Final project requirement version 1 (07/01/2022)

We are going to design a flight reservation system for a flight agency. They have an admin that can modify master data, up to 10 employees that search, reserve, and print tickets for customers. And as many as customer that buying a ticket from them. Also, they have a cashier that finalizes tickets after receiving the whole amount of price in the form of cash or bank transfer.

The system contains 3 modules. Flight module, user module, and accounting module.

1. User module:

This module contains the login information, contact information, and activity history information for employees and customers. As this is not an online system, then each customer has a client id but cannot login into the system. However, the rest 12 users (Admin, Employees, Cashier) can login with their user id and password.

Any activity like login, search, issuing a ticket, and logout must be recorded in a log table.

2. Accounting module

A simple accounting system that keeps track of each ticket. When a ticket is issued the price of the ticket must paid in cash or via a bank transfer. When a ticket is issued the first airline of the ticket will be credited for the price of the ticket minus 5% that is the agency commission. The system must provide report regarding the current balance of each customer, the cash register machine, the bank account and finally the business partner airlines.

When a ticket price is paid by the customer, the cashier will change the status of the ticket from reserved to book after receiving money. Each payment is linked to a ticket with a reference number that is the ticket(s) reservation number. Please note a reservation may contain more than one ticket.

Cashier is responsible to enter the incoming balance to Cash desk or the bank account.

3. Flight module

Flight module contains at least the following tables. Countries, Airports, Airlines, Routes, Planes, Schedules, Reservation. These data except the schedule table have been collected from openflights.org. The reservation table must be designed by you and will be filled by the system. The schedule table has a special design that must be filled by some random data. The explanation here regarding the tables collected from the source website.

3.1 Countries table

The country dataset contains a list of ISO 3166-1 country codes, which can be used to look up the human-readable country names for the codes used in the Airline and Airport tables. Each entry contains the following information:

name	Full name of the country or territory.
iso_code	Unique two-letter ISO 3166-1 code for the country or territory.
dafif_code	FIPS country codes as used in DAFIF. Obsolete and primarily of historical interested.

The data is UTF-8 encoded. The special value **\N** is used for "NULL" to indicate that no value is available and is understood automatically by MySQL if imported.

Notes:

- Some entries have DAFIF codes, but not ISO codes. These are primarily uninhabited islands without airports and can be ignored for most purposes.

Sample entries
`"Australia","AU","AS"`
`"Ashmore and Cartier Islands",\N,"AT"`

3.2 Airports table

Each entry contains the following information:

Airport ID	Unique OpenFlights identifier for this airport.
Name	Name of airport. May or may not contain the **City** name.
City	Main city served by airport. May be spelled differently from **Name**.
Country	Country or territory where airport is located. See Countries to cross-reference to ISO 3166-1 codes.
IATA	3-letter IATA code. Null if not assigned/unknown.
ICAO	4-letter ICAO code. Null if not assigned.
Latitude	Decimal degrees, usually to six significant digits. Negative is South, positive is North.
Longitude	Decimal degrees, usually to six significant digits. Negative is West, positive is East.
Altitude	In feet.
Timezone	Hours offset from UTC. Fractional hours are expressed as decimals, eg. India is 5.5.
DST	Daylight savings time. One of E (Europe), A (US/Canada), S (South America), O (Australia), Z (New Zealand), N (None) or U (Unknown). *See also: Help: Time*
Tz database time zone	Timezone in "tz" (Olson) format, eg. "America/Los_Angeles".
Type	Type of the airport. Value "airport" for air terminals, "station" for train stations, "port" for ferry terminals and "unknown" if not known. *In airports.csv, only type=airport is included.*
Source	Source of this data. "OurAirports" for data sourced from OurAirports, "Legacy" for old data not matched to OurAirports (mostly DAFIF), "User" for unverified user contributions. *In airports.csv, only source=OurAirports is included.*

The data is UTF-8 encoded.

Note: Rules for daylight savings time change from year to year and from country to country. The current data is an approximation for 2009, built on a country level. Most airports in DST-less regions in countries that generally observe DST (eg. AL, HI in the USA, NT, QL in Australia, parts of Canada) are marked incorrectly.

Sample entries
`507,"London Heathrow Airport","London","United Kingdom","LHR","EGLL",51.4706, -0.461941,83,0,"E","Europe/London","airport","OurAirports"`
`26,"Kugaaruk Airport","Pelly Bay","Canada","YBB","CYBB",68.534401,-89.808098, 56,-7,"A","America/Edmonton","airport","OurAirports"`
`3127,"Pokhara Airport","Pokhara","Nepal","PKR","VNPK",28.200899124145508, 83.98210144042969,2712,5.75,"N","Asia/Katmandu","airport","OurAirports"`

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8810,"Hamburg Hbf","Hamburg","Germany","ZMB",\N,53.552776,10.006683,30,1,"E",
"Europe/Berlin","station","User"
```

3.3 Airline table

Each entry contains the following information:

Airline ID	Unique OpenFlights identifier for this airline.
Name	Name of the airline.
Alias	Alias of the airline. For example, All Nippon Airways is commonly known as "ANA".
IATA	2-letter IATA code, if available.
ICAO	3-letter ICAO code, if available.
Callsign	Airline callsign.
Country	Country or territory where airport is located. See Countries to cross-reference to ISO 3166-1 codes.
Active	"Y" if the airline is or has until recently been operational, "N" if it is defunct. This field is *not* reliable: in particular, major airlines that stopped flying long ago, but have not had their IATA code reassigned (eg. Ansett/AN), will incorrectly show as "Y".

The data is UTF-8 encoded. The special value **\N** is used for "NULL" to indicate that no value is available and is understood automatically by MySQL if imported.

Notes: Airlines with null codes/callsigns/countries generally represent user-added airlines. Since the data is intended primarily for current flights, defunct IATA codes are generally not included. For example, "Sabena" is not listed with a SN IATA code, since "SN" is presently used by its successor Brussels Airlines.

Sample entries
`324,"All Nippon Airways","ANA All Nippon Airways","NH","ANA","ALL NIPPON","Japan","Y"`
`412,"Aerolineas Argentinas",\N,"AR","ARG","ARGENTINA","Argentina","Y"`
`413,"Arrowhead Airways",\N,"","ARH","ARROWHEAD","United States","N"`

3.4 Routes table

Each entry contains the following information:

Airline	2-letter (IATA) or 3-letter (ICAO) code of the airline.
Airline ID	Unique OpenFlights identifier for airline.
Source airport	3-letter (IATA) or 4-letter (ICAO) code of the source airport.
Source airport ID	Unique OpenFlights identifier for source airport.
Destination airport	3-letter (IATA) or 4-letter (ICAO) code of the destination airport.
Destination airport ID	Unique OpenFlights identifier for destination airport.
Codeshare	"Y" if this flight is a codeshare (that is, not operated by *Airline*, but another carrier), empty otherwise.
Stops	Number of stops on this flight ("0" for direct)
Equipment	letter codes for plane type(s) generally used on this flight, separated by spaces

The data is UTF-8 encoded. The special value **\N** is used for "NULL" to indicate that no value is available and is understood automatically by MySQL if imported.

Notes:

- Routes are directional: if an airline operates services from A to B and from B to A, both A-B and B-A are listed separately.
- Routes where one carrier operates both its own and codeshare flights are listed only once.

Sample entries
BA,1355,SIN,3316,LHR,507,,0,744 777
BA,1355,SIN,3316,MEL,3339,Y,0,744
TOM,5013,ACE,1055,BFS,465,,0,320

3.5 Planes table

Each entry contains the following information:

Name	Full name of the aircraft.
IATA code	Unique three-letter IATA identifier for the aircraft.
ICAO code	Unique four-letter ICAO identifier for the aircraft.
Total Capacity	Total amount of seats.
First Cap.	Number of 1st class seats.
Business Cap.	Number of business class seats.
Prem. Eco Cap.	Number of premium economy class seats.
Economy Cap.	Number of economy class seats.

The data is UTF-8 encoded. The special value **\N** is used for "NULL" to indicate that no value is available and is understood automatically by MySQL if imported.

Notes:

- Aircraft with IATA but without ICAO codes are generally aircraft classes: for example, IATA "747" can be any type of Boeing 747, whereas IATA "744"/ICAO "B744" is specifically a Boeing 747-400.

Sample entries
"Boeing 787","787",\N,159,6,7,17,129
"Boeing 787-10","78J","B78X",193,7,9,21,156
"Boeing 787-8","788","B788",202,8,10,22,162

3.6 Schedules table

The data would contain the following fields per row:

Source airport, destination airport, start date, end date, days of operation (days of week), departure time in GMT, arrival time in GMT, flight number, aircraft type, flight duration

Sample rows:
LCG,MAD,-,2013-07-19,1 2 3 4 5 6,13:25,14:45,IB513,320,01:20
LCG,MAD,2013-07-22,-,1 2 3 4 5,13:25,14:45,IB513,320,01:20
LCG,MAD,2013-07-20,-,6,13:30,14:50,IB513,321,01:20

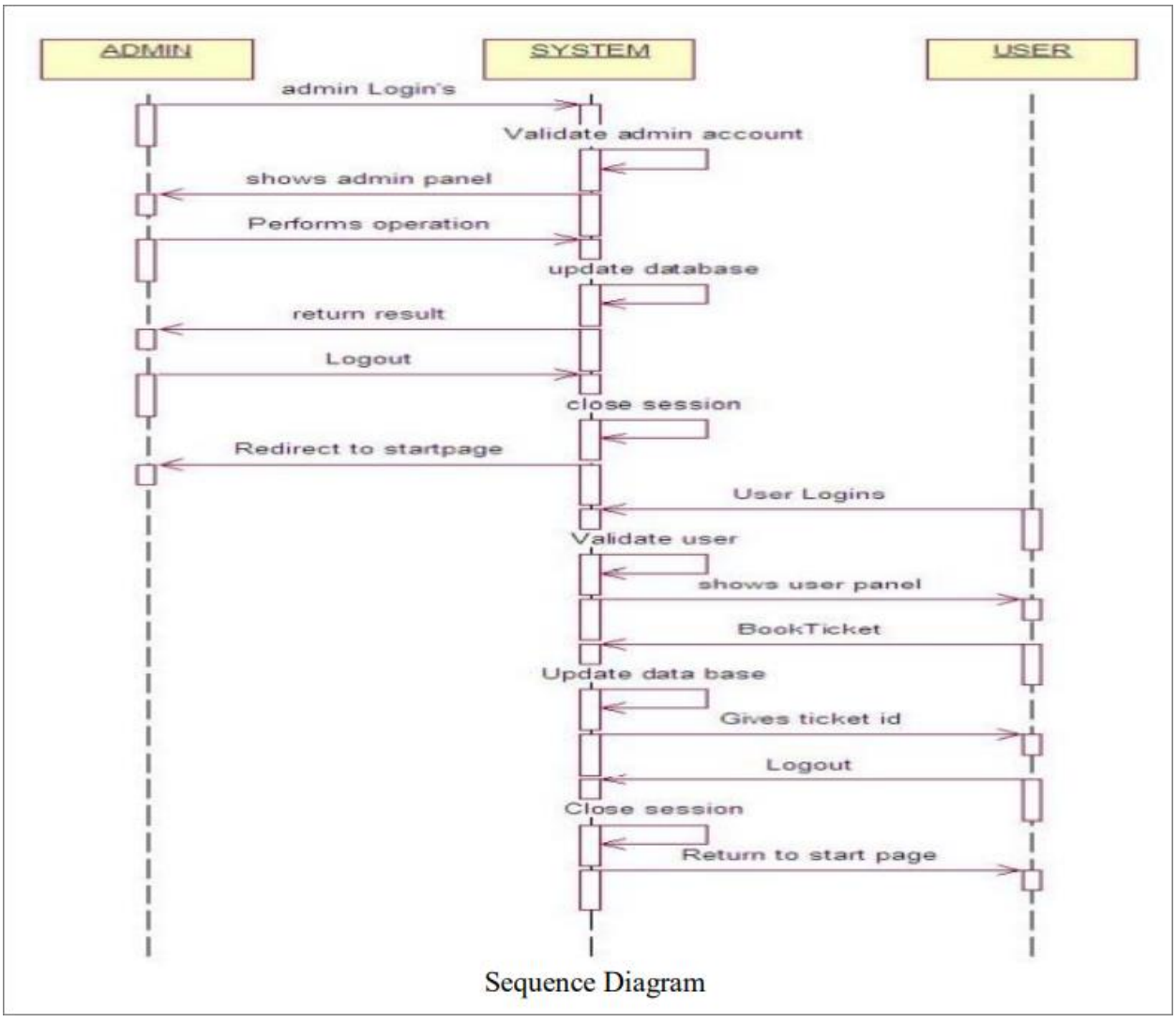
This is an indicative sample, not the final format, you can extend it as you like. You must enter some sample data using some random data generator function.

3.7 Reservation table

You need to design this table based on your own understanding. When an employee searches a flight between A and B, the number of available seats in each class must be provided separately.

Your system can offer possible flights with zero, one or two connection flights as soon as there is 4 hours gap between arrival and departure flights in a connection airport.

A sample sequence diagram[1] can be like this:



Sequence Diagram

[1] https://ijisrt.com/assets/upload/files/IJISRT21JUN223.pdf