

Regal Airways Reservation System

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Abstract—This project is an airline website with fully functional reservation system. Users are allowed to create accounts to reserve flights and view/cancel their reservations. Employees are allowed to add new aircrafts, flights and airports as well as request reports by airport and flight.

1 Introduction

THE following project is a web-developed airline reservation system for Regal Airways written in HTML, CSS, JavaScript, PHP, and MySQL. Regal Airways is an international airline company, with flights operating in several hundred countries and serving billions of customers each year. The airline company has several types of aircrafts, each with with different capacity, mileage, routing range, different travel classes (like economy class, premium economy class business class, first class, family class), different types of services (like WiFi, battery charger and include some more services of your choice) and price. Being an international company, it has several branches all over the world, offering domestic as well as international flights. It also offers several discount schemes for its member customers, for children and people with disabilities. Furthermore, different aircraft will have different number of crew members (like air hostess, pilots, security personnel especially for international flights). Due to the quality of services offered by the airlines has received number of prestigious awards in the past. The interface is a multi-page website complete with user authentication for employees and customers. Users are displayed a welcome page after signing in and are given one of two possible navigation menus dependent on their account type (employee or customer).

2 Platforms/Requirements

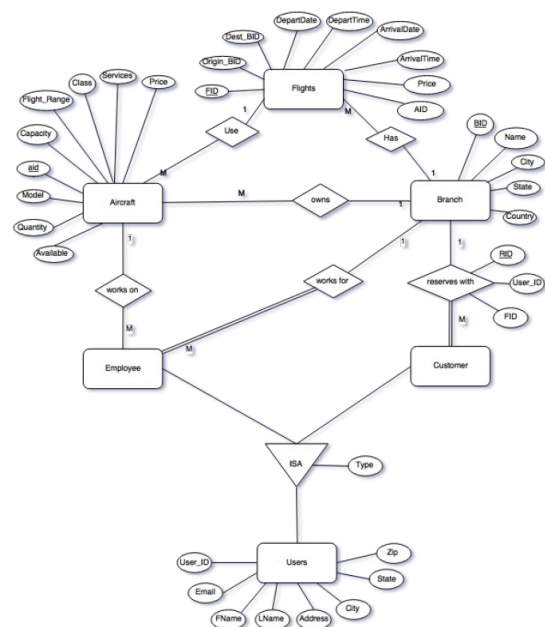
The website's source is hosted on a Cloud9 workspace and uses a MySQL database connection through PHPMyAdmin. Running the appli-

cation needs to begin with the index.php file. Accounts can be created autonomously by the user that defaults to a customer account but converting the account to allow employee access is a change that must be made in the **USERS** table on PHPMyAdmin.

3 Assumptions

- 1) Assume that users requesting employee access are granted it via another employee.
- 2) Assume that customers reach their final destinations by reserving one or more flights.

4 Entity Relation Diagram



5 Relational Schema

```

AIRCRAFT(AID, Model, Capacity, Mileage,
    → Flight_Range, Class, Services,
    → Price, Quantity, Available)
BRANCH(BID, Name, City, State, Country)
RESERVE(RID, USER_ID, FID)
FLIGHT(FID, ORIGIN_BID, DEST_BID,
    → DepartDate, DepartTime,
    → ArrivalDate, ArrivalTime, Price,
    → AID)
USERS(USER_ID, Email, Password, fname,
    → lname, Address, City, State, Zip,
    → Type)

```

SQL DDL:

```

CREATE TABLE IF NOT EXISTS 'AIRCRAFT' (
    'AID' int(10) unsigned NOT NULL
        → AUTO_INCREMENT,
    'MODEL' varchar(20) NOT NULL,
    'CAPACITY' int(4) NOT NULL,
    'MILEAGE' int(6) NOT NULL,
    'FLIGHT_RANGE' int(6) NOT NULL,
    'CLASS' int(1) NOT NULL,
    'SERVICES' int(11) NOT NULL,
    'PRICE' int(11) NOT NULL,
    'QUANTITY' int(5) NOT NULL,
    'AVAILABLE' int(5) NOT NULL,
    PRIMARY KEY ('AID')
)
CREATE TABLE IF NOT EXISTS 'BRANCH' (
    'BID' int(10) NOT NULL AUTO_INCREMENT,
    'NAME' varchar(80) NOT NULL,
    'CITY' varchar(30) NOT NULL,
    'STATE' char(2) DEFAULT NULL,
    'COUNTRY' varchar(30) NOT NULL,
    PRIMARY KEY ('BID')
)
CREATE TABLE IF NOT EXISTS 'RESERVE' (
    'RID' int(10) NOT NULL AUTO_INCREMENT,
    'USER_ID' int(10) NOT NULL,
    'FID' int(10) NOT NULL,
    PRIMARY KEY ('RID')
)
CREATE TABLE IF NOT EXISTS 'FLIGHT' (
    'FID' int(11) NOT NULL AUTO_INCREMENT,
    'ORIGIN_BID' int(10) NOT NULL,
    'DEST_BID' int(10) NOT NULL,
    'DEPARTDATE' date NOT NULL,

```

```

    'DEPARTTIME' time NOT NULL,
    'ARRIVALDATE' date NOT NULL,
    'ARRIVALTIME' time NOT NULL,
    'PRICE' int(32) NOT NULL,
    'AID' int(11) NOT NULL,
    PRIMARY KEY ('FID')
)
CREATE TABLE IF NOT EXISTS 'USERS' (
    'USER_ID' int(11) NOT NULL
        → AUTO_INCREMENT,
    'EMAIL' varchar(1024) NOT NULL,
    'PASSWORD' varchar(255) NOT NULL,
    'FNAME' varchar(30) NOT NULL,
    'LNAME' varchar(30) NOT NULL,
    'ADDRESS' varchar(30) NOT NULL,
    'CITY' varchar(30) NOT NULL,
    'STATE' char(2) NOT NULL,
    'ZIP' int(5) NOT NULL,
    'TYPE' int(1) NOT NULL DEFAULT '0',
    PRIMARY KEY ('USER_ID')
)

```

6 Description of the Code

The website's source is separated into numerous PHP files that are initiated as a result of different form actions. Each function has its own PHP file. For example, flight reservation is contained in its own PHP file along with a `push` file that manipulates user input to the database. CSS and JavaScript are included in separate folders.

7 Conclusion

Collaboration on a web development project was convenient and simplified thanks to using Cloud9 as a group. This project was extremely beneficial to gaining a real-world understanding of how PHP interacts with MySQL databases. One of the biggest lessons was seeing how the system can filter through more than one table in the database to return information back to the user.

8 Future Work

The website can be enhanced to push email notifications about the user's reservations to any address. Providing a PDF-viewable flight ticket is another improvement for the website.

References

- [1] [Online]. Available: <https://c9.io>
 [2] [Online]. Available: <https://www.w3schools.com/>

Appendix

The following code formatted in bold will create the database tables and populate them with sample data.

```
-- phpMyAdmin SQL Dump
-- version 4.0.10deb1
-- http://www.phpmyadmin.net
--
-- Host: 127.0.0.1
-- Generation Time: Dec 01, 2017 at
--    05:05 PM
-- Server version: 5.5.57-0ubuntu0
--    .14.04.1
-- PHP Version: 5.5.9-1ubuntu4.22

SET SQL_MODE = "NO_AUTO_VALUE_ON_ZERO";
SET time_zone = "+00:00";

/*!40101 SET @OLD_CHARACTER_SET_CLIENT=
    @@CHARACTER_SET_CLIENT */;
/*!40101 SET @OLD_CHARACTER_SET_RESULTS=
    @@CHARACTER_SET_RESULTS */;
/*!40101 SET @OLD_COLLATION_CONNECTION=
    @@COLLATION_CONNECTION */;
/*!40101 SET NAMES utf8 */;

--
-- Database: 'c9'
--
-----

--
-- Table structure for table 'AIRCRAFT'
--

CREATE TABLE IF NOT EXISTS 'AIRCRAFT' (
    'AID' int(10) unsigned NOT NULL
        AUTO_INCREMENT,
    'MODEL' varchar(20) NOT NULL,
    'CAPACITY' int(4) NOT NULL,
    'MILEAGE' int(6) NOT NULL,
    'FLIGHT_RANGE' int(6) NOT NULL,
```

```
'CLASS' int(1) NOT NULL,
'SERVICES' int(11) NOT NULL,
'PRICE' int(11) NOT NULL,
'QUANTITY' int(5) NOT NULL,
'AVAILABLE' int(5) NOT NULL,
PRIMARY KEY ('AID')
) ENGINE=InnoDB DEFAULT CHARSET=utf8
    AUTO_INCREMENT=2 ;

--
-- Dumping data for table 'AIRCRAFT'
--

INSERT INTO 'AIRCRAFT' ('AID', 'MODEL',
    'CAPACITY', 'MILEAGE', '
    FLIGHT_RANGE', 'CLASS', 'SERVICES
    ', 'PRICE', 'QUANTITY', 'AVAILABLE
    ') VALUES
(1, 'Boeing_747-8', 467, 8000, 8000, 3,
    1, 10000, 8, 4);

-----

--
-- Table structure for table 'BRANCH'
--

CREATE TABLE IF NOT EXISTS 'BRANCH' (
    'BID' int(10) NOT NULL AUTO_INCREMENT,
    'NAME' varchar(80) NOT NULL,
    'CITY' varchar(30) NOT NULL,
    'STATE' char(2) DEFAULT NULL,
    'COUNTRY' varchar(30) NOT NULL,
    PRIMARY KEY ('BID')
) ENGINE=InnoDB DEFAULT CHARSET=utf8
    AUTO_INCREMENT=12 ;

--
-- Dumping data for table 'BRANCH'
--

INSERT INTO 'BRANCH' ('BID', 'NAME', '
    CITY', 'STATE', 'COUNTRY') VALUES
(1, 'Detroit_Metro_Wayne', 'Detroit', '
    MI', 'USA'),
(3, 'Test', 'Rochester', 'MI', 'USA'),
(4, 'Willow_Run_Airport', 'Ypsilanti', '
    MI', 'USA'),
(5, 'Bishop_International_Airport', '
    ')
```

```

    ↪ Flint', 'MI', 'USA'),
(6, 'Heathrow_Airport', 'Longford', '',
    ↪ 'UK'),
(7, 'Oakland_Airport', 'Rochester', 'MI'
    ↪ , 'USA'),
(8, 'Los_Angeles_Airport', 'Los_Angeles'
    ↪ , 'CA', 'USA'),
(9, 'Daytona_Beach_International_Airport'
    ↪ , 'Daytona_Beach', 'FL', 'USA'),
(10, 'Denver_International_Airport', '
    ↪ Denver', 'CO', 'USA'),
(11, 'Chicago_0'Hare_International_
    ↪ Airport', 'Chicago', 'IL', 'USA');

```

```

-- -----
--
-- Table structure for table 'FLIGHT'
--

```

```

CREATE TABLE IF NOT EXISTS 'FLIGHT' (
  'FID' int(11) NOT NULL AUTO_INCREMENT,
  'ORIGIN_BID' int(10) NOT NULL,
  'DEST_BID' int(10) NOT NULL,
  'DEPARTDATE' date NOT NULL,
  'DEPARTTIME' time NOT NULL,
  'ARRIVALDATE' date NOT NULL,
  'ARRIVALTIME' time NOT NULL,
  'PRICE' int(32) NOT NULL,
  'AID' int(11) NOT NULL,
  PRIMARY KEY ('FID')
) ENGINE=InnoDB DEFAULT CHARSET=utf8
  ↪ AUTO_INCREMENT=60 ;

```

```

--
-- Dumping data for table 'FLIGHT'
--

```

```

INSERT INTO 'FLIGHT' ('FID', 'ORIGIN_BID'
    ↪ , 'DEST_BID', 'DEPARTDATE', '
    ↪ DEPARTTIME', 'ARRIVALDATE', '
    ↪ ARRIVALTIME', 'PRICE', 'AID')
    ↪ VALUES
(56, 11, 1, '2017-12-01', '09:30:00', '
    ↪ 2017-12-01', '11:00:00', 80, 1),
(57, 1, 11, '2017-12-02', '11:00:00', '
    ↪ 2017-12-02', '13:30:00', 95, 1),
(58, 1, 10, '2017-12-01', '14:30:00', '
    ↪ 2017-12-01', '17:30:00', 210, 1),

```

```

(59, 8, 10, '2017-12-02', '08:00:00', '
    ↪ 2017-12-02', '09:45:00', 140, 1);

```

```

-- -----
--
-- Table structure for table 'RESERVE'
--

```

```

CREATE TABLE IF NOT EXISTS 'RESERVE' (
  'RID' int(10) NOT NULL AUTO_INCREMENT,
  'USER_ID' int(10) NOT NULL,
  'FID' int(10) NOT NULL,
  PRIMARY KEY ('RID')
) ENGINE=InnoDB DEFAULT CHARSET=utf8
  ↪ AUTO_INCREMENT=21 ;

```

```

--
-- Dumping data for table 'RESERVE'
--

```

```

INSERT INTO 'RESERVE' ('RID', 'USER_ID',
    ↪ 'FID') VALUES
(16, 1, 56),
(18, 2, 56),
(19, 2, 56),
(20, 1, 59);

```

```

-- -----
--
-- Table structure for table 'USERS'
--

```

```

CREATE TABLE IF NOT EXISTS 'USERS' (
  'USER_ID' int(11) NOT NULL
    ↪ AUTO_INCREMENT,
  'EMAIL' varchar(1024) NOT NULL,
  'PASSWORD' varchar(255) NOT NULL,
  'FNAME' varchar(30) NOT NULL,
  'LNAME' varchar(30) NOT NULL,
  'ADDRESS' varchar(30) NOT NULL,
  'CITY' varchar(30) NOT NULL,
  'STATE' char(2) NOT NULL,
  'ZIP' int(5) NOT NULL,
  'TYPE' int(1) NOT NULL DEFAULT '0',
  PRIMARY KEY ('USER_ID')
) ENGINE=InnoDB DEFAULT CHARSET=utf8
  ↪ AUTO_INCREMENT=56 ;

```

```
--
-- Dumping data for table 'USERS'
--

INSERT INTO 'USERS' ('USER_ID', 'EMAIL',
    ↪ 'PASSWORD', 'FNAME', 'LNAME', '
    ↪ ADDRESS', 'CITY', 'STATE', 'ZIP',
    ↪ 'TYPE') VALUES
(1, 'adushaj23@oakland.edu', 'root12345'
    ↪ , 'Aleks', 'Dushaj', '1337_Coolguy
    ↪ _Dr', 'Macomb', '', 48042, 1),
(2, 'trwinowiecki@oakland.edu',
    ↪ test12345',_Taylor',_Winowiecki'
    ↪ ,_''',_''',_''',_48017,_1),
(3,_bobsmith@gmail.com',_test12345',_
    ↪ Bob',_Smith',_1234 Oakland Ave',
    ↪ _Rochester',_MI',_55532,_0),
(5,_trw0511@yahoo.com',_test12345',_
    ↪ John',_Smith',_1234 Street',_
    ↪ Clawson',_Mi',_48017,_0),
(10,_bbrothers@gmail.com',_test12345',
    ↪ _Brock',_Brothers',_2314 Kanto
    ↪ Road',_Shelby Twp',_MI',_48310,_
    ↪ 0),
(11,_napolhemus@oakland.edu',_
    ↪ test12345',_Nick',_Polhemus',_
    ↪ Whoa',_Place',_MI',_48313,_1),
(55,_root@regalairways.com',_root',_
    ↪ root',_root',_Null Street',_
    ↪ Null City',_NA',_13337,_1);

/*!40101_SET_CHARACTER_SET_CLIENT=
    ↪ @OLD_CHARACTER_SET_CLIENT*/;
/*!40101_SET_CHARACTER_SET_RESULTS=
    ↪ @OLD_CHARACTER_SET_RESULTS*/;
/*!40101_SET_COLLATION_CONNECTION=
    ↪ @OLD_COLLATION_CONNECTION*/;
```