



AEROLINK

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ABOUT PROJECT

The surge in global air travel necessitates an updated Airlines Reservation System to cater to today's tech-savvy travelers.

Our project focuses on developing a robust Airline Management System to oversee all operations efficiently. From scheduling flights to managing reservations and handling customer support, the system aims to streamline airline operations effectively.

PROJECT OBJECTIVES

- Streamline flight reservations
- Enhance customer experience
- Optimize airline operations
- Manage flight information
- Facilitate secure transaction process

DESIGN SUMMARY

Defining System Needs :

To manage the Airline Database effectively, our initial task was determining the data to be stored, how to access the data, and analysis for overseeing the airline reservation system.

Structuring the Schema :

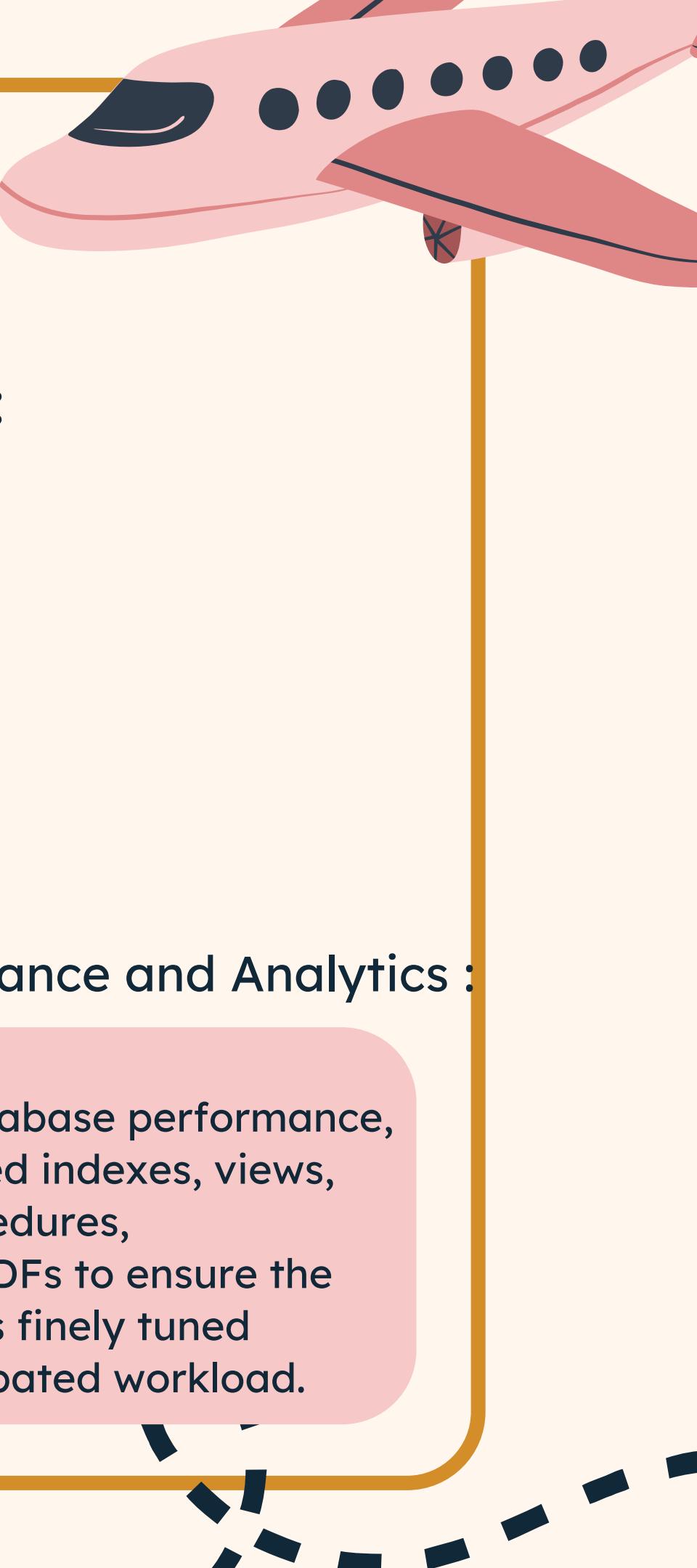
Afterwards, we undertook the task of establishing the schema, outlining the different entity types like Flight, Airline, and Reservation, including their interrelationships and cardinalities, in line with the specified requirements.

Data Implementation :

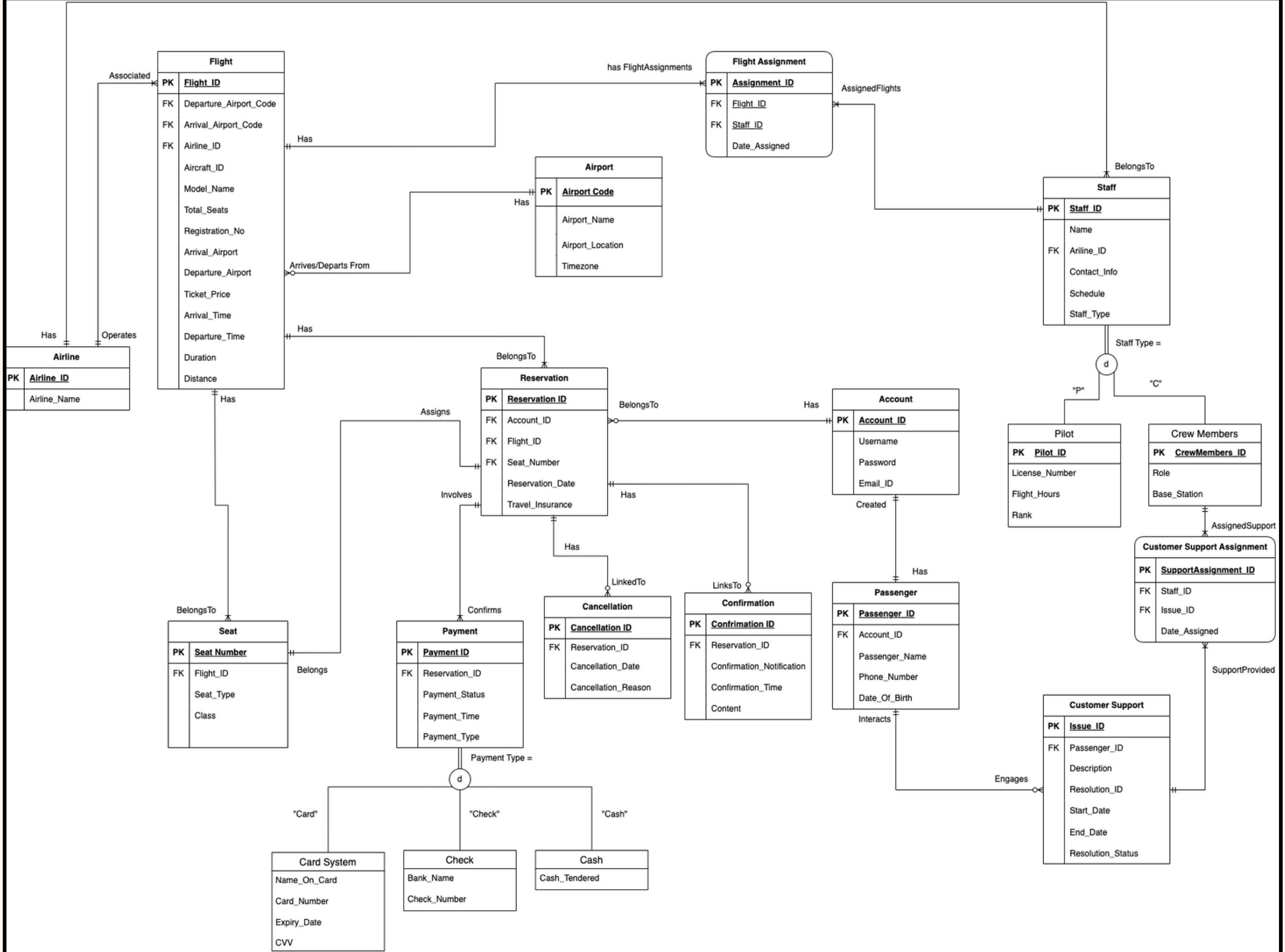
Upon completion of the ER diagram, we proceed to develop the DDL Commands and DML Insert Statements required for our database.

Enhancing Performance and Analytics :

For optimizing database performance, we implemented indexes, views, procedures, triggers, and UDFs to ensure the database is finely tuned for the anticipated workload.



E-R DIAGRAM



STORED PROCEDURE

VIEW

```

CREATE PROCEDURE BookFlight(
    @p_Username NVARCHAR(255),
    @p_Flight_ID VARCHAR(10),
    @p_Departure_Airport_Code VARCHAR(25),
    @p_Arrival_Airport_Code VARCHAR(25),
    @p_Seat_No VARCHAR(10),
    @p_Travel_Insurance VARCHAR(3),
    @p_Payment_Type VARCHAR(10),
    @p_OutputMessage NVARCHAR(1000) OUTPUT
)
AS
BEGIN
    DECLARE @v_AccountID INT;
    DECLARE @v_ReservationID INT;
    DECLARE @v_PaymentID INT;
    DECLARE @v_ConfirmationID INT;
    DECLARE @v_PassengerName VARCHAR(100);

    SELECT @v_AccountID = Account_ID FROM Account WHERE Username = @p_Username;

    IF @v_AccountID IS NULL
    BEGIN
        SET @p_OutputMessage = 'Invalid username. Please provide a valid username.';
        RETURN;
    END;

    IF NOT EXISTS (SELECT 1 FROM Seat WHERE Seat_No = @p_Seat_No AND Flight_ID = @p_Flight_ID)
    BEGIN
        SET @p_OutputMessage = 'The selected seat does not exist in the specified flight. Please choose another seat.';
        RETURN;
    END;

    IF EXISTS (SELECT 1 FROM Reservation WHERE Seat_No = @p_Seat_No AND Flight_ID = @p_Flight_ID)
    BEGIN
        SET @p_OutputMessage = 'The selected seat is already reserved for the specified flight. Please choose another seat.';
        RETURN;
    END;

    IF NOT EXISTS (
        SELECT 1
        FROM Flight
        WHERE Flight_ID = @p_Flight_ID
        AND Departure_Airport_Code = @p_Departure_Airport_Code
    )

```

```

DECLARE @OutputMessage NVARCHAR(1000);

EXEC BookFlight
    @p_Username = 'AishwaryaJames',
    @p_Flight_ID = 'DL5678',
    @p_Departure_Airport_Code = 'LAX',
    @p_Arrival_Airport_Code = 'LHR',
    @p_Seat_No = 'DLA4',
    @p_Travel_Insurance = 'Yes',
    @p_Payment_Type = 'Card',
    @p_OutputMessage = @OutputMessage OUTPUT;

5      Started executing query at Line 83
      (1 row affected)
      (1 row affected)
      (1 row affected)
Passenger Name: Aishwarya James, Flight ID: DL5678, Departure Airport Code: LAX, Arrival Airport Code: LHR, Seat Number: DLA4, Reservation ID: 26, Payment ID: 16, Confirmation ID: 16
Total execution time: 00:00:00.091

```

OUTPUT

Payment_ID	Payment_Amount	Payment_Status	Reservation_ID	Reservation_date	Flight_ID	Seat_No
1	200.00	paid	11	2024-03-15 09:00:00.000	AA1234	AAF1
2	220.00	pending	12	2024-03-16 10:00:00.000	DL5678	DLW7
3	180.00	paid	13	2024-03-17 11:00:00.000	UA9012	UAE5
4	250.00	failed	14	2024-03-18 12:00:00.000	BA4321	BAB12
5	210.00	paid	15	2024-03-19 13:00:00.000	AF8765	AFW15
6	230.00	paid	16	2024-03-20 14:00:00.000	LH2468	LHW13
7	190.00	pending	17	2024-03-21 15:00:00.000	EK1357	EKW13
8	260.00	failed	18	2024-03-22 16:00:00.000	SQ9876	SQW15
9	240.00	paid	19	2024-03-23 17:00:00.000	TK5432	TKW19
10	270.00	paid	20	2024-03-24 18:00:00.000	QF2109	QFE17
11	200.00	paid	21	2024-03-15 09:00:00.000	QF1234	AAF1
12	260.00	paid	22	2024-03-16 10:00:00.000	SQ9876	SQW15
13	260.00	paid	23	2024-03-15 09:00:00.000	SQ9876	SQaW1
14	240.00	paid	24	2024-03-16 10:00:00.000	TK5432	TKA6
15	190.00	pending	25	2024-03-15 09:00:00.000	EK1357	EKW7
16	220.00	pending	26	2024-04-22 16:05:15.890	DL5678	DLA4

Cancel Disconnect Change | Database: AeroLink_System

```

CREATE VIEW PaymentSummaryView AS
SELECT
    p.Payment_ID,
    p.Amount AS Payment_Amount,
    p.Payment_Status,
    r.Reservation_ID,
    r.Reservation_date,
    r.Flight_ID,
    r.Seat_No
FROM
    Payment p
JOIN
    Reservation r ON p.Reservation_ID = r.Reservation_ID;

```

TRIGGERS

```

CREATE OR ALTER TRIGGER trg_UpdateSeatAvailability
ON Cancellation
AFTER INSERT
AS
BEGIN
    UPDATE Flight
    SET Seats_Booked = CASE
        WHEN Seats_Booked > 0 THEN Seats_Booked - 1
        ELSE Seats_Booked
    END
    FROM inserted i
    INNER JOIN Reservation r ON i.Reservation_ID = r.Reservation_ID
    INNER JOIN Flight f ON r.Flight_ID = f.Flight_ID;
END;

-- Verifying the 1st Trigger
INSERT INTO Cancellation (Cancellation_Date, Cancellation_Reason, Reservation_ID)
VALUES (GETDATE(), 'Changed plans', 21);

SELECT * FROM Cancellation;
SELECT * from Flight;

```

OUTPUT

	Cancellation_ID	Cancellation_Date	Cancellation_Reason	Reservation_ID			
1	1	2024-03-15 09:00:00.000	Weather conditions	12			
2	2	2024-03-17 11:00:00.000	Personal reasons	15			
3	3	2024-03-20 14:00:00.000	Overbooking	16			
4	4	2024-04-22 18:35:23.717	Changed plans	21			
	Departure_time	Duration	Distance	Airline_ID	Departure_Airport_Code	Arrival_Airport_Code	Seats_Booked
.000	2024-04-02 07:00:00.000	02:00:00	900 miles	AR	DAD	HND	1
.000	2024-04-01 19:00:00.000	02:00:00	800 miles	BA	CDG	DXB	0
.000	2024-04-01 13:00:00.000	02:00:00	600 miles	DL	LAX	LHR	0
.000	2024-04-02 13:00:00.000	02:00:00	1100 miles	EK	SIN	HKG	0
.000	2024-04-02 10:00:00.000	02:00:00	1000 miles	LH	HND	SIN	1
.000	2024-04-04 10:00:00.000	02:00:00	500 miles	QF	NRT	LAX	0
.000	2024-04-03 07:00:00.000	02:00:00	1400 miles	QF	MIA	JFK	1
.000	2024-04-04 16:00:00.000	02:00:00	700 miles	QF	LAX	MIA	0

UDF

```

CREATE FUNCTION CalculateTotalRevenueByAirline (@AirlineID VARCHAR(25))
RETURNS DECIMAL(10, 2)
AS
BEGIN
    DECLARE @TotalRevenue DECIMAL(10, 2);

    SELECT @TotalRevenue = SUM(F.Ticket_Price * F.Seats_Booked)
    FROM Flight F
    WHERE F.Airline_ID = @AirlineID;

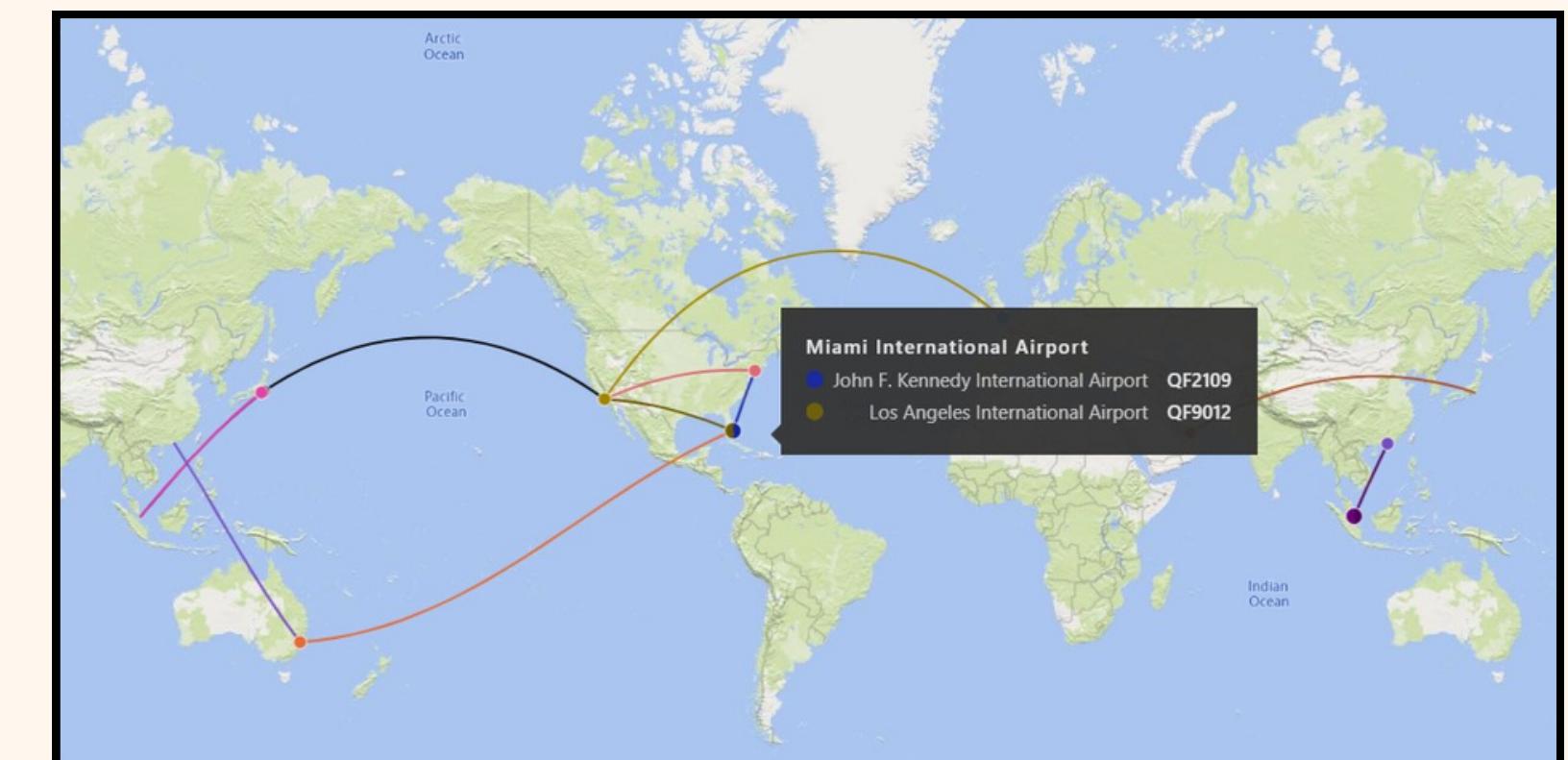
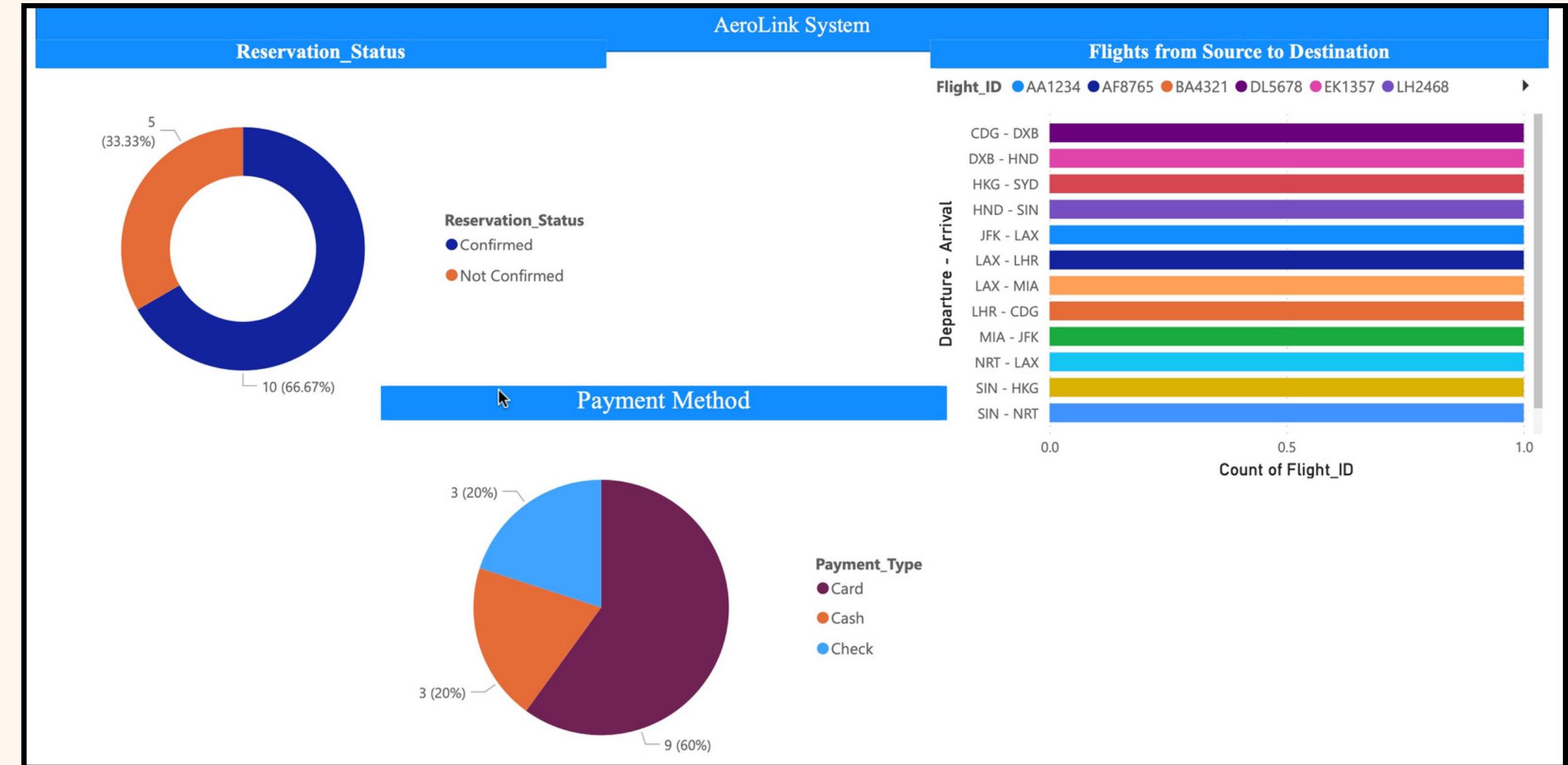
    RETURN ISNULL(@TotalRevenue, 0);
END;

```

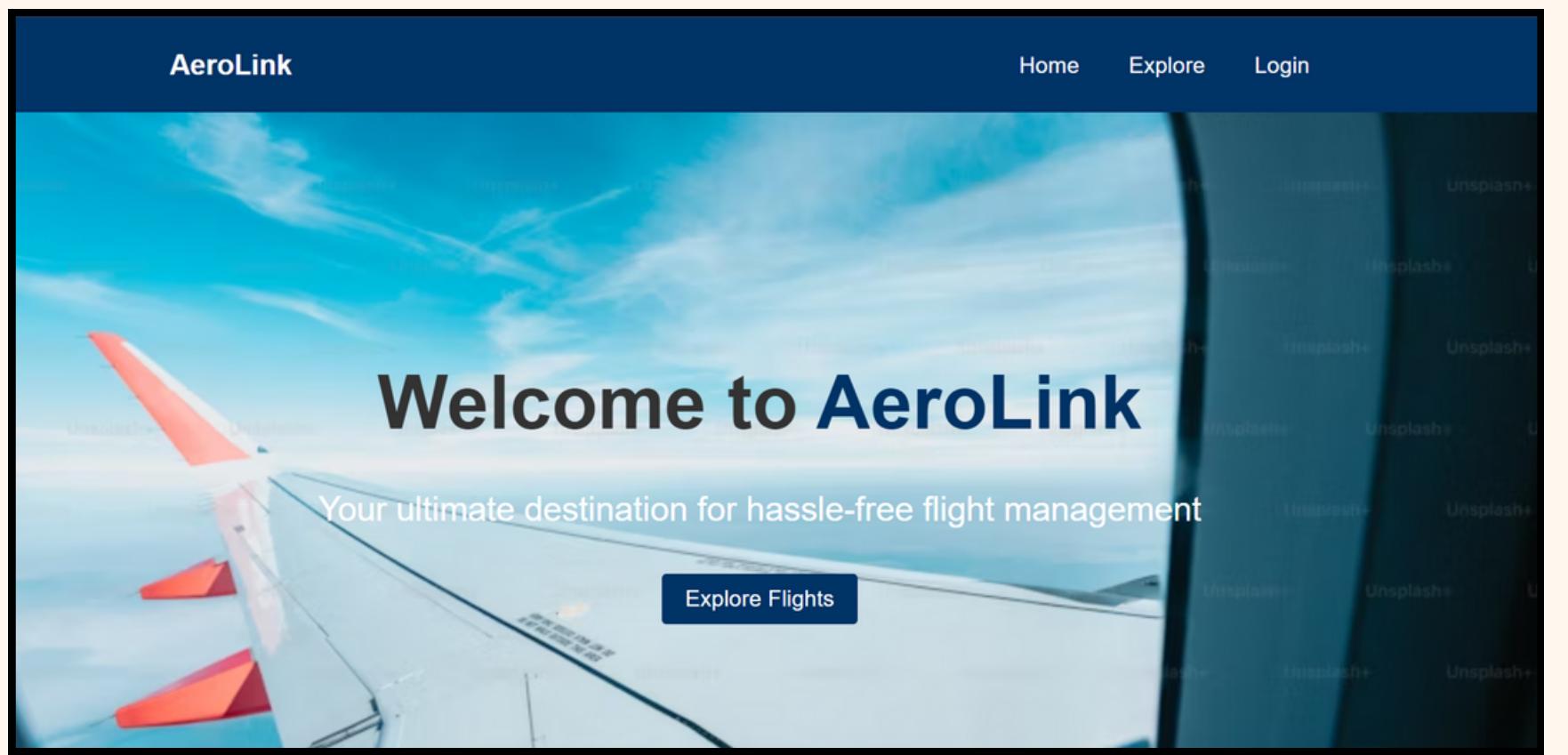
OUTPUT

	Airline_ID	Airline_Name	Total_Revenue
1	AA	American Airlines	200.00
2	AF	Air France	210.00
3	BA	British Airways	0.00
4	DL	Delta Air Lines	0.00
5	EK	Emirates	0.00
6	LH	Lufthansa	230.00
7	QF	Qantas Airways	470.00
8	SQ	Singapore Airlin...	520.00
9	TK	Turkish Airlines	480.00
10	UA	United Airlines	180.00

VISUALIZATIONS



GUI



AeroLink

Home Explore Login

Destination

Airline

Departure Time

Apply Filters

JFK to LAX
Departure: 06:00 AM
Arrival: 08:00 AM
Airline: AA
Ticket Price: \$200

AeroLink

Home Explore Login

Flight Details for AA1234

Flight ID: AA1234
Aircraft ID: B737
Model Name: Boeing 737
Total Seats: 150
Registration No: N123AA
Departure Airport: John F. Kennedy International Airport
Arrival Airport: Los Angeles International Airport
Ticket Price: \$200
Departure Time: 4/1/2024, 6:00:00 AM
Arrival Time: 4/1/2024, 8:00:00 AM
Duration: 02:00:00.0000000
Distance: 500 miles
Airline ID: AA
Departure Airport Code: JFK
Arrival Airport Code: LAX

AeroLink

Home Explore Login

Book Flight

Username

Flight ID

Departure Airport Code

Arrival Airport Code

Seat No

Select Travel Insurance

Select Payment Type

Book Now

THANK YOU!



PROFESSOR MANUEL

GITHUB:

https://github.com/Aumpatelarjun/DMDD_grp_10