan.mealcode IS
'MEAL PLAN CODE';

COMMENT ON COLUMN jbvr_mealplan.mealname IS
'MEAL PLAN DESCRIPTION';

ALTER TABLE jbvr_mealplan ADD CONSTRAINT jbvr_mealplan_pk PRIMARY KEY ( mealcode );

CREATE TABLE jbvr_member (
    pid NUMBER(10) NOT NULL,
    ptype CHAR(3) NOT NULL,
    mname VARCHAR2(30) NOT NULL,
    ass_arln VARCHAR2(30) NOT NULL,
    msdate DATE NOT NULL,
    medate DATE NOT NULL
);

COMMENT ON COLUMN jbvr_member.pid IS
'UNIQUE CUSTOMER ID';

COMMENT ON COLUMN jbvr_member.ptype IS
'TYPE OF PASSENGER';

COMMENT ON COLUMN jbvr_member.mname IS
'MEMBERSHIP NAME';

COMMENT ON COLUMN jbvr_member.ass_arln IS
'ASSOCIATED AIRLINE';

COMMENT ON COLUMN jbvr_member.msdate IS
'MEMBERSHIP START DATE';

COMMENT ON COLUMN jbvr_member.medate IS
'MEMBERSHIP END DATE';

ALTER TABLE jbvr_member ADD CONSTRAINT jbvr_member_pk PRIMARY KEY ( pid,
ptype );

CREATE TABLE jbvr_passenger (
    pid NUMBER(10) NOT NULL,

```

```
ptype    CHAR(3) NOT NULL,
pname    VARCHAR2(30) NOT NULL,
pmname   VARCHAR2(30),
plname   VARCHAR2(30),
dob      DATE NOT NULL,
pnationality VARCHAR2(30) NOT NULL,
pgender   CHAR(1) NOT NULL,
passportno  VARCHAR2(8) NOT NULL,
ppexpdate  DATE NOT NULL
);

COMMENT ON COLUMN jbvr_passenger.pid IS
'UNIQUE CUSTOMER ID';

COMMENT ON COLUMN jbvr_passenger.ptype IS
'TYPE OF PASSENGER';

COMMENT ON COLUMN jbvr_passenger.pfname IS
'PASSENGER FIRST NAME';

COMMENT ON COLUMN jbvr_passenger.pmname IS
'PASSENGER MIDDLE NAME';

COMMENT ON COLUMN jbvr_passenger.plname IS
'PASSENGER LAST NAME';

COMMENT ON COLUMN jbvr_passenger.dob IS
'DATE OF BIRTH OF PASSENGER';

COMMENT ON COLUMN jbvr_passenger.pnationality IS
'PASSENGER"S NATIONALITY';

COMMENT ON COLUMN jbvr_passenger.pgender IS
'PASSENGER"S GENDER';

COMMENT ON COLUMN jbvr_passenger.passportno IS
'PASSENGER"S PASSPORT NUMBER';

COMMENT ON COLUMN jbvr_passenger.ppexpdate IS
'PASSENGER"S PASSPORT EXPIRY DATE';

ALTER TABLE jbvr_passenger ADD CONSTRAINT jbvr_passenger_pk PRIMARY KEY ( pid,
ptype );
```

```
CREATE TABLE jbvr_payment (
    paymentid NUMBER(8) NOT NULL,
    pdate DATE NOT NULL,
    pamount NUMBER(8, 2) NOT NULL,
    pmethod VARCHAR2(30) NOT NULL,
    crdnumber NUMBER(16) NOT NULL,
    crdfname VARCHAR2(30) NOT NULL,
    crdmname VARCHAR2(30),
    crdlname VARCHAR2(30),
    crdexp DATE NOT NULL,
    invid NUMBER(7) NOT NULL
);

COMMENT ON COLUMN jbvr_payment.paymentid IS
    'PAYMENT ID';

COMMENT ON COLUMN jbvr_payment.pdate IS
    'PAYMENT DATE';

COMMENT ON COLUMN jbvr_payment.pamount IS
    'PAYMENT AMOUNT';

COMMENT ON COLUMN jbvr_payment.pmethod IS
    'PAYMENT METHOD';

COMMENT ON COLUMN jbvr_payment.crdnumber IS
    'CARD NUMBER';

COMMENT ON COLUMN jbvr_payment.crdfname IS
    'FIRST NAME ON CARD';

COMMENT ON COLUMN jbvr_payment.crdmname IS
    'MIDDLE NAME ON CARD';

COMMENT ON COLUMN jbvr_payment.crdlname IS
    'LAST NAME ON CARD';

COMMENT ON COLUMN jbvr_payment.crdexp IS
    'EXPIRY DATE ON CARD';

ALTER TABLE jbvr_payment ADD CONSTRAINT jbvr_payment_pk PRIMARY KEY ( paymentid );

CREATE TABLE jbvr_spclrequest (
    reqid NUMBER(5) NOT NULL,
```

```
        request VARCHAR2(30) NOT NULL
    );
COMMENT ON COLUMN jbvr_spclrequest.reqid IS
    'UNIQUE SPECIAL REQUEST ID';

COMMENT ON COLUMN jbvr_spclrequest.request IS
    'SPECIAL REQUESTS';

ALTER TABLE jbvr_spclrequest ADD CONSTRAINT jbvr_spclrequest_pk PRIMARY KEY ( reqid );

ALTER TABLE jbvr_itenary
    ADD CONSTRAINT cabin_fk FOREIGN KEY ( cccode )
        REFERENCES jbvr_cabin ( cccode );

ALTER TABLE jbvr_booking
    ADD CONSTRAINT customer_fk FOREIGN KEY ( cid )
        REFERENCES jbvr_customer ( cid );

ALTER TABLE jbvr_itenary
    ADD CONSTRAINT flight_fk FOREIGN KEY ( f_id )
        REFERENCES jbvr_flight ( f_id );

ALTER TABLE jbvr_booking
    ADD CONSTRAINT ins_plan_fk FOREIGN KEY ( ipid )
        REFERENCES jbvr_ins_plan ( ipid );

ALTER TABLE jbvr_agent
    ADD CONSTRAINT jbvr_agent_jbvr_customer_fk FOREIGN KEY ( pid,
        ptype )
        REFERENCES jbvr_customer ( pid,
        ptype );

ALTER TABLE jbvr_am
    ADD CONSTRAINT jbvr_am_jbvr_acmodel_fk FOREIGN KEY ( amid )
        REFERENCES jbvr_acmodel ( amid );

ALTER TABLE jbvr_am
    ADD CONSTRAINT jbvr_am_jbvr_airlines_fk FOREIGN KEY ( aid )
        REFERENCES jbvr_airlines ( aid );

ALTER TABLE jbvr_ap_flight
    ADD CONSTRAINT jbvr_ap_flight_jbvr_airport_fk FOREIGN KEY ( apcode )
        REFERENCES jbvr_airport ( apcode );
```

```
ALTER TABLE jbvr_ap_flight
  ADD CONSTRAINT jbvr_ap_flight_jbvr_flight_fk FOREIGN KEY ( f_id )
    REFERENCES jbvr_flight ( f_id );
```

```
ALTER TABLE jbvr_flight
  ADD CONSTRAINT jbvr_flight_jbvr_airlines_fk FOREIGN KEY ( aid )
    REFERENCES jbvr_airlines ( aid );
```

```
ALTER TABLE jbvr_inv
  ADD CONSTRAINT jbvr_inv_jbvr_ins_plan_fk FOREIGN KEY ( ipid )
    REFERENCES jbvr_ins_plan ( ipid );
```

```
ALTER TABLE jbvr_member
  ADD CONSTRAINT jbvr_member_jbvr_customer_fk FOREIGN KEY ( pid,
    ptype )
    REFERENCES jbvr_customer ( pid,
    ptype );
```

```
ALTER TABLE jbvr_payment
  ADD CONSTRAINT jbvr_payment_jbvr_inv_fk FOREIGN KEY ( invid )
    REFERENCES jbvr_inv ( invid );
```

```
ALTER TABLE jbvr_itenary
  ADD CONSTRAINT mealplan_fk FOREIGN KEY ( mealcode )
    REFERENCES jbvr_mealplan ( mealcode );
```

```
ALTER TABLE jbvr_itenary
  ADD CONSTRAINT passenger_fk FOREIGN KEY ( pid,
    ptype )
    REFERENCES jbvr_passenger ( pid,
    ptype );
```

```
ALTER TABLE jbvr_customer
  ADD CONSTRAINT passenger_fkv2 FOREIGN KEY ( pid,
    ptype )
    REFERENCES jbvr_passenger ( pid,
    ptype );
```

```
ALTER TABLE jbvr_itenary
  ADD CONSTRAINT spclrequest_fk FOREIGN KEY ( reqid )
    REFERENCES jbvr_spclrequest ( reqid );
```

```
CREATE OR REPLACE TRIGGER arc_fkarc_2_jbvr_member BEFORE
```

```

INSERT OR UPDATE OF pid, ptype ON jbvr_member
FOR EACH ROW
DECLARE
    d CHAR(1);
BEGIN
    SELECT
        a ctype
    INTO d
    FROM
        jbvr_customer a
    WHERE
        a.pid = :new.pid
    AND a.ptype = :new.ptype;

    IF ( d IS NULL OR d <> 'M' ) THEN
        raise_application_error(-20223,
            'FK JBVR_MEMBER_JBVR_CUSTOMER_FK in Table JBVR_MEMBER violates Arc
constraint on Table JBVR_CUSTOMER - discriminator column CTYPE doesn''t have value "M"');
    END IF;

EXCEPTION
    WHEN no_data_found THEN
        NULL;
    WHEN OTHERS THEN
        RAISE;
END;
/

CREATE OR REPLACE TRIGGER arc_fkarc_2_jbvr_agent BEFORE
    INSERT OR UPDATE OF pid, ptype ON jbvr_agent
    FOR EACH ROW
DECLARE
    d CHAR(1);
BEGIN
    SELECT
        a ctype
    INTO d
    FROM
        jbvr_customer a
    WHERE
        a.pid = :new.pid
    AND a.ptype = :new.ptype;

    IF ( d IS NULL OR d <> 'A' ) THEN

```

```

    raise_application_error(-20223,
        'FK JBVR_AGENT_JBVR_CUSTOMER_FK in Table JBVR_AGENT violates Arc
constraint on Table JBVR_CUSTOMER - discriminator column CTYPE doesn''t have value "A");
    END IF;

EXCEPTION
    WHEN no_data_found THEN
        NULL;
    WHEN OTHERS THEN
        RAISE;
END;
/

```

-- Oracle SQL Developer Data Modeler Summary Report:

```

--
-- CREATE TABLE          18
-- CREATE INDEX          0
-- ALTER TABLE          37
-- CREATE VIEW           0
-- ALTER VIEW            0
-- CREATE PACKAGE         0
-- CREATE PACKAGE BODY      0
-- CREATE PROCEDURE        0
-- CREATE FUNCTION         0
-- CREATE TRIGGER          2
-- ALTER TRIGGER           0
-- CREATE COLLECTION TYPE     0
-- CREATE STRUCTURED TYPE      0
-- CREATE STRUCTURED TYPE BODY    0
-- CREATE CLUSTER           0
-- CREATE CONTEXT            0
-- CREATE DATABASE           0
-- CREATE DIMENSION          0
-- CREATE DIRECTORY           0
-- CREATE DISK GROUP          0
-- CREATE ROLE                0
-- CREATE ROLLBACK SEGMENT      0
-- CREATE SEQUENCE           0
-- CREATE MATERIALIZED VIEW      0
-- CREATE MATERIALIZED VIEW LOG    0
-- CREATE SYNONYM             0
-- CREATE TABLESPACE          0

```

```

-- CREATE USER          0
--
-- DROP TABLESPACE      0
-- DROP DATABASE        0
--
-- REDACTION POLICY    0
--
-- ORDS DROP SCHEMA     0
-- ORDS ENABLE SCHEMA   0
-- ORDS ENABLE OBJECT    0
-- ERRORS               0
-- WARNINGS              0

```

7. TABLES:

TABLE_NAME
JBVR_ACMODEL
JBVR_AGENT
JBVR_AIRLINES
JBVR_AIRPORT
JBVR_AM
JBVR_AP_FLIGHT
JBVR_BOOKING
JBVR_CABIN
JBVR_CUSTOMER
JBVR_FLIGHT
JBVR_INS_PLAN
JBVR_INV
JBVR_ITENARY
JBVR_MEALPLAN
JBVR_MEMBER
JBVR_PASSENGER
JBVR_PAYMENT
JBVR_SPCLREQUEST

```

1 | SELECT TABLE_NAME
2 | FROM USER_TABLES
3 | WHERE TABLE_NAME LIKE 'JBVR%';
4 |

```

TABLE_NAME
JBVR_ACMODEL
JBVR_AGENT
JBVR_AIRLINES
JBVR_AIRPORT
JBVR_AM
JBVR_AP_FLIGHT
JBVR_BOOKING
JBVR_CABIN
JBVR_CUSTOMER
JBVR_FLIGHT
JBVR_INS_PLAN
JBVR_INV
JBVR_ITENARY
JBVR_MEALPLAN
JBVR_MEMBER
JBVR_PASSENGER
JBVR_PAYMENT
JBVR_SPCLREQUEST

[Download CSV](#)

18 rows selected.

- JBVR_CUSTOMER

COUNT(*)
15

- JBVR_INS_PLAN

COUNT(*)
18

- JBVR_PASSENGER

COUNT(*)
17

- JBVR_MEMBER

COUNT(*)
2

- JBVR_MP

COUNT(*)
20

- JBVR_CABIN

COUNT(*)
9

- JBVR_SPCLREQUEST

COUNT(*)
19

- JBVR_AIRPORT

COUNT(*)
20

COUNT(*)
20

- JBVR_AIRLINES

COUNT(*)
19

- JBVR_ACMODEL

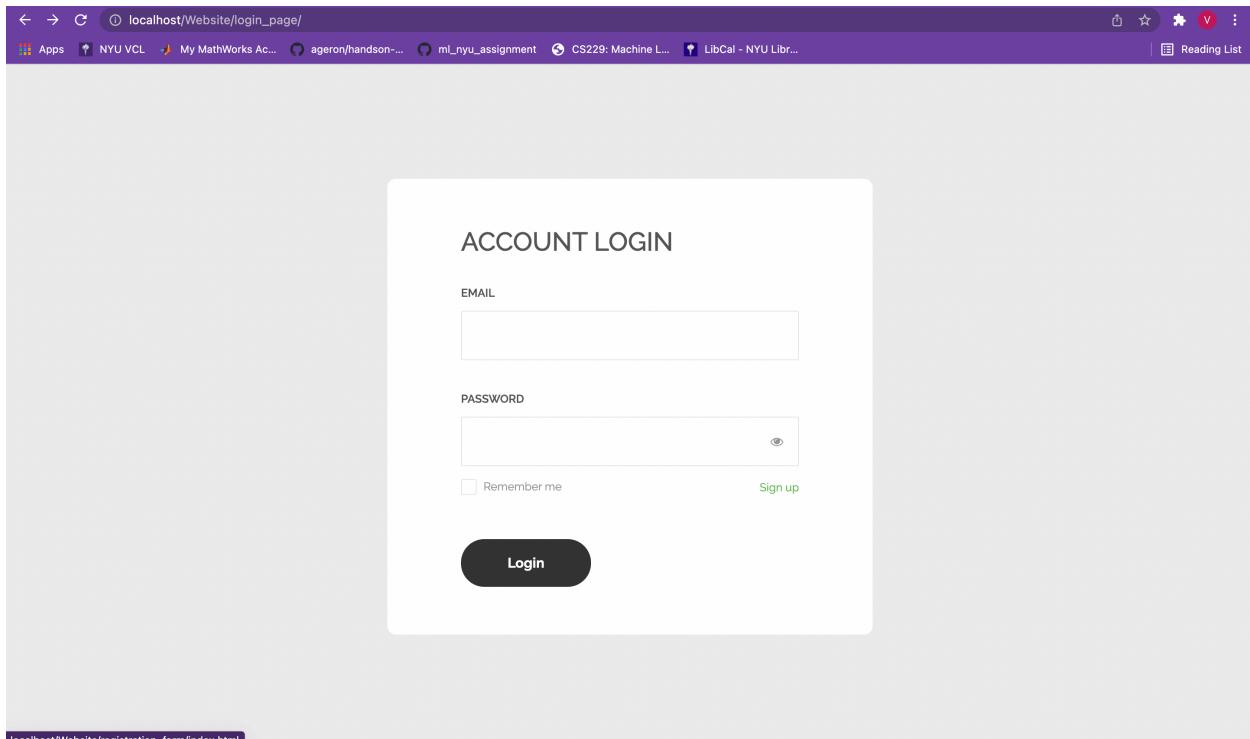
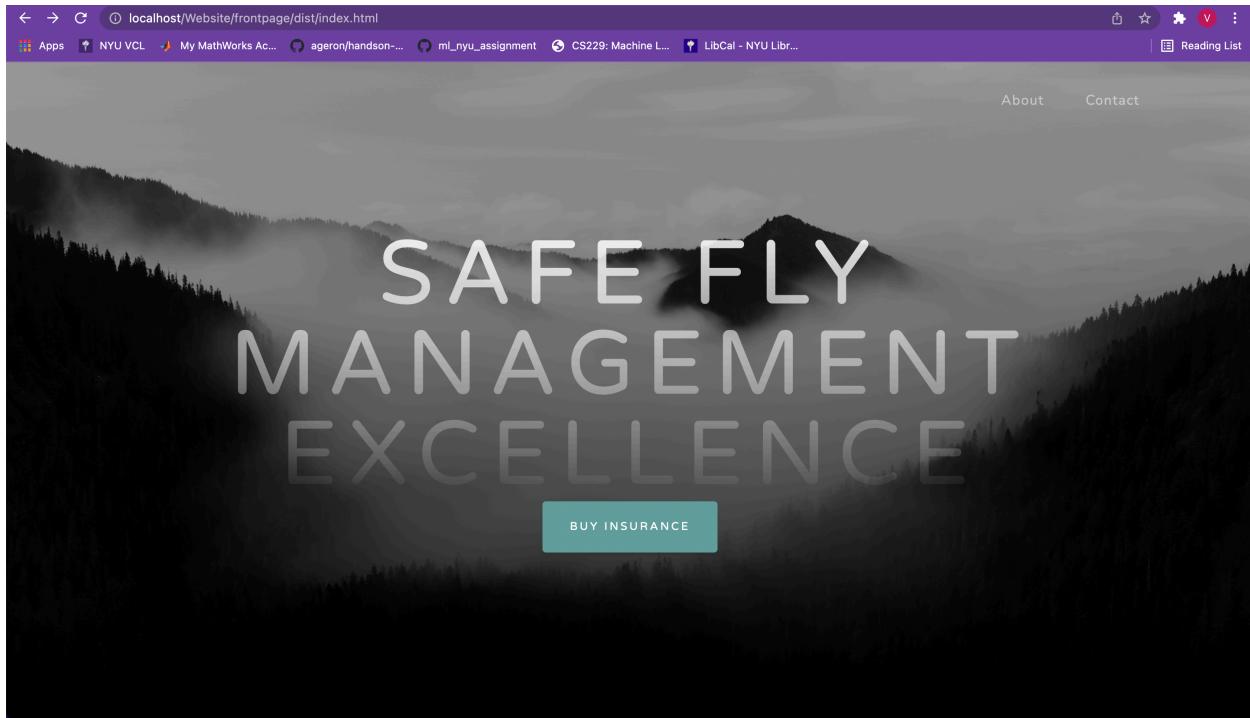
COUNT(*)
10

- JBVR_FLIGHT

COUNT(*)
9

- JBVR_ITENARY

8. SCREENSHOTS:



localhost/Website/registration_form/index.html

Apps NYU VCL My MathWorks Ac... ageron/handson-... ml_nyu_assignment CS229: Machine L... LibCal - NYU Libr... Reading List

Enter your details here

Customer Type/ID#	1
Street	99
City	New York
ZIP Code	11209
State	New York
Country	USA
Email	demo@nyu.edu
Country Code	1
Number	9876543
Gender(M/F)	M
Nationality	American
EC First Name	demo
EC Middle Name	
EC Last Name	demo
EC Country Code	1
EC Contact Number	4567890
Password	***

localhost/Website/login_page/

Apps NYU VCL My MathWorks Ac... ageron/handson-... ml_nyu_assignment CS229: Machine L... LibCal - NYU Libr... Reading List

ACCOUNT LOGIN

EMAIL

PASSWORD



Booking Details

+ Add New Booking

No records were found.

BOOKING DATE
12/18/2021

Arrival Airport
JFK

Arrival Date
12/30/2021

Departure Airport
DOH

Departure Date
12/29/2021

Next



localhost/Website/Passenger_details/index.html

Enter Passenger Details Here

Passenger Type(1 or 2)	1
First name	John
Middle Name	
Last Name	Smith
Date of Birth	01/01/2000
Nationality	American
Gender(F/M/O)	O
Passport Number	U12345
Passport Expiry Date	02/28/2023
Meal Plan	Veg
Cabin class	Economy
Special Request	Medical Assistance
Insurance Type	Healthcare

Add

Passenger Details

+ Add New Passenger

Proceed to payment

Sl No	Passenger Name	Arrival Airport	Departure Airport	Insurance Plan	Insurance Cost	
1	JB	JFK	DOH	All Inclusive	150	

Enter Passenger Details Here

Passenger Type(1 or 2)

First name

Middle Name

Last Name

Date of Birth

Nationality

Gender(F/M/O)

Passport Number

Passport Expiry Date

Meal Plan

Cabin class

Special Request

Insurance Type

localhost/Website/Payment_details/

Apps NYU VCL My MathWorks Ac... ageron/handson-... ml_nyu_assignment CS229: Machine L... LibCal - NYU Lib... Reading List

Enter payment Details:

Card Type: Master Card

Card Number: 12345678987654

Name on card: JB VR

Expiry Date: 12/31/2021

Make Payment

localhost/Website/Invoice_details/invoice_list.php

Apps NYU VCL My MathWorks Ac... ageron/handson-... ml_nyu_assignment CS229: Machine L... LibCal - NYU Lib... Reading List

Invoice

Invoice No.	Date Created	Customer Email	Invoice Amount	Print
27	18/Dec/2021, 00:00:00	demo@nyu.edu	200	

The screenshot shows a web browser window with the URL `localhost/Website/invoice_details/print_invoice.php?invoice_id=27`. The page title is `print_invoice.php`. The content is an invoice titled "Invoice". It includes the recipient information: "To, RECEIVER (BILL TO) Email : demo@nyu.edu". The invoice number is "Invoice No. : 27" and the date is "Invoice Date : 18/Dec/2021, 00:00:00". Below this is a table with columns: Sr No., First Name, Last Name, Arrival Airport, Departure Airport, Insurance Name, and Insurance Cost. The table has two rows:

Sr No.	First Name	Last Name	Arrival Airport	Departure Airport	Insurance Name	Insurance Cost
1	JB	VR	JFK	DOH	All Inclusive	150
2	VR	JB	JFK	DOH	Trip Cancellation	50

Amount: 200

Already existing customer:

The screenshot shows a web browser window with the URL `localhost/Website/login_page/`. The page title is "ACCOUNT LOGIN". It features a form with fields for "EMAIL" containing "u1@gmail.com" and "PASSWORD" containing three dots (...). There is a "Remember me" checkbox and a "Sign up" link. A "Login" button is at the bottom.

localhost/Website/login_page/

Apps NYU VCL My MathWorks Ac... ageron/handson-... ml_nyu_assignment CS229: Machine L... LibCal - NYU Libr... Reading List

ACCOUNT LOGIN

EMAIL

PASSWORD

Remember me [Sign up](#)

Login

Booking Details

+ Add New Booking

SI No	Booking ID	Booking Date	Arrival Airport	Departure Airport
1	16	2021-12-22	newark	doha

MANAGER SIDE:

Select jbvr bookingdetails to change					
Action: <input type="button" value="-----"/> <input type="button" value="Go"/> 0 of 18 selected					
BOOKINGID	BOOKINGDATE	ARRAIRPORT	ARRTIME	DEPAIRPORT	DEPTIME
18	Dec. 18, 2021	JFK	Dec. 30, 2021, midnight	DOH	Dec. 29, 2021, midnight
17	Dec. 23, 2021	newark	Dec. 16, 2021, midnight	doha	Dec. 8, 2021, midnight
16	Dec. 22, 2021	newark	Dec. 17, 2021, midnight	doha	Dec. 22, 2021, midnight
15	Dec. 14, 2021	chennai	Dec. 23, 2021, midnight	bangalore	Dec. 22, 2021, midnight
14	Dec. 15, 2021	chennai	Dec. 14, 2021, midnight	bangalore	Dec. 24, 2021, midnight
13	Dec. 21, 2021	newark	Dec. 15, 2021, midnight	doh	Dec. 16, 2021, midnight
12	Dec. 27, 2021	newark	Dec. 22, 2021, midnight	bangalore	Dec. 22, 2021, midnight
11	Dec. 1, 2021	chennai	Dec. 17, 2021, midnight	doha	Dec. 15, 2021, midnight
10	Dec. 16, 2021	jfk	Dec. 15, 2021, midnight	doh	Dec. 14, 2021, midnight
9	Dec. 7, 2021	jfk	Dec. 9, 2021, midnight	newark	Dec. 2, 2021, midnight
8	Dec. 7, 2021	newark	Dec. 14, 2021, midnight	doh	Dec. 26, 2021, midnight
7	Dec. 15, 2021	<?php echo "hello"/>	Dec. 8, 2021, midnight	doh	Dec. 21, 2021, midnight
6	Dec. 15, 2021	newark	Dec. 8, 2021, midnight	doh	Dec. 21, 2021, midnight
5	Dec. 3, 2021	newark	Dec. 8, 2021, midnight	doha	Dec. 14, 2021, midnight
4	Dec. 23, 2021	chennai	Dec. 21, 2021, midnight	bangalore	Dec. 14, 2021, midnight
3	Dec. 15, 2021	jfk	Dec. 15, 2021, midnight	bangalore	Dec. 15, 2021, midnight
2	Dec. 8, 2021	jfk	Dec. 22, 2021, midnight	bangalore	Dec. 22, 2021, midnight
1	Dec. 6, 2021	jfk	Dec. 10, 2021, midnight	newark	Dec. 21, 2021, midnight

18 jbvr bookingdetailss

WELCOME, ADMIN [VIEW SITE / CHANGE PASSWORD / LOG OUT](#)

[ADD JBVR BOOKINGDETAILS](#) +

WELCOME, ADMIN [VIEW SITE](#) / [CHANGE PASSWORD](#) / [LOG OUT](#)

Select jbvr passenger to change

Search

Action: 0 of 24 selected

<input type="checkbox"/>	PID	PFNAME	PLNAME	DOB	PASSPORTNO
<input type="checkbox"/>	36	VR	JB	Dec. 31, 2000	U54321
<input type="checkbox"/>	35	JB	VR	Jan. 1, 2000	U12345
<input type="checkbox"/>	32	niharika	Rajput	Dec. 23, 2021	W1233
<input type="checkbox"/>	31	atriya	Rajput	Dec. 16, 2021	U675
<input type="checkbox"/>	30	Neha	Reddy	Dec. 22, 2021	y687
<input type="checkbox"/>	29	Monisha	Gnana	Dec. 16, 2021	U7876
<input type="checkbox"/>	28	Jasmine	Batra	Dec. 9, 2021	U877
<input type="checkbox"/>	27	Jasmine	BATRA	Dec. 16, 2021	U685
<input type="checkbox"/>	26	KJHG	Rajput	Dec. 21, 2021	U685
<input type="checkbox"/>	25	AYUSH	Rajput	Dec. 15, 2021	1233
<input type="checkbox"/>	24	Vaishnavi	Rajput	Dec. 29, 2021	U876
<input type="checkbox"/>	23	Jasmine	Batra	Dec. 16, 2021	U876
<input type="checkbox"/>	20	Vaishnavi	Rajput	Dec. 8, 2021	U685
<input type="checkbox"/>	18	kiran	batra	Oct. 28, 2021	U685
<input type="checkbox"/>	17	Meeshu	Rajput	Dec. 7, 2021	U685
<input type="checkbox"/>	14	Suresh	Rajput	Dec. 14, 2021	U675
<input type="checkbox"/>	13	<?php "hello"/>	Rajput	Dec. 19, 2021	W1233
<input type="checkbox"/>	12	jojo	jnki	Dec. 6, 2021	W1233
<input type="checkbox"/>	11	Vaishnavi	Rajput	Dec. 13, 2021	W1233
<input type="checkbox"/>	10	shaliza	dubey	Dec. 13, 2021	1233
<input type="checkbox"/>	6	uijwal	Rajput	Dec. 13, 2021	W1233
<input type="checkbox"/>	5	Vaishnavi	Rajput	Dec. 15, 2021	W1233
<input type="checkbox"/>	4	Vaishnavi	Rajput	Dec. 7, 2021	dsad
<input type="checkbox"/>	1	Ujjwal	djbaskd	Dec. 7, 2021	213das

24 jbvr passengers

[ADD JBVR PASSENGER](#) +

WELCOME, ADMIN [VIEW SITE](#) / [CHANGE PASSWORD](#) / [LOG OUT](#)

Select jbvr passenger to change

Search 1 result (24 total)

Action: 0 of 1 selected

<input type="checkbox"/>	PID	PFNAME	PLNAME	DOB	PASSPORTNO
<input type="checkbox"/>	35	JB	VR	Jan. 1, 2000	U12345

1 jbvr passenger

[ADD JBVR PASSENGER](#) +

Select jbvr passenger to change

[ADD JBVR PASSENGER +](#)

<input type="checkbox"/>	PID	PFNAME	PLNAME	DOB
Action: <input checked="" type="checkbox"/> Delete selected jbvr passengers Go 0 of 1 selected				
<input type="checkbox"/>	35	JB	VR	Jan. 1, 2000
1 jbvr passenger				

Successfully deleted 1 jbvr passenger.

Select jbvr passenger to change

[ADD JBVR PASSENGER +](#)

0 results (23 total)

Action: 0 of 0 selected

0 jbvr passengers

passenger

Add jbvr passenger

Ptype:

Pfname:

Pmname:

Plname:

Dob: Today |
Note: You are 5 hours behind server time.

Pnationality:

Pgender:

Passportno:

Ppexpdate: Today |
Note: You are 5 hours behind server time.

Mealplan:

Specialreq:

Cabinclass:

Bookingid: -----

Insid: -----

[Save and add another](#)[Save and continue editing](#)[SAVE](#)

9. SECURITY FEATURE:

- 1) **PASSWORD:** The password is encrypted at backend. Our backend script is generating a hashed password using a hash function in php.
- 2) **Form Validation:** All the forms will be validated, and user won't be able to enter the data if in the wrong input format.
- 3) **SQL Injection and Cross Site Scripting:** We have used function mysqli_real_escape_string that will not allow malicious SQL to be inserted and thus prevent injection. Along with we have used htmlspecialchars for prevention of Cross Site Scripting.

10. BUSINESS ANALYSIS WITH ORACLE LIVE SQL

1) TABLE JOINS WITH AT LEAST 3 TABLES IN JOIN

SQL Worksheet

```
1 SELECT P.PFNAME AS "PASSENGER NAME", M.MEALNAME AS "MEAL PLAN", I.PNR AS "PNR ID"
2 FROM JBVR_ITENARY I JOIN JBVR_PASSENGER P ON I.PID=P.PID
3 JOIN JBVR_MEALPLAN M ON
4 M.MEALCODE=I.MEALCODE;
```

PASSENGER NAME	MEAL PLAN	PNR ID
STEVE	VEG	12
SACHIN	NON VEG	11
VAISHNAVI	VEG	13
JASMINE	NON VEG	14
SHRAVYA	FRUITS	15
MNISHA	VEG	16
KATHI	NON VEG	17
STEEFE	FRUITS	18
NEEL	NON VEG	19

[Download CSV](#)
9 rows selected.

This query will allow us to gather passenger name along with their meal plan and their respective PNR ID.

2) MULTIROW SUBQUERY

```
1 SELECT * FROM JBVR_INV
2 WHERE IPID IN (SELECT IPID FROM JBVR_INS_PLAN
3 WHERE IPCOST =50);
```

INVID	INVDATE	INVAMOUNT	IPID
1	08-DEC-85	150	1

[Download CSV](#)

This query provides invoice details that has insurance plan costing 50.

3) CORRELATED SUBQUERY

```
1 select CID AS "Customer ID", CTYPE AS "Customer Type", PSS_CNT AS "Number of Passengers"
2 from JBVR_CUSTOMER A
3 where PSS_CNT > (select AVG(PSS_CNT)
4 from JBVR_CUSTOMER where CTYPE = A.CTYPE)
5 order by CID;
6
```

Customer ID	Customer Type	Number of Passengers
22	D	6
25	D	7
26	D	9
30	D	7

[Download CSV](#)
4 rows selected.

This query uses the concept of correlated subquery in which the parent query is dependent on the result of subquery for each row.

4) SET OPERATOR

```
1 SELECT CEMAIL from JBVR_CUSTOMER
2 WHERE PSS_CNT=2
3 UNION
4 SELECT CEMAIL FROM JBVR_CUSTOMER WHERE CTYPE='D';
```

CEMAIL
ALIA@GMAIL.COM
DIVESH@GMAIL.COM
ISHRAT@GMAIL.COM
JAS@GMAIL.COM
NEEL@GMAIL.COM
NEHA@GMAIL.COM
SACHIN@GMAIL.COM
VIJAY@GMAIL.COM
X@GMAIL.COM

[Download CSV](#)

This query returns email id of customer who has passenger count 2 and they are direct type of customer.

5) QUERY WITH IN LINE VIEW OR WITH CLAUSE

```

1 WITH SPECIALASSISTANCE AS
2 (SELECT A.F_ID AS "FLIGHT ID", A.FNUMBER AS "FLIGHT NUMBER", C.REQUEST AS "SPECIAL REQUEST"
3 FROM JBVR_FLIGHT A JOIN JBVR_ITENARY B ON A.F_ID = B.F_ID JOIN JBVR_SPCLREQUEST C ON B.REQID
4 = C.REQID)
5 SELECT "FLIGHT ID","FLIGHT NUMBER" FROM SPECIALASSISTANCE WHERE "SPECIAL REQUEST" = 'ELDERLY PASSENGER';

```

FLIGHT ID	FLIGHT NUMBER
62	284
64	294
65	234
66	234
67	208
61	234

Download CSV
6 rows selected.

This query provides information about Flight Id and Flight Number

6) TOP-N query

SQL Worksheet

```

1 WITH AMOUNT AS
2 (SELECT A.IPNAME AS "INSURANCE PLAN NAME", SUM(D.INVAMOUNT) AS "TOTAL INVOICE AMOUNT" FROM JBVR_INV D
3 JOIN JBVR_INS_PLAN A ON A.IPID = D.IPID GROUP BY a.IPNAME)
4 SELECT * FROM AMOUNT
5 ORDER BY "TOTAL INVOICE AMOUNT" DESC
6 OFFSET 0 ROWS FETCH NEXT 3 ROWS ONLY;

```

INSURANCE PLAN NAME	TOTAL INVOICE AMOUNT
TICKET CANCELLATION	650
BAGGAGE ALLOWANCE	550
MEDICAL ASSISTANCE	150

Download CSV
3 rows selected.

This query provides details of insurance plan which have highest invoice amount.

11. LESSONS LEARNED

As I reflect on this semester's Database Management Systems class and the major project, I believe I have learnt a great deal that will benefit me significantly in the future. This has been one of the most enjoyable classes I've ever had. Prof. Amit Patel's and all of the TAs' efforts have made this learning possible and are greatly appreciated. The project has aided each of us in this class in understanding database design ideas and how to apply that knowledge to solve real-world business problems.

However, every learning experience has a period of ups and downs, and this one was no exception. The time period divide for both portions could have been better, in my opinion. While the time allotted for project part 1 was far greater than what was required, the time allotted for project part 2 felt much shorter. Part 1's database architecture, while difficult and requiring numerous revisions, could have been accomplished in 10 days, with data population

taking only 5 days extra. However, when it came to the second portion of the project, many of us had little to no experience with frontend and backend programming, which are both difficult to master and apply in such a short period of time. When you consider how busy most of us are with classes, assignments, quizzes, labs, and examinations, and how some of us also have an on-campus job, the time required to learn and implement project part 2 was substantially larger than the time available.

Even after learning PHP, HTML, CSS, and JS, creating a web application for a complicated database like this one proved to be far more difficult than anticipated. However, it was an excellent learning experience in which we learned not just the subject's ideas but also time management, teamwork, and functioning under duress. I'd want to express my gratitude to all of the TAs and professors for a fantastic class and learning experience.