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A photograph of a modern, light-colored residential building with multiple balconies and glass railings. The building is set against a backdrop of a blue sky with scattered white clouds.

AIRBNB DATABASE

IMT 563 - TEAM 7

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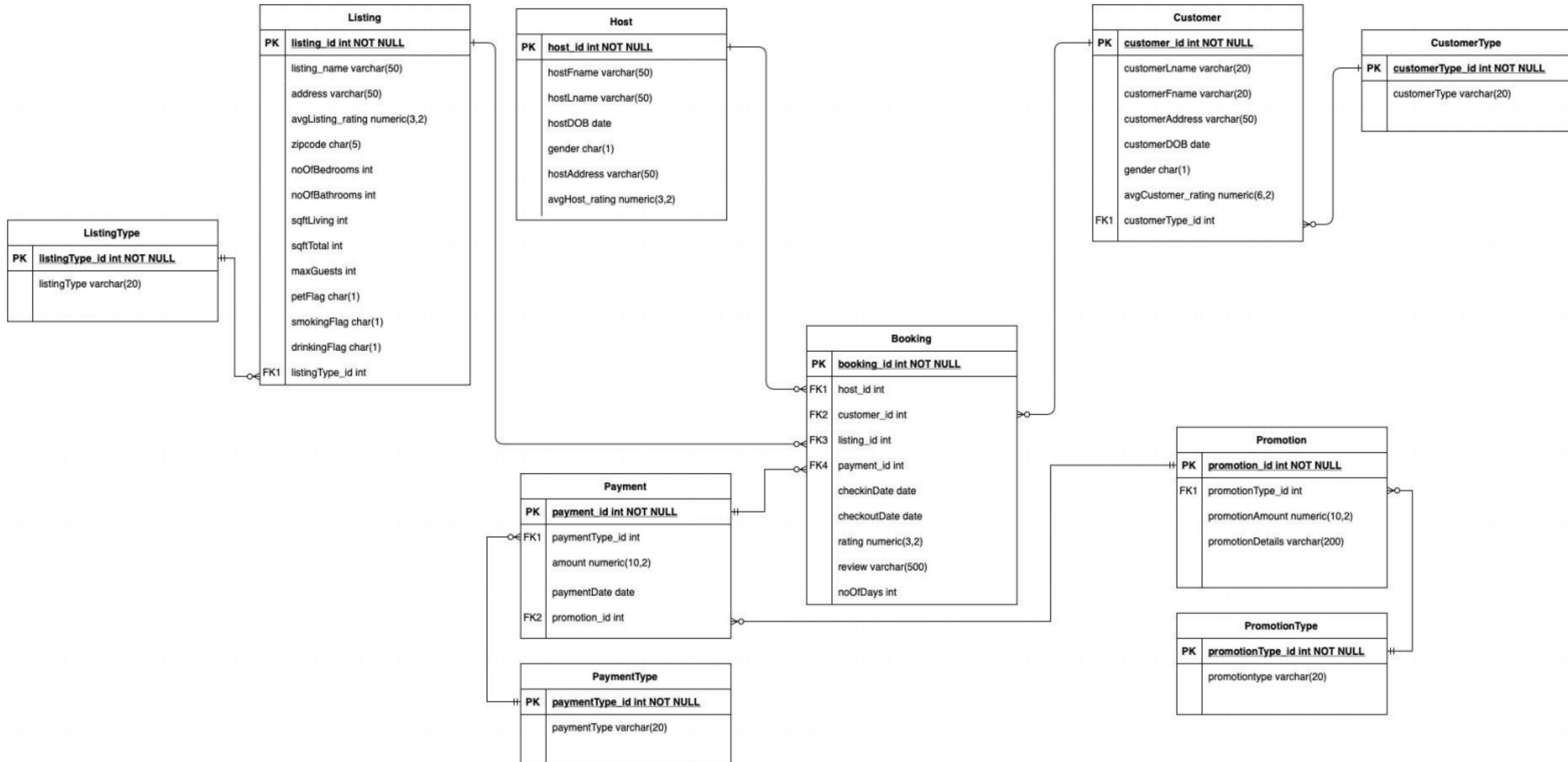


BUSINESS PROBLEM STATEMENT

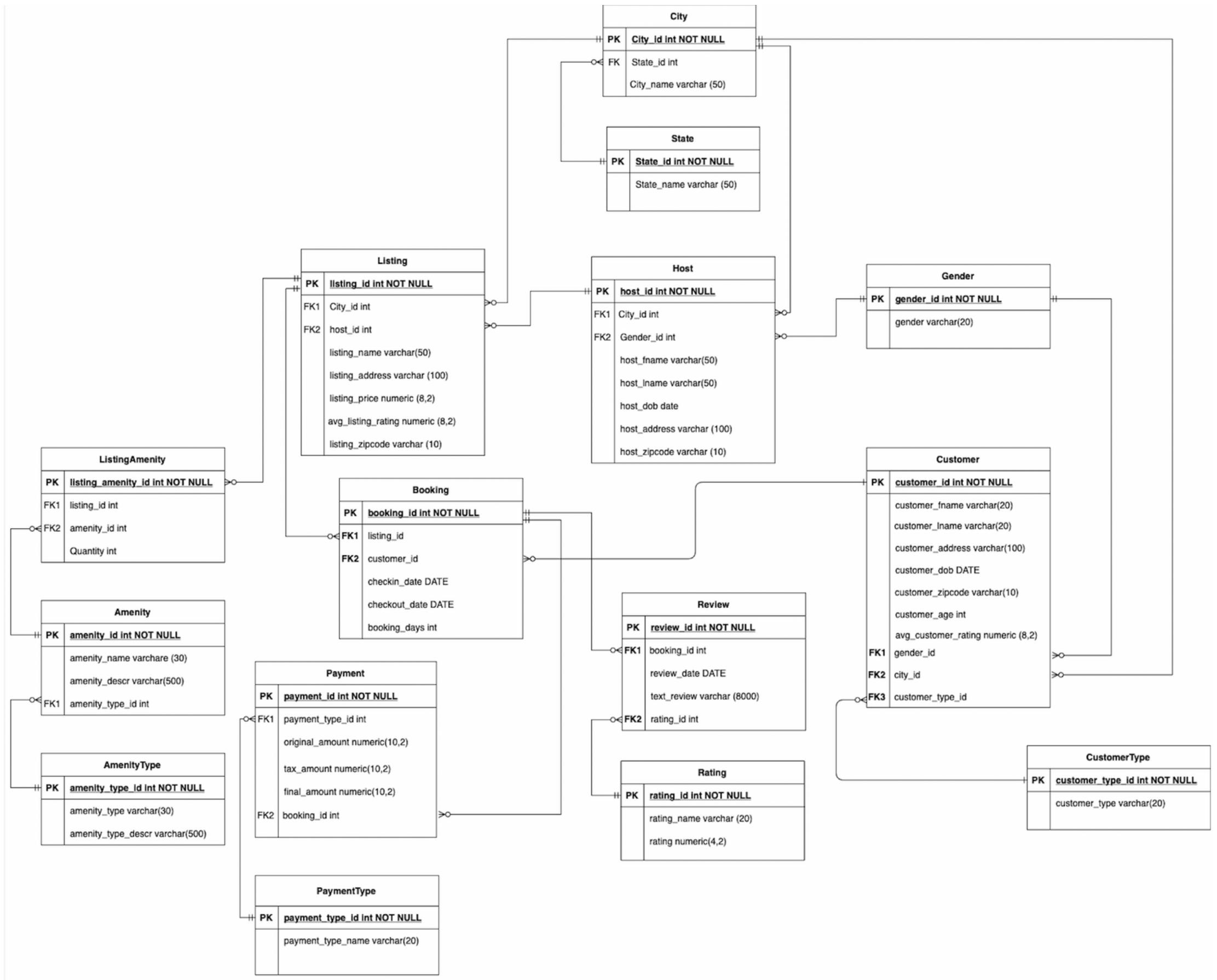
- AirBnB : a service that helps rent out properties temporarily.
- System that provides information about hosts, listings, customers and their bookings.
- System used to analyze patterns and trends in bookings for the customer base, generate information about revenue, etc.



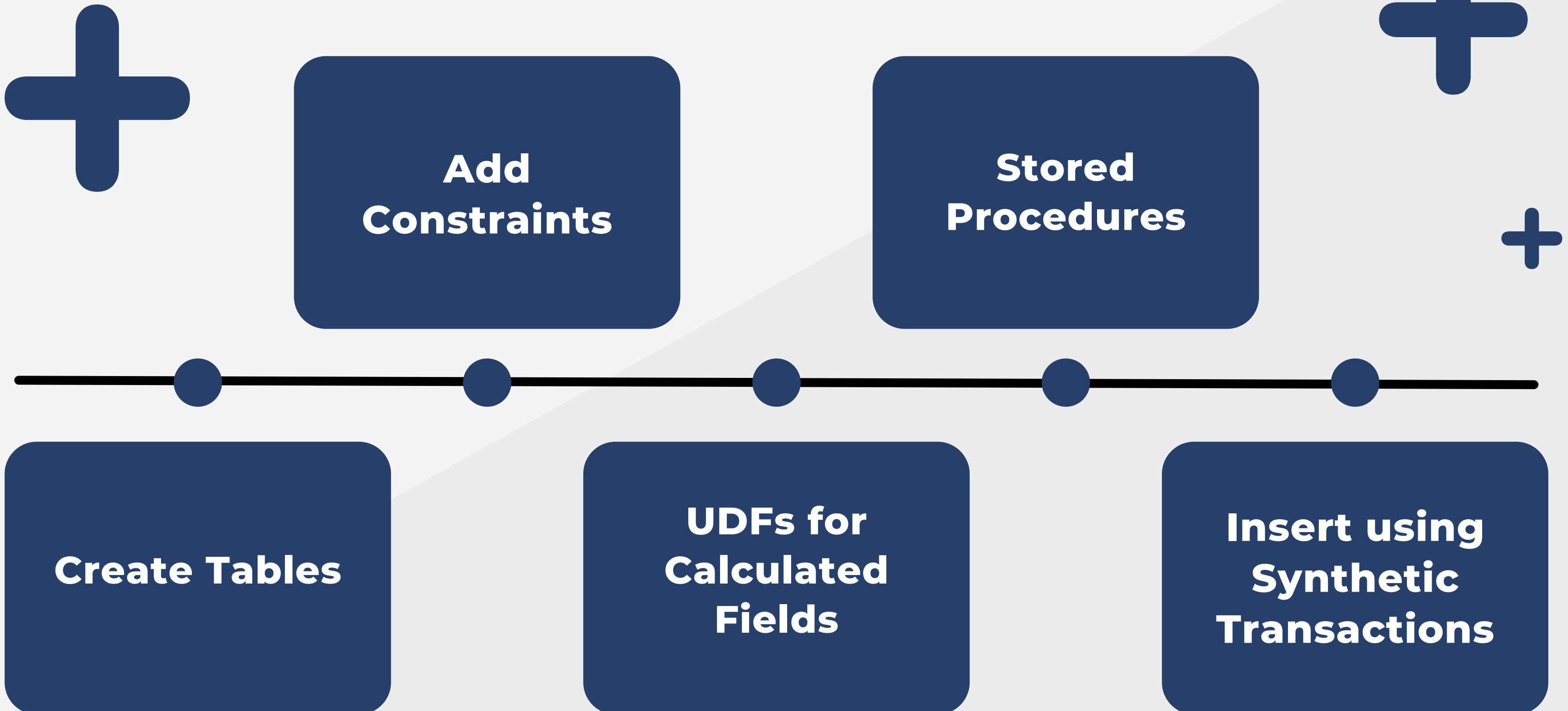
DRAFT ERD



FINAL ERD



PHYSICAL DATABASE DESIGN



1. Create Tables

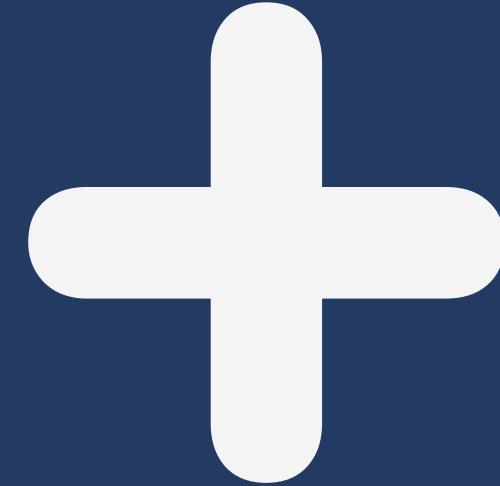
```
CREATE TABLE tblBooking
(
    BookingID INT IDENTITY(1,1) PRIMARY KEY,
    ListingID INT FOREIGN KEY REFERENCES tblListing (ListingID),
    CustomerID INT FOREIGN KEY REFERENCES tblCustomer (CustomerID),
    CheckInDate DATE NOT NULL,
    CheckOutDate DATE NOT NULL,
    BookingDays INT
)
```



2. Add Constraints

```
BEGIN TRANSACTION T10
ALTER TABLE tblBooking
ADD CHECK(BookingDays <= 10)
COMMIT TRANSACTION T10

BEGIN TRANSACTION T11
ALTER TABLE tblBooking
add CHECK(CheckInDate < CheckOutDate)
COMMIT TRANSACTION T11
```



3. UDFs for Calculated Fields

```
CREATE FUNCTION CalcBookingDays (@Checkin DATE, @Checkout DATE)
RETURNS INT AS
BEGIN
    DECLARE @Days INT;
    SET @Days = DATEDIFF(DAY, @Checkin, @Checkout);

    RETURN @Days
END;
```



4. Stored Procedures and Insert using Synthetic Transactions

```
GO
CREATE PROC Wrapper_InsertBooking
@RUN INT
AS
DECLARE @L_ID INT, @Cust_ID INT, @InDate DATE, @OutDate DATE, @NDays INT
DECLARE @Key_L INT, @Key_Cust INT
DECLARE @L_count INT = (SELECT COUNT(*) FROM tblListing)
DECLARE @Cust_count INT = (SELECT COUNT(*) FROM tblCustomer)
DECLARE @Min_L INT = (SELECT MIN(ListingID) FROM tblListing)
DECLARE @Min_Cust INT = (SELECT MIN(CustomerID) FROM tblCustomer)
DECLARE @DateStart Date = '2020-01-01', @DateEndDate = GETDATE()

WHILE @RUN > 0
BEGIN
    DECLARE @N1 INT = Rand() * DateDiff(Day, @DateStart, @DateEnd)
    DECLARE @N2 INT = (RAND() * 10) + 1

    SET @Key_L = (SELECT (RAND() * @L_count) + @Min_L)
    SET @Key_Cust = (SELECT (RAND() * @Cust_count) + @Min_Cust)
    SET @L_ID = (SELECT ListingID FROM tblListing WHERE ListingID = @Key_L)
    SET @Cust_ID = (SELECT CustomerID FROM tblCustomer WHERE CustomerID = @Key_Cust)
    SET @InDate = (SELECT DATEADD(DAY, @N1, @DateStart))
    SET @OutDate = (SELECT DATEADD(DAY, @N2, @InDate))
    SET @NDays = (SELECT dbo.CalcBookingDays(@InDate, @OutDate))

    BEGIN TRANSACTION T3
    INSERT INTO tblBooking (ListingID, CustomerID, CheckInDate, CheckOutDate,
    BookingDays)
    VALUES (@L_ID, @Cust_ID, @InDate, @OutDate, @NDays)
    IF @@ERROR <> 0
        BEGIN
            PRINT '@@ERROR <> 0; terminating process'
            ROLLBACK TRANSACTION T3
        END
    ELSE
        COMMIT TRANSACTION T3
    END
    SET @RUN = @RUN - 1
END
;

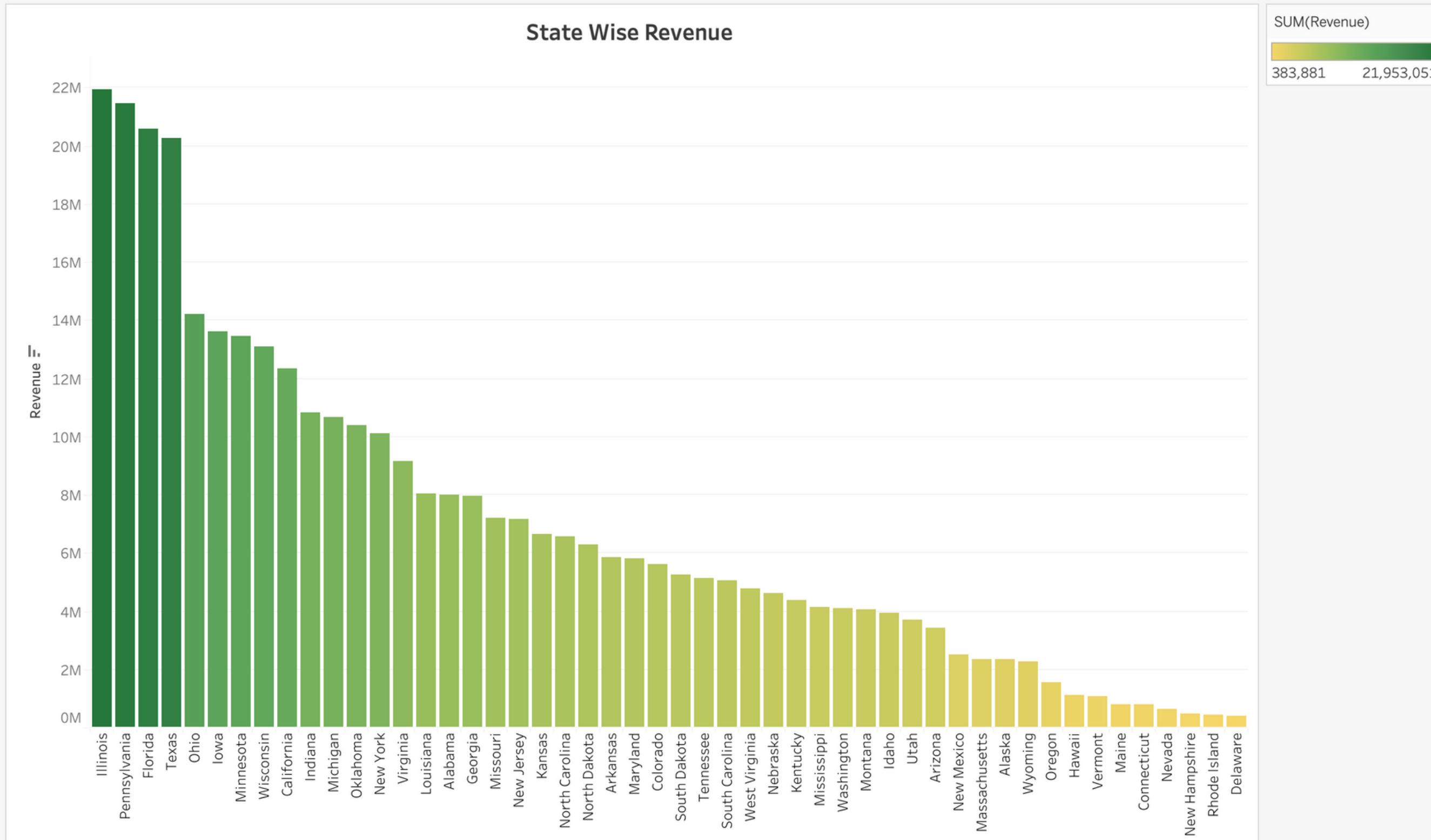
EXEC Wrapper_InsertBooking 100000
```



SELECT * FROM tblBooking

	BookingID	ListingID	CustomerID	CheckInDate	CheckOutDate	BookingDays
1	1	3856	275641	2022-04-24	2022-04-30	6
2	2	1462	111198	2020-05-27	2020-06-04	8
3	3	6409	308469	2022-03-09	2022-03-10	1
4	4	5223	69873	2021-12-03	2021-12-12	9
5	5	3309	5879	2021-06-13	2021-06-14	1
6	6	2311	55002	2021-02-07	2021-02-17	10
7	7	9590	98142	2021-01-26	2021-01-29	3
8	8	3091	12614	2022-04-30	2022-05-07	7
9	9	5580	181055	2021-05-15	2021-05-19	4

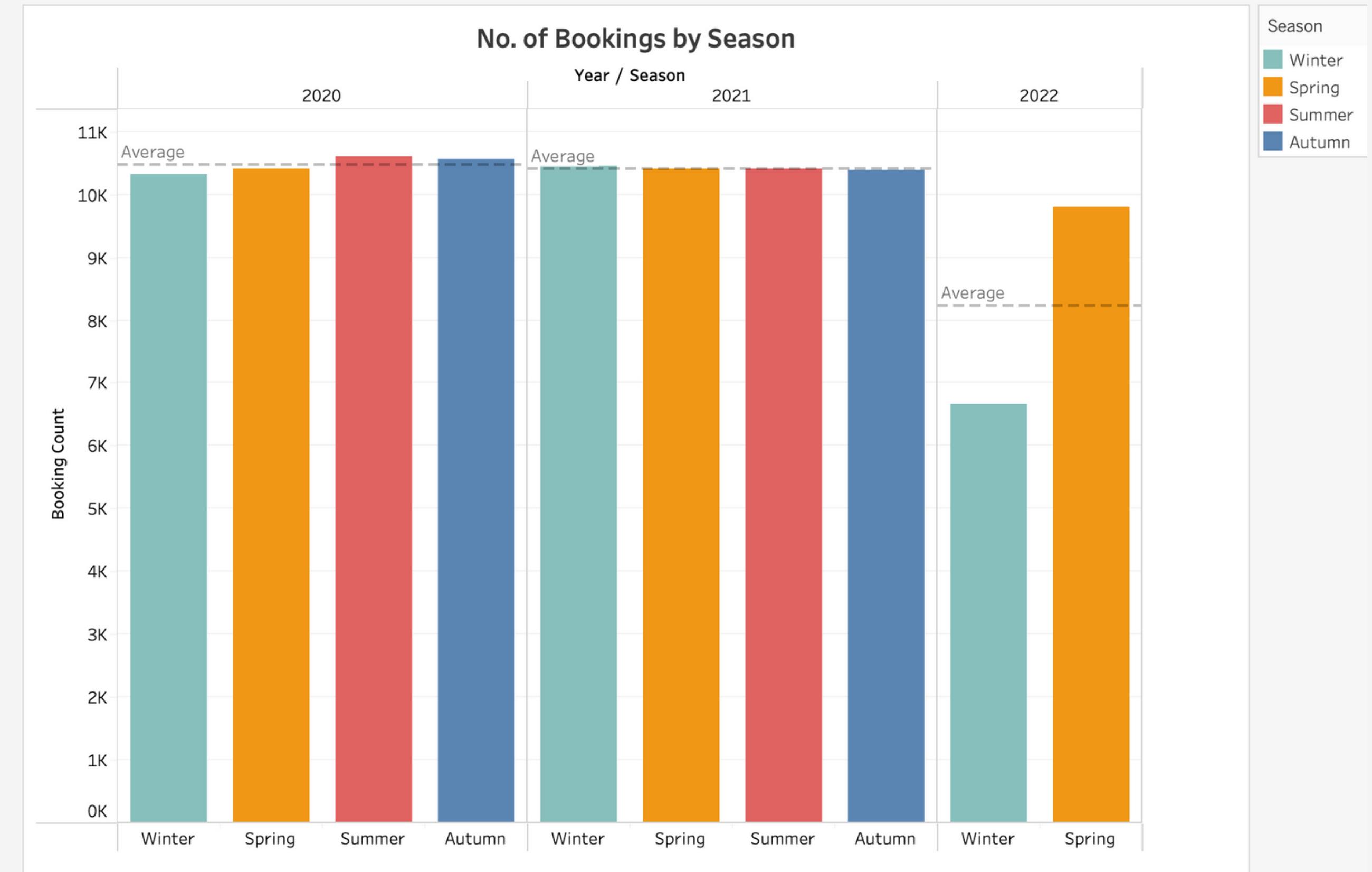
DATA VISUALIZATIONS



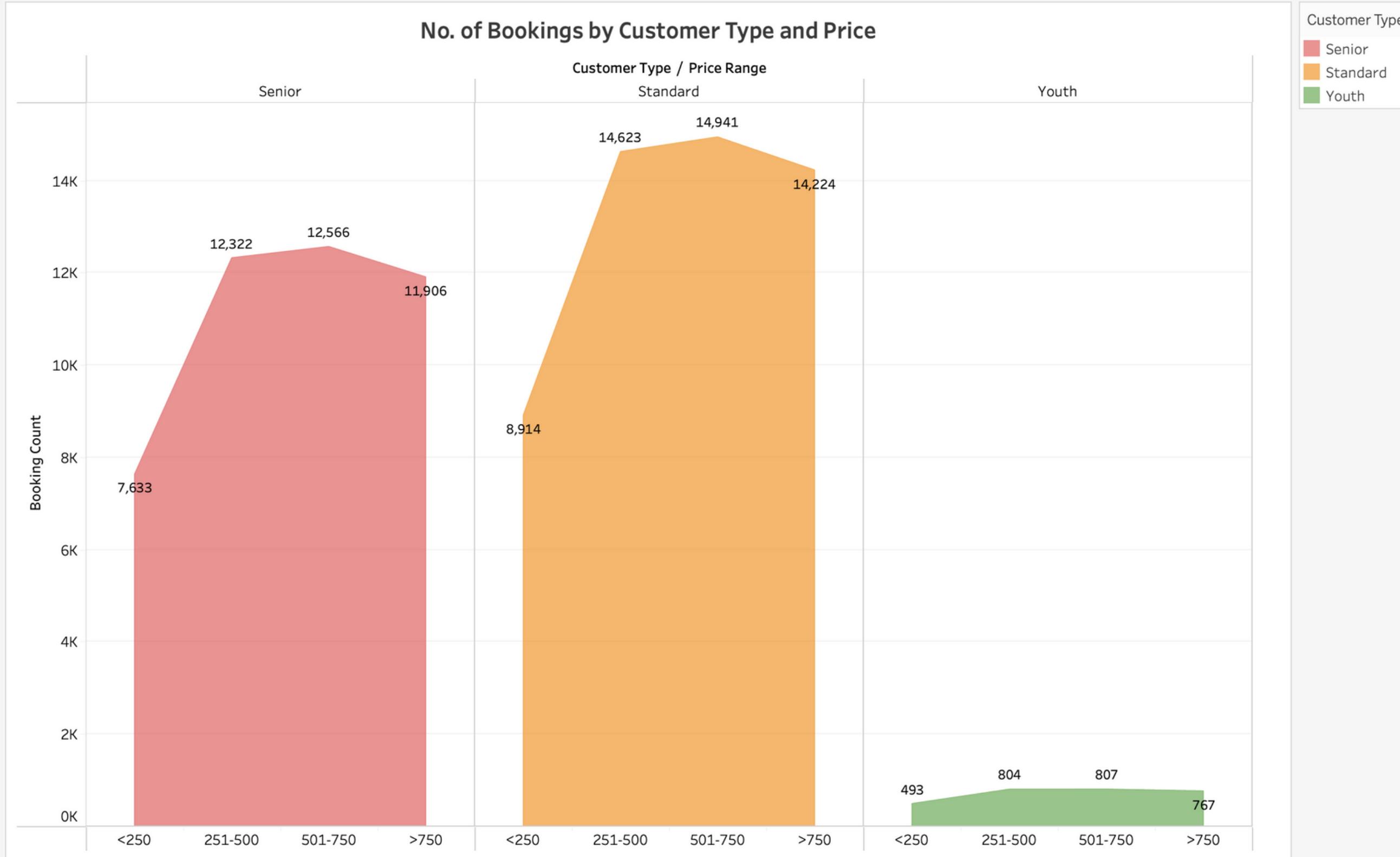
- Help stakeholders identify where and how they need to improve service to increase revenue and subsequently profit
- Illinois is the top performer in terms of revenue generated
- Delaware had the lowest revenue of all states

DATA VISUALIZATIONS CNTD.

- Assist stakeholders prepare well in advance for peak holiday/booking season
- For 2020 and 2021, no. of bookings remained constant throughout the year
- Drop in winter 2022 followed by an increase in spring



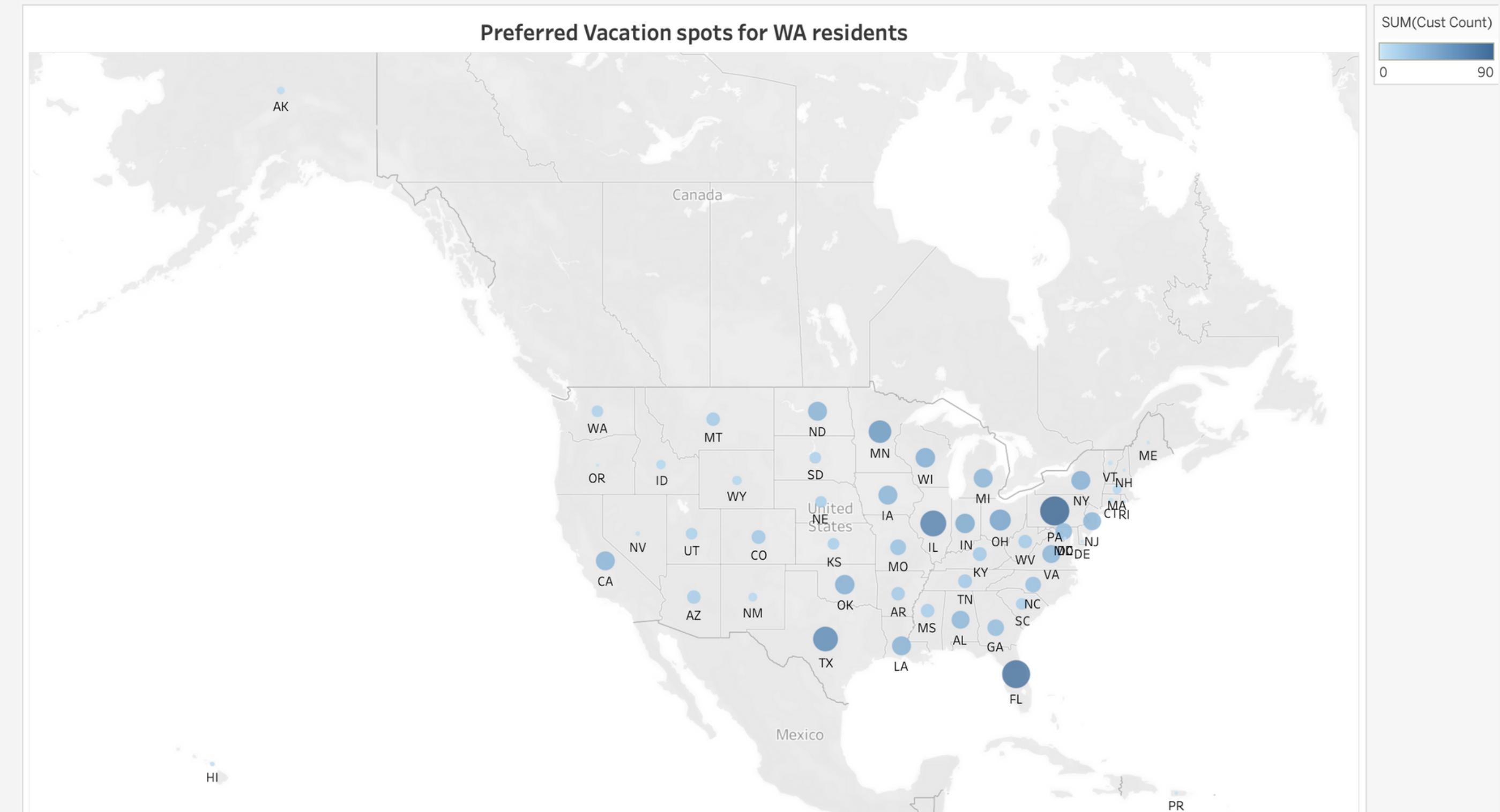
DATA VISUALIZATIONS CNTD.



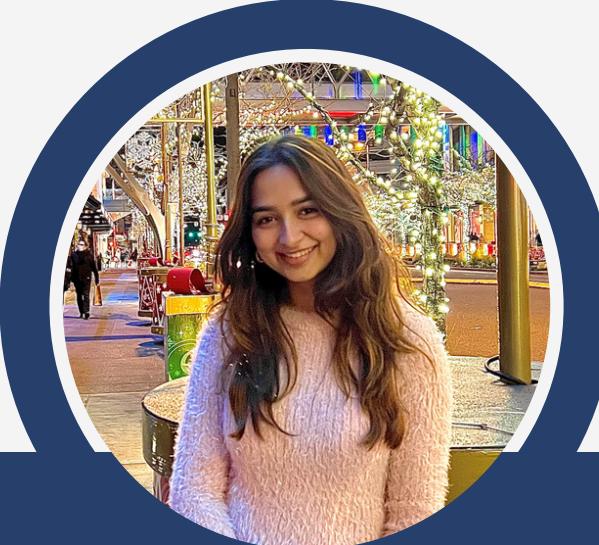
- Help stakeholders, specifically hosts identify their major customer base and their price preferences.
- Major customer base between age 26 and 60
- Youths do not prefer AirBnBs
- Majority customer base is willing to pay between \$250-\$1000 for their bookings

DATA VISUALIZATIONS CNTD.

- Stakeholder can focus on specific customer base
 - Pennsylvania, Florida and Illinois are AirBnB hotspots for WA residents
 - Delaware, Puerto Rico, New Hampshire and Washington DC do not attract any WA residents



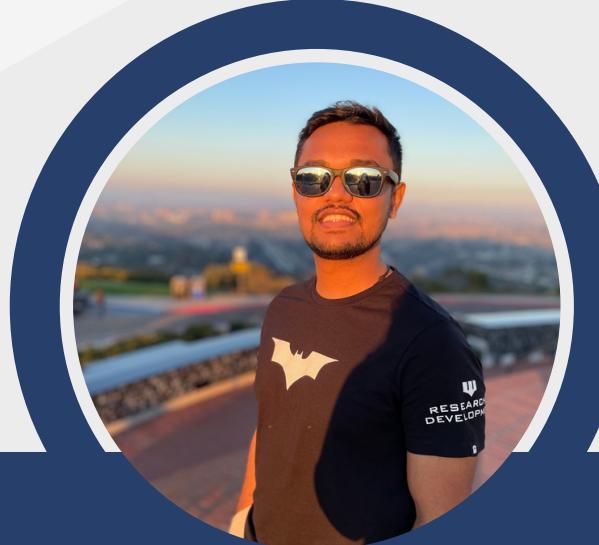
TEAM



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THANK YOU!

