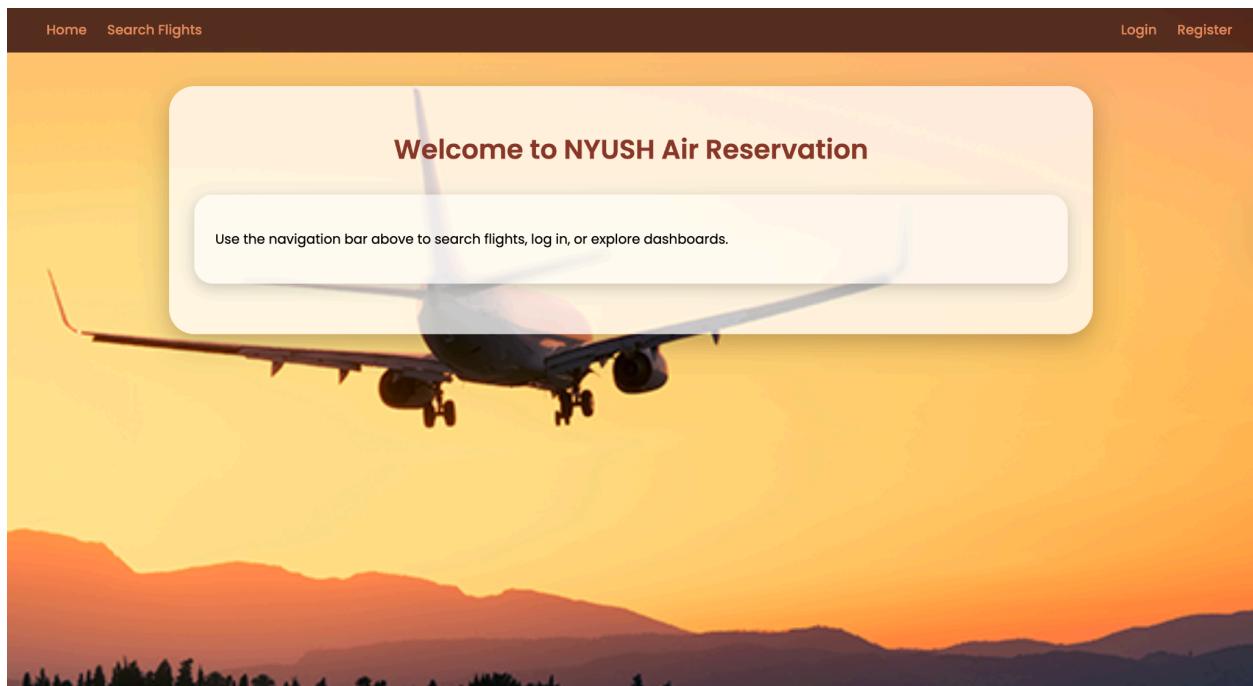


Databases Web Application Project:

“NYUSH Air Reservation”

Amelia Tuttle & Susan Wang | aat936 & sw5571| Dec 2025



File List

Application

<i>app.py</i>	Main Flask application. Defines configuration, database connection helper, login-required decorator, and all routes for: <ul style="list-style-type: none">- public users (home, search, registration, login)- customers (dashboard, flight search, purchase, spending)- booking agents (dashboard, search, purchase on behalf of customers, bookings)- airline staff (dashboard, passengers view, analytics, admin/operator tools)
<i>sql.txt</i>	Text file with all insert queries used to insert sample data.
<i>air_reservation.sql</i>	Creates tables for the database

Templates (/templates)

Shared Layout:

<i>base.html</i>	Global HTML template with navbar, background styling. All other templates extend this file
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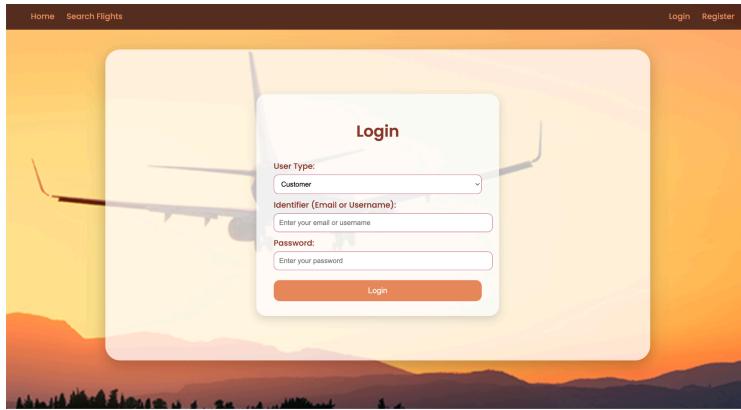
Public / authentication:

<i>home.html</i>	Public home page with navbar that has links to public flight search, login, and registration
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login.html

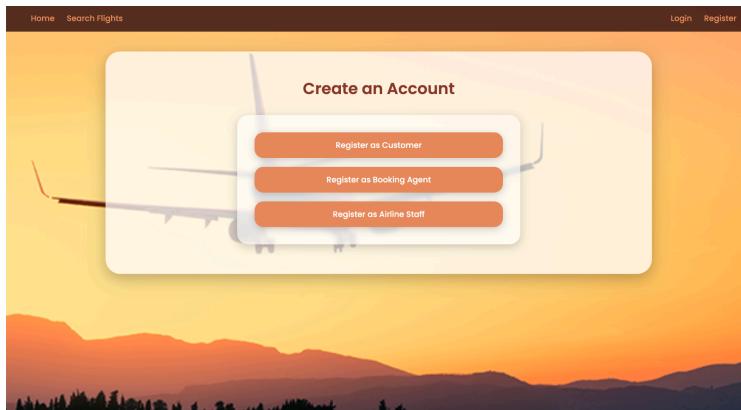
Login form for customers, agents, and staff. Shows an error message if the account does not exist.



The screenshot shows a login interface with a white card. At the top center is the word "Login". Below it is a dropdown menu labeled "User Type" with "Customer" selected. There are three input fields: "Identifier (Email or Username)" containing "testuser", "Password" containing "password", and a "Login" button at the bottom. The background features a warm sunset over mountains with a white airplane silhouette.

register.html

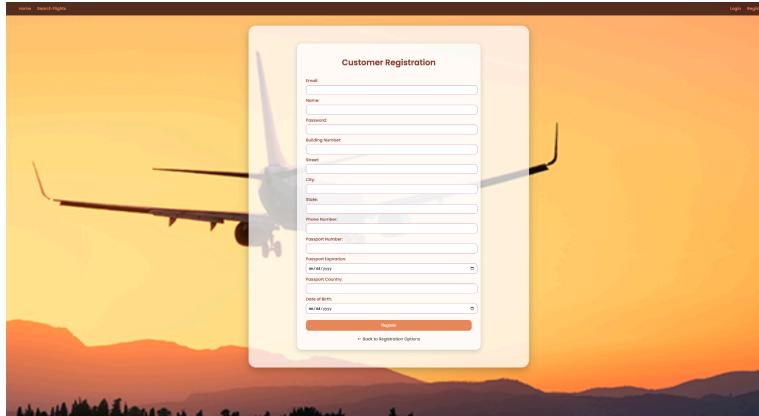
First-step registration form asking for registration user type (customer, booking agent, or airline staff)



The screenshot shows a registration interface with a white card. At the top center is the text "Create an Account". Below it are three orange buttons with white text: "Register as Customer", "Register as Booking Agent", and "Register as Airline Staff". The background features a warm sunset over mountains with a white airplane silhouette.

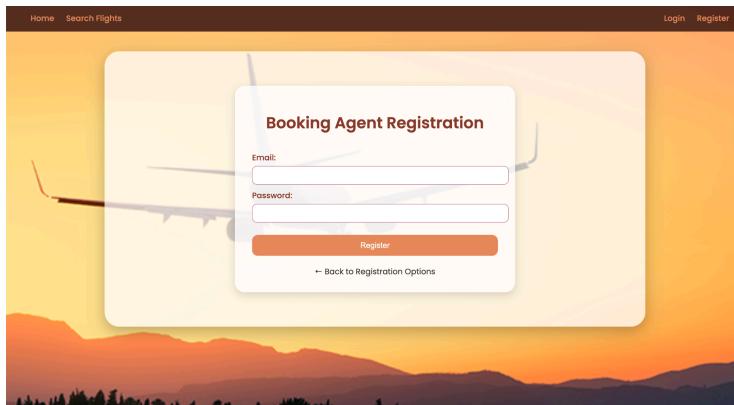
register_customer.html

Second-step registration form for customers, which collects name, address, phone number, passport information, and date of birth



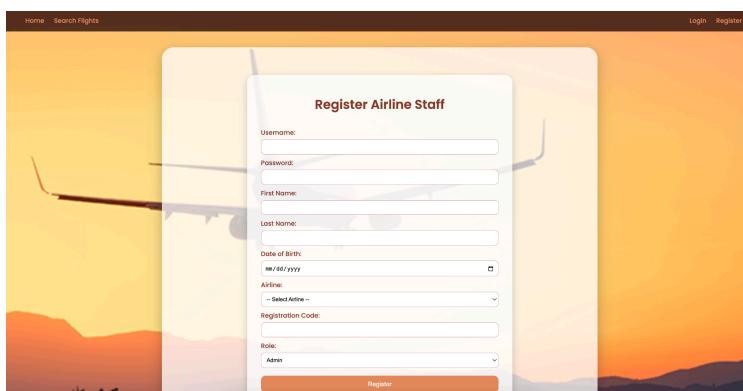
register_agent.html

Second-step registration for booking agent, which collects email and password. Agents must be authenticated by the airline staff admin before being able to view more information past the login.



register_staff.html

Second-step registration form for airline staff; collects username, airline, date of birth, role (admin / operator), and authentication code.



public_search.html

Public flight search page (origin, destination, dates). Displays a table of *search_page.html* matching upcoming flights.

The screenshot shows a flight search interface. On the left, a sidebar titled "Search Filters" contains fields for "Status" (set to "All"), "Airline Name" (with a placeholder "e.g. Delta"), "Flight Number" (with a placeholder "e.g. 102"), "Origin Airport" (with a placeholder "e.g. JFK"), "Departure City" (with a placeholder "e.g. New York"), "Destination Airport" (with a placeholder "e.g. LAX"), "Arrival City" (with a placeholder "e.g. Los Angeles"), and "Date (YYYY-MM-DD)". On the right, a "Flight Results" section displays a table of upcoming flights:

Airline	Flight #	Departure Airport	Departure Time	Arrival Airport	Arrival Time	Status
Qantas	303	SIA	2020-01-08 09:00:00	CNA	2020-01-08 15:30:00	upcoming
Delta Air	101	JFK	2020-01-10 09:00:00	LAX	2020-01-10 13:00:00	In progress
Emirates	202	DXB	2020-01-12 14:00:00	SFO	2020-01-12 23:00:00	upcoming
SkyFly	404	ATL	2020-01-16 07:30:00	JFK	2020-01-16 10:00:00	upcoming
United	805	LAX	2020-01-18 16:00:00	SEA	2020-01-18 19:00:00	upcoming
Delta Air	990	EXX	2020-01-20 12:00:00	ATL	2020-01-20 15:00:00	In progress

Customer views:

customer_dashboard.html

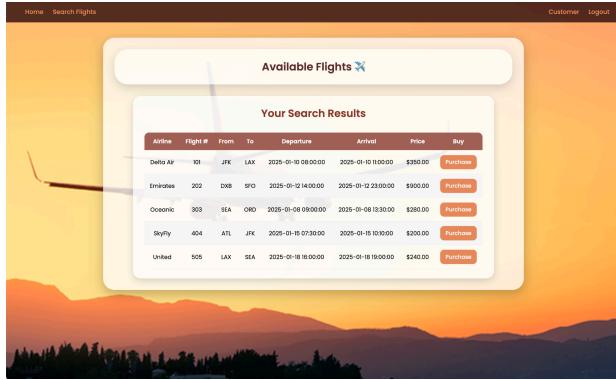
Customer home after login. Contains:

- “Search flights” form with origin, destination, and date filters
- “Your Purchased Flights” button to view bought flights
- “Your Spending Overview (last-12-months total, last-6-months bar chart, and custom date-range spending + chart)

The screenshot shows the customer dashboard. At the top, it says "Welcome Back, abc@gmail.com". Below that is a "Search Flights" form with fields for "Origin Airport", "Destination Airport", and "Date" (set to "2020-01-01"). To the right of the search form is a "Your Purchased Flights" section with a link "View Purchased Flights". Below these are two main sections: "Your Spending Overview" and "Spending in the Last 6 Months". The "Your Spending Overview" section shows a bar chart for "Total Last 12 Months: \$765.00" with a legend for "Monthly Spending". The "Spending in the Last 6 Months" section shows a bar chart from July to December 2020. At the bottom, there is a "View Custom Spending Range" section with date inputs for "Start Date" and "End Date".

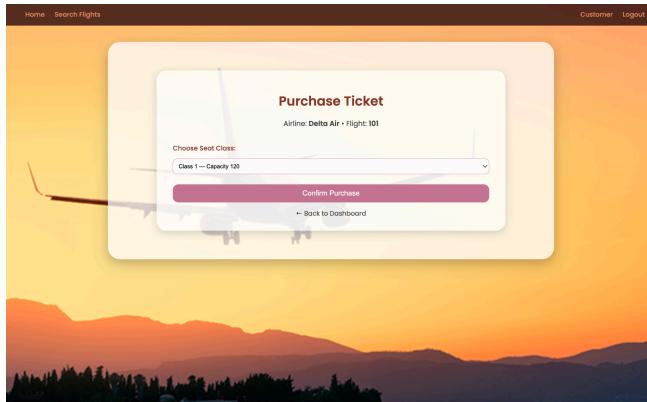
customer_search_result.html

Shows search results for a logged-in customer, with a “Purchase” button for each flight.



customer_purchase.html

Flight purchase page for customers: shows flight info on the top and customer can select seat class then confirm purchase.



customer_purchased_flights.html

Listing of all flights the customer has purchased, including status and times (used by some earlier flows).

The screenshot shows a customer dashboard titled "Your Purchased Flights". On the left, there is a "Filter Flights" section with fields for "Departure Date" (mm/dd/yyyy), "Origin Airport" (e.g. JFK), and "Destination Airport" (e.g. LAX). A "Apply Filters" button is present. On the right, a table titled "Your Flight Results" displays two flight records:

Airline	Flight #	From	To	Departure	Arrival	Status
United	505	LAX	SEA	2025-01-18 16:00:00	2025-01-18 19:00:00	upcoming
Delta Air	101	JFK	LAX	2025-01-10 08:00:00	2025-01-10 11:00:00	upcoming

Booking agent views:

Agent_dashboard.html

Agent home after login. Shows:

- Commission summary (last 30 days).
- Bar chart of their top 5 customers by tickets (last 6 months).
- Bar chart of their top 5 customers by commission (last year).
- Buttons to “Purchase Flight for Customer” and “View Your Booked Flights”.

The screenshot shows an agent dashboard. At the top, it says "Welcome Back, tuy@gmail.com". Below that is a "Agent Tools" section with "Purchase Flight for Customer" and "View Your Booked Flights" buttons. The main area has three sections: "Commission Summary (Last 30 Days)" showing totals and ticket count, "Top 5 Customers — Tickets (Last 6 Months)" showing a bar chart for "Tickets Sold" (orange bars), and "Top 5 Customers — Commission (Last Year)" showing a bar chart for "Commission (\$)" (orange bars). The bottom of each chart shows the email address "tuy@gmail.com".

agent_search_page.html

Page for agents to search for flights to purchase for a customer. The left side has the search filters, and the right side has a scrollable table of upcoming flights with a “Purchase” button.

The screenshot shows a web-based travel booking system. At the top, there are navigation links for 'Home', 'Search Flights', 'Agent', and 'Logout'. The main area is titled 'Search Flights to Purchase' with a small airplane icon. On the left, a 'Filter Flights' section contains fields for 'Origin Airport' (with a dropdown menu), 'Destination Airport' (another dropdown), and 'Date' (a date input field). Below these is an 'Apply Filters' button. To the right, a table titled 'Available Upcoming Flights' lists a single flight: Delta Air, Flight #101, From JFK, To LAX, Departure 2025-01-10 at 08:00:00, Arrival 2025-01-10 at 11:00:00, Base Price \$350.00, and a 'Purchase' button. The background features a scenic sunset over mountains.

agent_purchase.html

Page where agents complete purchase for a selected flight: customer email with seat class on left, and flight summary on right.

The screenshot shows a 'Purchase Flight for Customer' page. On the left, a 'Complete Purchase' form includes fields for 'Customer Email' (with a placeholder 'customer@example.com') and 'Seat Class' (a dropdown menu showing 'Class 1 (Capacity: 120)'). Below these is a 'Purchase Ticket' button. On the right, a 'Flight Details' section displays the flight information: Airline Delta Air, Flight Number 101, and a note 'Select customer + seat class on the left.' The background is a sunset scene.

agent_view_bookings.html

Filterable list of tickets sold by this agent (customer email,

origin/destination, date). Shows flights the agent has booked for customers.

Customer	Airline	Flight #	From	To	Departure	Arrived	Status
abc@gmail.com	Emirates	202	DXB	SFO	2025-01-12 14:00:00		upcoming
abc@gmail.com	Delta Air	101	JFK	LAX	2025-01-10 08:00:00		In-progress

Airline staff views:

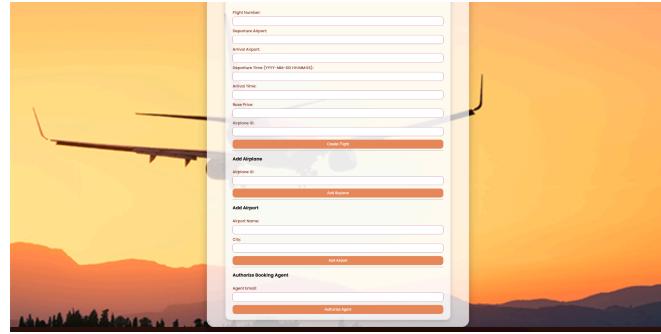
staff_dashboard.html

Staff home after login. Contains:

- Table of upcoming flights for this airline (next 30 days), with “View passengers” button.
- “Customer Flight History” lookup form (by customer email).
- Button linking to the analytics dashboard.
- **If staff is admin:** admin tools card (create flight, add airplane, add airport, authorize booking agent).
- **If staff is operator:** operator tools card (update flight status for flights of their airline).

Admin:

Flight #	From	To	Depature	Arrived	Status
800	LAX	AX	2025-01-12 08:00:00		In-progress



Operator:

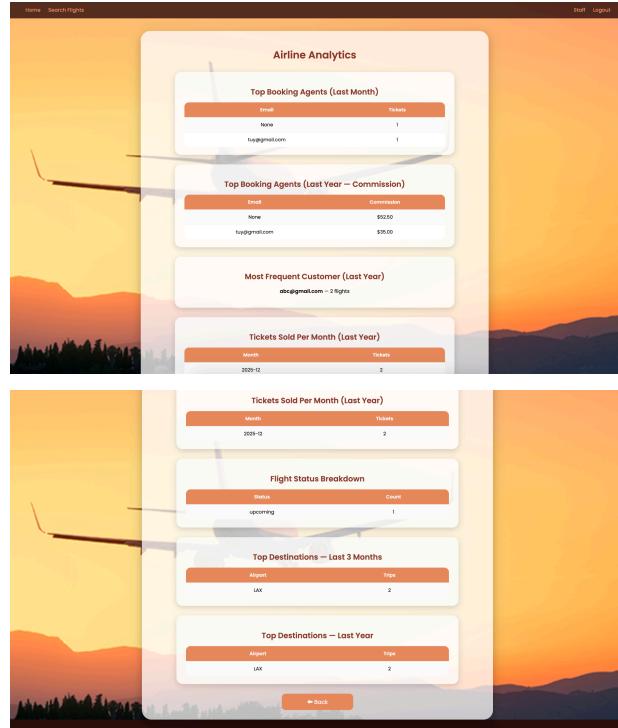
The operator dashboard features a central modal window displaying flight details and customer history. Below the modal are sections for analytics and operator tools.

Flight #	From	To	Departure	Arrival	Status	Passenger
890	LAX	ATL	2026-01-01 12:00:00	2026-01-01 15:00:00	upcoming	View

staff_analytics.html

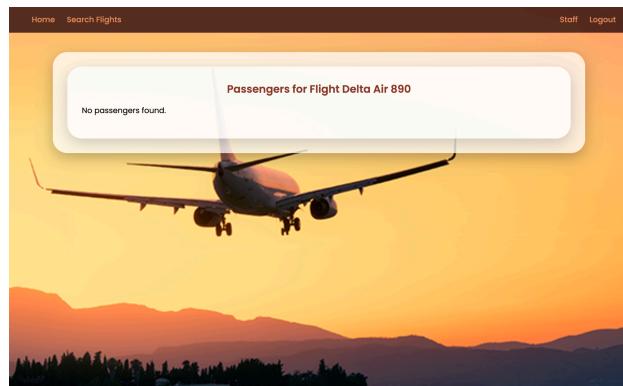
Analytics view for staff:

- Top booking agents by tickets (last month).
- Top booking agents by commission (last year).
- Most frequent customer (last year).
- Tickets sold per month (last year).
- Flight status distribution.
- Top destinations for the last 3 months and last year.



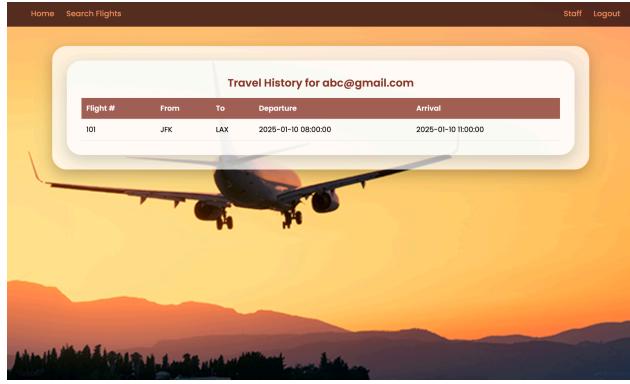
staff_passenger.html

Shows passenger list for a specific flight of the airline (customer emails and ticket info).



staff_customer_history.html

Shows all flights on this airline for a given customer (email), including times and status.



Error templates:

error.html

Used to show user-friendly error messages.

Static Assets:

style.css

Global styling including: background image, typography, form/card visuals, button colors, layout helpers.

Map of each user-facing feature to the database queries it issues.

home() No SQL queries

public_search_page()

```
SELECT * FROM flight          Base query for public flight search
WHERE status = 'upcoming'

AND departure_airport = %s    Filter by origin

AND arrival_airport = %s     Filter by destination

AND DATE(departure_time) = %s Filter by departure date
```

register() No SQL queries

Registration Routes

register_customer()

```
SELECT email FROM customer      Check if the customer already exists
WHERE email = %s

INSERT INTO customer            Insert new customer with hashed password
(email, name, password_hash,
building_number, street, city,
state,
phone_number, passport_number,
passport_expiration,
passport_country,
date_of_birth)
VALUES
(%s,%s,%s,%s,%s,%s,%s,%s,%s,%s,%s)
```

register_agent()

```
SELECT email FROM booking_agent    Check if the agent exists
WHERE email=%s
```

```
INSERT INTO booking_agent          Insert new agent
(email, password_hash) VALUES
(%s, %s)
```

register_staff()

```
SELECT airline_name FROM airline   Load all airlines for the dropdown
```

```
SELECT 1                           Validate registration code
FROM airline
WHERE airline_name = %s
AND staff_reg_hash = SHA2(%s,
256)
```

```
SELECT username FROM
airline_staff WHERE username=%s      Check duplicate username
```

```
INSERT INTO airline_staff           Create staff account
(username, password_hash,
first_name, last_name,
date_of_birth, airline_name,
role)
VALUES (%s,%s,%s,%s,%s,%s,%s)
```

Login/Logout

login()

```
SELECT * FROM customer            Validate customer login
```

```
WHERE email=%s

SELECT * FROM booking_agent      Validate agent login
WHERE email=%s

SELECT username,                Validate Staff login
password_hash, airline_name,
role
FROM airline_staff
WHERE username=%s
```

```
logout()                      No SQL queries
```

Customer

```
customer_dashboard()
```

```
SELECT f.*                      Filters flights
FROM ticket t
JOIN purchases p ON p.ticket_id
= t.ticket_id
JOIN flight f ON f.airline_name
= t.airline_name
AND f.flight_num = t.flight_num
WHERE p.customer_email = %s

AND DATE(f.departure_time) >=    Filters flights added on the criteria
%s                                selected (date, airport, status)
AND DATE(f.departure_time) <=
%s
AND f.departure_airport = %s
AND f.arrival_airport = %s
AND f.status = 'upcoming'

ORDER BY f.departure_time        Sorts the list by departure time

SELECT
COALESCE(SUM(purchase_price),
0) AS total                     Calculates the total spent between certain
dates
```

```
FROM purchases
WHERE customer_email = %s
AND purchase_date BETWEEN %s
AND %s

SELECT DATE_FORMAT(purchase_date,
'%%Y-%%m') AS month,
SUM(purchase_price) AS total
FROM purchases
WHERE customer_email = %s
AND purchase_date BETWEEN %s
AND %s
GROUP BY month
ORDER BY month
```

Gets spending per month between certain dates and orders them by the month

customer_search_flights()

```
SELECT * FROM flight
WHERE status = 'upcoming'

AND departure_airport = %s
AND arrival_airport = %s
AND DATE(departure_time) = %s
```

Base query for public flight search

Filter by origin

Filter by destination

Filter by departure date

customer_purchase(airline_name,flight_num)

```
)
```

```
SELECT airplane_id, base_price
FROM flight
WHERE airline_name = %s AND
flight_num = %s

SELECT seat_capacity
FROM seat_class
WHERE airline_name=%s
```

Base query for public flight search

Finds the total number of seats based on the seat class

```

AND airplane_id=%s
AND seat_class_id=%s

SELECT COUNT(*) AS sold
FROM ticket
WHERE airline_name=%s
AND flight_num=%s
AND airplane_id=%s
AND seat_class_id=%s

SELECT                                     Generates ticket_id number
COALESCE(MAX(ticket_id), 0) + 1
AS next_id FROM ticket

INSERT INTO ticket (ticket_id,           Inserts ticket
airline_name, flight_num,
airplane_id, seat_class_id)
VALUES
(%s, %s, %s, %s, %s)

INSERT INTO purchases                   Inserts purchase
(ticket_id, customer_email,
purchase_date, purchase_price)
VALUES (%s, %s, %s, %s)

SELECT seat_class_id,                  Retrieves the seat class and seat capacity available
seat_capacity
FROM seat_class
WHERE airline_name=%s AND
airplane_id=%s

```

customer_purchased_flights()

```

SELECT f.*
FROM purchases p
JOIN ticket t ON p.ticket_id =
t.ticket_id
JOIN flight f ON f.airline_name
= t.airline_name

```

Retrieves all information from the customer's purchases

```

AND f.flight_num = t.flight_num
WHERE p.customer_email = %s

AND DATE(f.departure_time) >= %s
AND DATE(f.departure_time) <= %s Adds on to the retrieval, depending on the
AND f.departure_airport = %s information the user wants to filter
AND f.arrival_airport = %s

ORDER BY f.departure_time DESC Sorts the list of purchases

```

Agent

agent_dashboard()

```

SELECT
COALESCE(SUM(purchase_price *
0.1),0) AS total_commission,
COALESCE(AVG(purchase_price *
0.1),0) AS avg_commission,
COUNT(*) AS num_tickets
FROM purchases
WHERE booking_agent_email=%s
AND purchase_date BETWEEN %s AND
%s

```

Retrieves the commission information of the agent

```

SELECT customer_email, COUNT(*)
AS num_tickets
FROM purchases
WHERE booking_agent_email=%s
AND purchase_date >= %s
GROUP BY customer_email
ORDER BY num_tickets DESC
LIMIT 5

```

Retrieves the top customers by tickets for the last 6 months

```

SELECT customer_email,
SUM(purchase_price * 0.1) AS
total_commission
FROM purchases

```

Retrieves the top customers by commission for the last 12 months

```
WHERE booking_agent_email=%s
AND purchase_date >= %s
GROUP BY customer_email
ORDER BY total_commission DESC
LIMIT 5
```

agent_search()

```
SELECT airline_name
FROM agent_airline_authorization
WHERE agent_email = %s

SELECT *
FROM flight
WHERE airline_name IN %s
AND status = 'upcoming'

AND departure_airport = %s
AND arrival_airport = %s
AND DATE(departure_time) = %s
```

Gets the airline of the agent

Gets flight information of the airline that is upcoming

Filters for airport, date

agent_purchase()

```
SELECT 1 FROM
agent_airline_authorization
WHERE agent_email=%s AND
airline_name=%s

SELECT airplane_id, base_price
FROM flight
WHERE airline_name=%s AND
flight_num=%s

SELECT seat_capacity FROM
seat_class
WHERE airline_name=%s AND
airplane_id=%s AND
seat_class_id=%s
```

Confirms booking agent is allowed to sell tickets for this airline

Retrieves the airplane used and the base ticket price

Looks up how many seats exist in the chosen class

<pre>SELECT COUNT(*) AS sold FROM ticket WHERE airline_name=%s AND flight_num=%s AND airplane_id=%s AND seat_class_id=%s</pre>	Counts how many seats are already sold in that class
<pre>SELECT COALESCE(MAX(ticket_id),0)+1 AS next FROM ticket</pre>	Gets the next available ticket ID
<pre>INSERT INTO ticket (ticket_id, airline_name, flight_num, airplane_id, seat_class_id) VALUES (%s,%s,%s,%s,%s)</pre>	Creates and inserts a new ticket record for this flight
<pre>INSERT INTO purchases (ticket_id, customer_email, booking_agent_email, purchase_date, purchase_price) VALUES (%s,%s,%s,%s,%s)</pre>	Saves purchase info linking the ticket, customer, agent, and price
<pre>SELECT airplane_id FROM flight WHERE airline_name=%s AND flight_num=%s</pre>	Retrieves airplane ID for display of seat classes
<pre>SELECT seat_class_id, seat_capacity FROM seat_class WHERE airline_name=%s AND airplane_id=%s</pre>	Returns available seat classes to show in the purchase form
agent_view_bookings()	
<pre>SELECT f.*, p.customer_email FROM purchases p JOIN ticket t ON p.ticket_id = t.ticket_id</pre>	Lists all flights purchased through this agent

```

JOIN flight f ON f.airline_name =
t.airline_name
AND f.flight_num = t.flight_num
WHERE p.booking_agent_email = %s

AND p.customer_email = %s
AND f.departure_airport = %s
AND f.arrival_airport = %s
AND DATE(f.departure_time) >= %s

ORDER BY f.departure_time DESC

```

Filters by customer email, origin, destination, or start date

Shows recent bookings first

Staff

staff_dashboard()

```

SELECT *
FROM flight
WHERE airline_name = %s
AND DATE(departure_time) BETWEEN %s
AND %s
ORDER BY departure_time

SELECT DATE_FORMAT(p.purchase_date,
'%%Y-%%m') AS month,
COUNT(*) AS num_tickets
FROM purchases p
JOIN ticket t ON p.ticket_id =
t.ticket_id
WHERE t.airline_name = %s
AND p.purchase_date >= %s
GROUP BY month
ORDER BY month

```

Shows all flights the airline operates in the selected date window

Generates data for the 6 month spending bar chart

staff_passengers()

```

SELECT c.name, c.email
FROM ticket t

```

Lists all passengers for a specific flight belonging to the staff member's airline

```
JOIN purchases p ON p.ticket_id =
t.ticket_id
JOIN customer c ON c.email =
p.customer_email
WHERE t.airline_name=%s AND
t.flight_num=%s
```

staff_customer_history()

```
SELECT f.*
FROM purchases p
JOIN ticket t ON p.ticket_id =
t.ticket_id
JOIN flight f ON f.airline_name =
t.airline_name
AND f.flight_num = t.flight_num
WHERE p.customer_email = %s
AND t.airline_name = %s
ORDER BY f.departure_time DESC
```

Shows full flight history for a specific customer, but only for the staff member's airline

staff_analytics()

```
SELECT booking_agent_email,
COUNT(*) AS tickets
FROM purchases p
JOIN ticket t USING(ticket_id)
WHERE t.airline_name=%s
AND p.purchase_date >=
DATE_SUB(CURDATE(), INTERVAL 1
MONTH)
GROUP BY booking_agent_email
ORDER BY tickets DESC
LIMIT 5
```

Finds the top 5 agents selling the most tickets in the past 30 days

```
SELECT booking_agent_email,
SUM(purchase_price * 0.1) AS
commission
FROM purchases p
```

Ranks the top 5 agents by total commission earned for the airline in the last 12 months

```
JOIN ticket t USING(ticket_id)
WHERE t.airline_name=%s
AND p.purchase_date >=
DATE_SUB(CURDATE(), INTERVAL 1
YEAR)
GROUP BY booking_agent_email
ORDER BY commission DESC
LIMIT 5

SELECT p.customer_email, COUNT(*)
AS flights
FROM purchases p
JOIN ticket t USING(ticket_id)
WHERE t.airline_name=%s
AND p.purchase_date >=
DATE_SUB(CURDATE(), INTERVAL 1
YEAR)
GROUP BY p.customer_email
ORDER BY flights DESC
LIMIT 1

SELECT
DATE_FORMAT(p.purchase_date,
'%%Y-%%m') AS month,
COUNT(*) AS tickets
FROM purchases p
JOIN ticket t USING(ticket_id)
WHERE t.airline_name=%s
AND p.purchase_date >=
DATE_SUB(CURDATE(), INTERVAL 1
YEAR)
GROUP BY month
ORDER BY month

SELECT status, COUNT(*) AS count
FROM flight
WHERE airline_name=%s
GROUP BY status
```

Finds the top 1 customer who flew the most with this airline

Used for our yearly sales chart

Counts flights by upcoming, in-progress, and delayed

```
SELECT f.arrival_airport, COUNT(*) AS trips
FROM ticket t
JOIN purchases p USING(ticket_id)
JOIN flight f ON f.airline_name =
t.airline_name
AND f.flight_num = t.flight_num
WHERE t.airline_name=%s
AND p.purchase_date >=
DATE_SUB(CURDATE(), INTERVAL 3
MONTH)
GROUP BY f.arrival_airport
ORDER BY trips DESC
LIMIT 5
```

```
SELECT f.arrival_airport, COUNT(*) AS trips
FROM ticket t
JOIN purchases p USING(ticket_id)
JOIN flight f ON f.airline_name =
t.airline_name
AND f.flight_num = t.flight_num
WHERE t.airline_name=%s
AND p.purchase_date >=
DATE_SUB(CURDATE(), INTERVAL 1
YEAR)
GROUP BY f.arrival_airport
ORDER BY trips DESC
LIMIT 5
```

staff_create_flight()

```
INSERT INTO flight
(airline_name, flight_num,
departure_airport,
departure_time,
arrival_airport, arrival_time,
base_price, status, airplane_id)
```

Shows where passengers are flying most often in the last 3 months (top 5)

Shows the airline's top 5 most popular destinations of the last 12 months

Inserts flight

VALUES

```
(%s,%s,%s,%s,%s,%s,%s,'upcoming',  
%s)
```

staff_update_status()

```
UPDATE flight  
SET status = %s  
WHERE airline_name = %s  
AND flight_num = %s
```

Updates flight status

staff_add_airplane()

```
INSERT INTO airplane  
(airline_name, airplane_id)  
VALUES (%s,%s)
```

Inserts airplane

staff_add_airport()

```
INSERT INTO airport  
(airport_name, airport_city)  
VALUES (%s,%s)
```

Adds airport

staff_add_agent_auth()

```
SELECT email FROM booking_agent  
WHERE email=%s
```

Gets email from database to check if agent exists

```
SELECT airline_name FROM airline  
WHERE airline_name=%s
```

Gets the airline from the database to check if it exists

```
SELECT *  
FROM agent_airline_authorization  
WHERE agent_email=%s AND  
airline_name=%s
```

Checks authorization

```
INSERT INTO agent_airline_authorization (agent_email, airline_name) VALUES (%s,%s)
```

Inserts authorization

Summary of each member's contributions.

Amelia Tuttle – Backend Logic, Agent & Staff Features, UI Visual Design

- Built most of the agent features (searching flights, purchasing on behalf of the customer, viewing bookings)
- Implemented the airline staff features (creating flights, updating status, adding airplanes/airports, authorizing agents, analytics, and passenger lists)
- Handled a lot of the backend logic and SQL queries for these sections.
- Designed many of the UI visuals: card layouts, scrollable tables, dashboard styles, buttons, and overall page aesthetics.

Susan Wang – Core Interface Structure & Customer-Facing Features

- Set up the general interface structure and main layout templates (login, register)
- Implemented public features (flight search)
- Focused on the customer-facing features (viewing upcoming flights/purchasing, filtering purchased flights, and spending filters/charts)
- Helped unify the look of the site and make sure pages fit together smoothly.

Shared Work

- Collaborated on testing, debugging, and making sure all routes connected properly.
- Worked together to polish the UI and meet all project requirements