Project: Hotel Management Data Analysis using SQL

Objective

To analyze hotel booking and operational data, uncovering insights on revenue, occupancy, guest preferences, and seasonal trends across Atliq Grands properties using SQL queries on three main tables: `fact_bookings`, `fact_aggregated_bookings`, and `properties`.

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1. Database and Table Setup

1.1 Database Creation

CREATE DATABASE IF NOT EXISTS hotel_management;

USE hotel_management;

```

A new database `hotel_management` is created to house all tables needed for the project.

# 1.2 Creating `fact_bookings` Table

CREATE TABLE IF NOT EXISTS fact_bookings (
```

```
    booking_id VARCHAR(255) PRIMARY KEY,
    property_id INT,
    booking_date DATE,
    check_in_date DATE,
    checkout_date DATE,
    no_guests INT,
    room_category VARCHAR(100),
    booking_platform VARCHAR(100),
    ratings_given FLOAT NULL,
    booking_status VARCHAR(50),
    revenue_generated DECIMAL(10, 2),
    revenue_realized DECIMAL(10, 2)
);
```

This table stores individual booking details, including booking and check-in dates, room category, guest count, booking platform, and revenue.

1.3 Creating `fact_aggregated_bookings` Table

```
CREATE TABLE IF NOT EXISTS fact_aggregated_bookings (
    property_id INT,
    check_in_date DATE,
    room_category VARCHAR(100),
```

```
    successful_bookings INT,
    capacity INT
);
```

This table contains aggregated booking data by date and room category, detailing successful bookings and property capacity.

1.4 Creating `properties` Table

```
CREATE TABLE IF NOT EXISTS properties (
    property_id INT PRIMARY KEY,
    property_name VARCHAR(100),
    category VARCHAR(50),
    city VARCHAR(50)
);
```

`properties` holds property details, including property names, categories, and locations.

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2. Data Insertion and Transformation

Data is loaded into tables with date fields transformed using `STR_TO_DATE` to standardize formats.

```
-- Insert and transform dates for temp bookings

INSERT IGNORE INTO fact_bookings (booking_id, property_id, booking_date, check_in_date, checkout_date, no_guests, room_category, booking_platform, ratings_given, booking_status, revenue_generated, revenue_realized)

SELECT

  booking_id,

  property_id,

  STR_TO_DATE(booking_date, '%d-%m-%Y'),

  STR_TO_DATE(check_in_date, '%d-%m-%Y'),

  STR_TO_DATE(checkout_date, '%d-%m-%Y'),

  no_guests,

  room_category,

  booking_platform,

  NULLIF(ratings_given, '') AS ratings_given,

  booking_status,

  revenue_generated,

  revenue_realized

FROM temp_bookings;

```

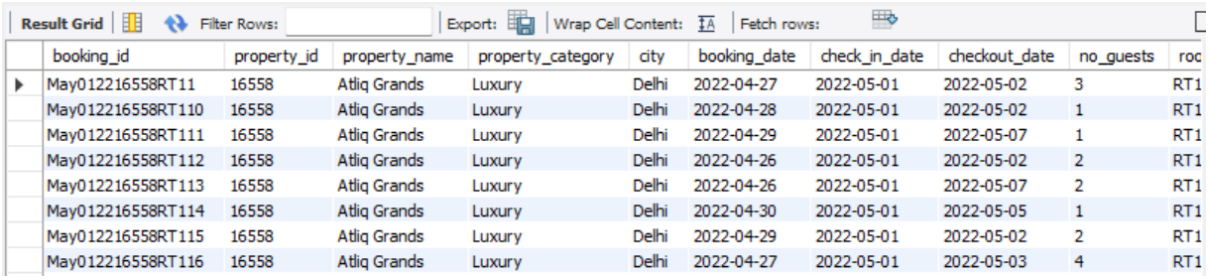
---

3. Analysis Queries and Results

3.1 Total Revenue per Property

Calculates each property's total revenue, helping identify top-performing properties.

```
SELECT
    p.property_name,
SUM(fb.revenue_realized) AS total_revenue
FROM
    fact_bookings fb
JOIN
    properties p ON fb.property_id = p.property_id
GROUP BY
    p.property_name
ORDER BY
    total_revenue DESC;
```



Result Grid | Filter Rows: | Export: | Wrap Cell Content: | Fetch rows:

booking_id	property_id	property_name	property_category	city	booking_date	check_in_date	checkout_date	no_guests	roc
May012216558RT11	16558	Atliq Grands	Luxury	Delhi	2022-04-27	2022-05-01	2022-05-02	3	RT1
May012216558RT110	16558	Atliq Grands	Luxury	Delhi	2022-04-28	2022-05-01	2022-05-02	1	RT1
May012216558RT111	16558	Atliq Grands	Luxury	Delhi	2022-04-29	2022-05-01	2022-05-07	1	RT1
May012216558RT112	16558	Atliq Grands	Luxury	Delhi	2022-04-26	2022-05-01	2022-05-02	2	RT1
May012216558RT113	16558	Atliq Grands	Luxury	Delhi	2022-04-26	2022-05-01	2022-05-07	2	RT1
May012216558RT114	16558	Atliq Grands	Luxury	Delhi	2022-04-30	2022-05-01	2022-05-05	1	RT1
May012216558RT115	16558	Atliq Grands	Luxury	Delhi	2022-04-29	2022-05-01	2022-05-02	2	RT1
May012216558RT116	16558	Atliq Grands	Luxury	Delhi	2022-04-27	2022-05-01	2022-05-03	4	RT1

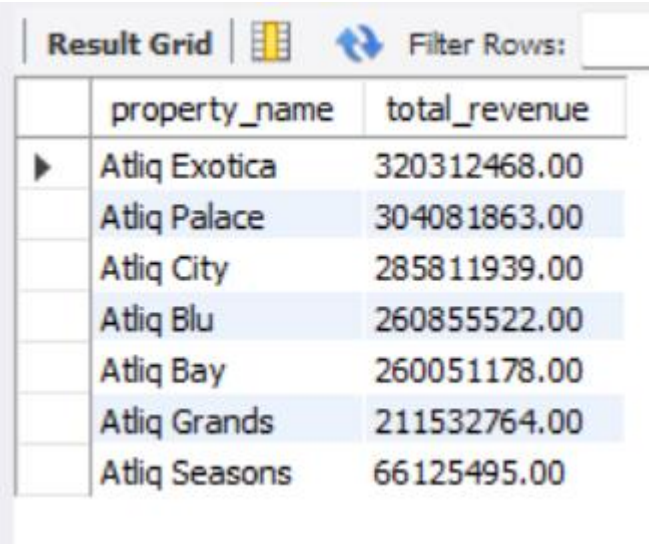
```

# 3.2 Occupancy Percentage by Property

Calculates occupancy rates by dividing successful bookings by capacity for each property.



```
SELECT
    p.property_name,
    (SUM(fab.successful_bookings) / SUM(fab.capacity)) * 100 AS occupancy_percentage
FROM
    fact_aggregated_bookings fab
JOIN
    properties p ON fab.property_id = p.property_id
GROUP BY
    p.property_name
ORDER BY
    occupancy_percentage DESC;
```
```



Result Grid | Filter Rows:

property_name	total_revenue
Atliq Exotica	320312468.00
Atliq Palace	304081863.00
Atliq City	285811939.00
Atliq Blu	260855522.00
Atliq Bay	260051178.00
Atliq Grands	211532764.00
Atliq Seasons	66125495.00

```

# 3.3 Average Rating per Property

Retrieves the average customer rating per property, indicating guest satisfaction levels.

```
SELECT
    p.property_name,
    AVG(fb.ratings_given) AS average_rating
FROM
    fact_bookings fb
JOIN
    properties p ON fb.property_id = p.property_id
WHERE
    fb.ratings_given IS NOT NULL
```
```

```
GROUP BY
    p.property_name
ORDER BY
    average_rating DESC;
```

property_name	occupancy_percentage
Atliq Blu	62.0163
Atliq Palace	59.9985
Atliq City	59.5096
Atliq Bay	58.4144
Atliq Exotica	57.2570
Atliq Grands	52.6031
Atliq Seasons	44.6212

```

# 3.4 Revenue and Occupancy Split by City and Property

Breaks down revenue and occupancy rates by city and property, showing regional performance.

```
SELECT
    p.city,
    p.property_name,
    SUM(fb.revenue_realized) AS total_revenue,
    (SUM(fab.successful_bookings) / SUM(fab.capacity)) * 100 AS occupancy_percentage
```
```

```
FROM
    fact_bookings fb
JOIN
    fact_aggregated_bookings fab ON fb.property_id = fab.property_id
AND fb.check_in_date = fab.check_in_date AND fb.room_category =
fab.room_category
JOIN
    properties p ON fb.property_id = p.property_id
GROUP BY
    p.city, p.property_name
ORDER BY
    total_revenue DESC;
```

Result Grid | Filter Rows:

property_name	average_rating
Atliq Blu	3.9596500820120286
Atliq Palace	3.749544626593807
Atliq Bay	3.7089285714285714
Atliq City	3.6947993159641888
Atliq Exotica	3.6192409173939515
Atliq Grands	3.099875501452483
Atliq Seasons	2.2948564593301435

```

# 3.5 Weekly Revenue Trends
```

This query identifies weekly revenue trends to detect seasonality and peak booking periods.

```
SELECT
    YEAR(fb.check_in_date) AS year,
    WEEK(fb.check_in_date) AS week_number,
    SUM(fb.revenue_realized) AS weekly_revenue
FROM
    fact_bookings fb
GROUP BY
    year, week_number
ORDER BY
    year, week_number;
```

city	property_name	total_revenue	occupancy_percentage
Mumbai	Atliq Exotica	637334964.00	69.0078
Mumbai	Atliq Palace	304533240.00	69.1726
Delhi	Atliq Palace	267407994.00	69.3636
Mumbai	Atliq City	263988648.00	55.5951
Bangalore	Atliq Bay	247330620.00	68.8367
Bangalore	Atliq City	245629035.00	68.7782
Mumbai	Atliq Grands	224192226.00	56.0689
Mumbai	Atliq Blu	221754936.00	68.7278

Bangalore	Atliq Blu	218890080.00	55.8345
Hyderabad	Atliq Bay	207767730.00	68.8260
Bangalore	Atliq Palace	205788015.00	55.8044
Mumbai	Atliq Seasons	198376485.00	46.7986
Hyderabad	Atliq City	183021600.00	69.1206
Bangalore	Atliq Exotica	180070380.00	55.9128
Delhi	Atliq Blu	173800200.00	68.8509
Delhi	Atliq Bay	169312710.00	55.5894
Hyderabad	Atliq Blu	168121350.00	68.7407
Delhi	Atliq City	164796534.00	56.1329
Bangalore	Atliq Grands	163483020.00	46.3374
Mumbai	Atliq Bay	155742474.00	46.5738
Hyderabad	Atliq Exotica	143532060.00	46.7677
Hyderabad	Atliq Grands	138739530.00	55.7577
Hyderabad	Atliq Palace	134516340.00	55.3429
Delhi	Atliq Grands	108183516.00	68.7680


```

# 3.6 Occupancy by Day Type (Weekend vs Weekday)

Calculates occupancy rates for weekends and weekdays, allowing for strategic pricing decisions.
```

```
SELECT
    p.property_name,
    CASE
        WHEN DAYOFWEEK(fab.check_in_date) IN (1, 7) THEN 'Weekend'
        ELSE 'Weekday'
    END AS day_type,
    (SUM(fab.successful_bookings) / SUM(fab.capacity)) * 100 AS occupancy_percentage
FROM
    fact_aggregated_bookings fab
JOIN
    properties p ON fab.property_id = p.property_id
GROUP BY
    p.property_name, day_type
ORDER BY
    p.property_name, day_type;
```

Atliq Bay	Weekday	51.9095
Atliq Bay	Weekend	74.0741
Atliq Blu	Weekday	54.9577
Atliq Blu	Weekend	79.0091
Atliq City	Weekday	52.6580

Atliq City	Weekend	76.0042
Atliq Exotica	Weekday	50.8384
Atliq Exotica	Weekend	72.7091
Atliq Grands	Weekday	46.6783
Atliq Grands	Weekend	66.8666
Atliq Palace	Weekday	53.3070
Atliq Palace	Weekend	76.1076
Atliq Seasons	Weekday	39.5559
Atliq Seasons	Weekend	56.8156

```

# 3.7 Booking Distribution by Platform

Determines which booking platforms guests use most frequently, informing targeted marketing.



```
SELECT
    fb.booking_platform,
    COUNT(fb.booking_id) AS total_bookings,
    (COUNT(fb.booking_id) / (SELECT COUNT(*) FROM fact_bookings)) * 100 AS booking_percentage
FROM
    fact_bookings fb
```
```

```
GROUP BY
    fb.booking_platform
ORDER BY
    total_bookings DESC;
```

booking_platform	total_bookings	booking_percentage
others	55066	40.9139
makeyourtrip	26898	19.9851
logtrip	14756	10.9637
direct online	13379	9.9406
tripster	9630	7.1551
journey	8106	6.0227
direct offline	6755	5.0189

```

---

**Conclusion**

**The analysis delivers a data-backed perspective on property performance, revenue drivers, guest preferences, and occupancy trends, empowering Atliq Grands with insights for enhancing revenue management, occupancy optimization, and marketing strategies.**

This data analysis can be instrumental in guiding Atliq Grands' decision-making in several strategic ways:
```

1. Revenue Maximization:

- High and Low-Performing Properties: By identifying properties that consistently generate high revenue, management can analyze their successful features and replicate these strategies across lower-performing properties. For example, luxury amenities at high-revenue locations might be expanded to mid-range properties to attract similar guest profiles.

- Platform-Based Marketing: The analysis of bookings by platform shows which channels guests prefer, allowing for targeted advertising. Atliq Grands could focus promotional budgets on high-traffic platforms, potentially negotiating exclusive deals or partnerships to increase direct bookings.

2. Occupancy Optimization:

- Capacity Management: Understanding occupancy trends by property and by day type (weekday vs. weekend) allows Atliq Grands to adjust room pricing dynamically. They might offer discounted rates on weekdays to boost occupancy or create special weekend packages to maximize revenue when demand is high.

- Seasonal and Weekly Trends: Insights into seasonal peaks and weekly revenue fluctuations allow for proactive resource allocation. Staff schedules, maintenance, and supply levels can be adjusted to match expected demand, ensuring efficient operations and reduced operational costs.

3. Customer Experience Enhancement:

- Guest Satisfaction Insights: The average rating analysis helps management identify properties where guest satisfaction may be lagging. By pinpointing common complaints or issues at these locations, Atliq Grands can address problems that impact ratings, such as

cleanliness, room comfort, or service. Focused improvements could drive better ratings, leading to higher customer loyalty and repeat bookings.

- Room Category Adjustments: Analyzing occupancy and revenue by room type provides data to fine-tune room offerings. For instance, if luxury rooms have consistently high occupancy, adding more rooms in this category or upgrading mid-tier rooms to luxury might align with demand.

4. Market Expansion and Localization:

- City-Specific Performance: Atliq Grands can assess which markets have the highest revenue and occupancy rates with detailed performance data across different cities. This can inform decisions on where to open new properties, or where existing properties might benefit from further investment. Properties in low-performing regions might require localized marketing strategies or tailored amenities to align with local guest preferences.

5. Operational Efficiency:

- Strategic Resource Allocation: Insights into capacity and booking patterns help Atliq Grands allocate resources more efficiently. For example, if certain cities have consistently lower occupancy, operational costs can be adjusted accordingly, perhaps by reducing inventory or staffing during off-peak seasons.

- Revenue Realization Analysis: With data on actual revenue realized versus generated, Atliq Grands can investigate any discrepancies, such as discounts or cancellations. Addressing these issues can improve revenue collection processes, leading to better financial health.

6. Improved Competitive Positioning:

- Targeted Service Improvements: By continually monitoring and analyzing guest feedback through ratings, Atliq Grands can differentiate itself by consistently enhancing guest experience areas that matter most, helping it to stand out in a competitive market.

- Localized Marketing and Pricing Strategies: Insights from city-specific data, seasonal trends, and platform preferences enable Atliq Grands to refine marketing campaigns. This tailored approach can boost brand presence in key markets, attract new customers, and retain current ones.

By leveraging data insights in these ways, Atliq Grands can make more data-driven, effective business decisions, leading to improved profitability, customer satisfaction, and a stronger market presence in the hospitality industry.