Information Technology Institute

Assiut Branch

Data Visualization Track – Intake 2

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Real Estate Analytical Project Documentation

1. Project Introduction

Project Overview:

The Real Estate Analytics Platform is designed to centralize, integrate, and analyze data related to property listings, customer leads, sales transactions, agent performance, and marketing campaigns. The platform aims to provide actionable insights that enable property companies or brokerages to optimize decision-making, improve marketing efficiency, and increase lead-to-sale conversion rates.

Business Goals:

Centralized Data Repository: Integrate data from multiple sources such as ,property listing platforms (e.g., PropertyFinder), sales records, and marketing campaign data into a single data warehouse.

Enhanced Business Intelligence: Provide interactive dashboards and reporting tools for management to visualize key metrics, trends, and relationships between agents, properties, leads, and campaigns.

Performance Monitoring: Track agent productivity, property sales, lead conversion rates, and marketing ROI to identify strengths and areas for improvement.

Data-Driven Decision Making: Enable executives and analysts to make informed decisions using historical and current data, forecasting trends, and predicting property demand.

Operational Efficiency: Automate data extraction, cleaning, and transformation (ETL) processes to ensure data accuracy, consistency, and timeliness.

2. Data Sources

2.1 Overview

The data used in this project was collected from a combination of web scraping, public datasets, and simulated (dummy) data to support the analysis of real estate sales, leads, and agent performance.

2.2 Source Datasets

Description:

Contains all information about available properties, including property type, size, city, neighborhood, price, listing status (active, sold, rented), and other attributes.

Source:

Collection Method: **Web Scraping:** For public platforms.

1. Property Finder Egypt
This platform provides detailed property listings across Egypt, including:

- Property type, location, and price
  Data was scraped using automated tools to extract structured information for analysis.

2. Fastbase – Egypt Real Estate Agencies Index
This source offers a directory of real estate agencies operating in Egypt. It was used to:

- Identify active agencies
- Analyze geographic distribution
- Cross-reference agent performance with listings

3. Kaggle Public Datasets

Kaggle was used to supplement the project with:

- Historical property sales data
- Lead generation datasets
- Agent performance metrics
  These datasets helped validate models and simulate real-world scenarios.

4. Dummy Data

Custom-generated data was used to:

- Simulate missing fields or enrich scraped data
- Test system performance and dashboard functionality
- Ensure consistency in data structure for modeling

3. Data Transformations

3.1 Data Cleaning

In this stage, we focused on preparing the raw real-estate data for reliable analysis. Our process included:

- **Removing duplicate rows** to avoid repeated leads, customers, or listings.
- **Handling missing values** by imputing logical defaults or removing unusable records.
- **Standardizing formats** for dates, phone numbers, emails, currency, and text fields.
- **Fixing inconsistent categories** in lead status, campaign type, and locations.
- **Validating business keys** for customers, agents, campaigns, and properties.

- **Correcting outliers** in price, commission, and sales records to maintain accuracy.
- **Resolving mismatched IDs** between leads, listings, and agents across all tables.
- **Dropping unnecessary columns** that do not contribute to analysis.
- **Renaming columns clearly** for better readability and consistency.

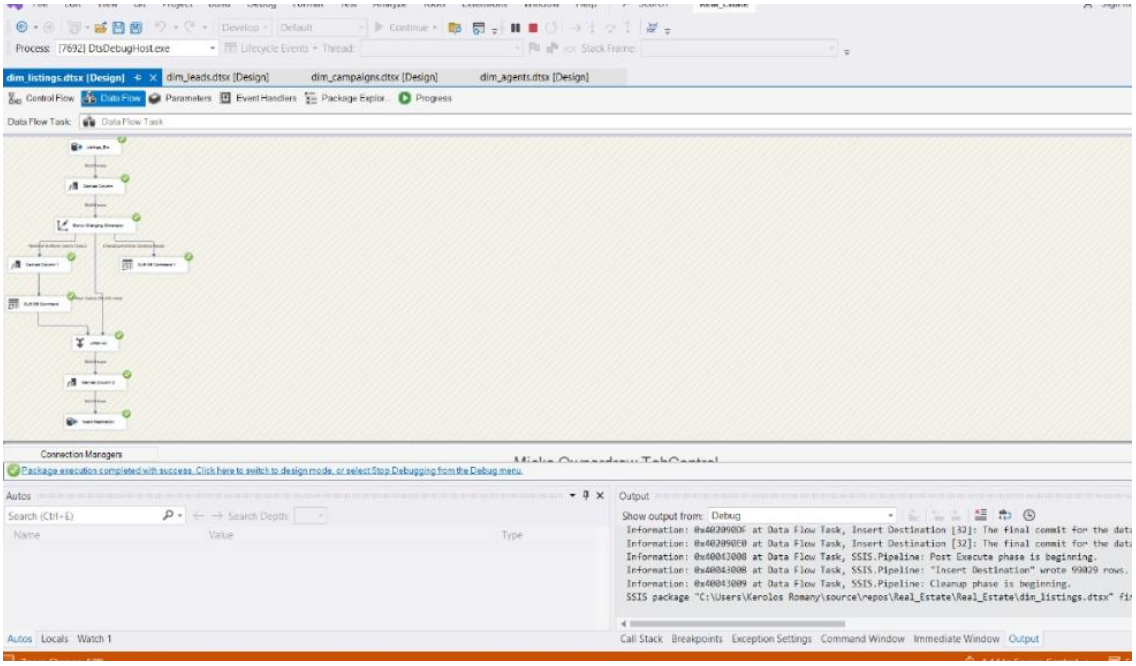
4. Modeling & Statistical Analysis – DB & DWH

4.1 SSIS

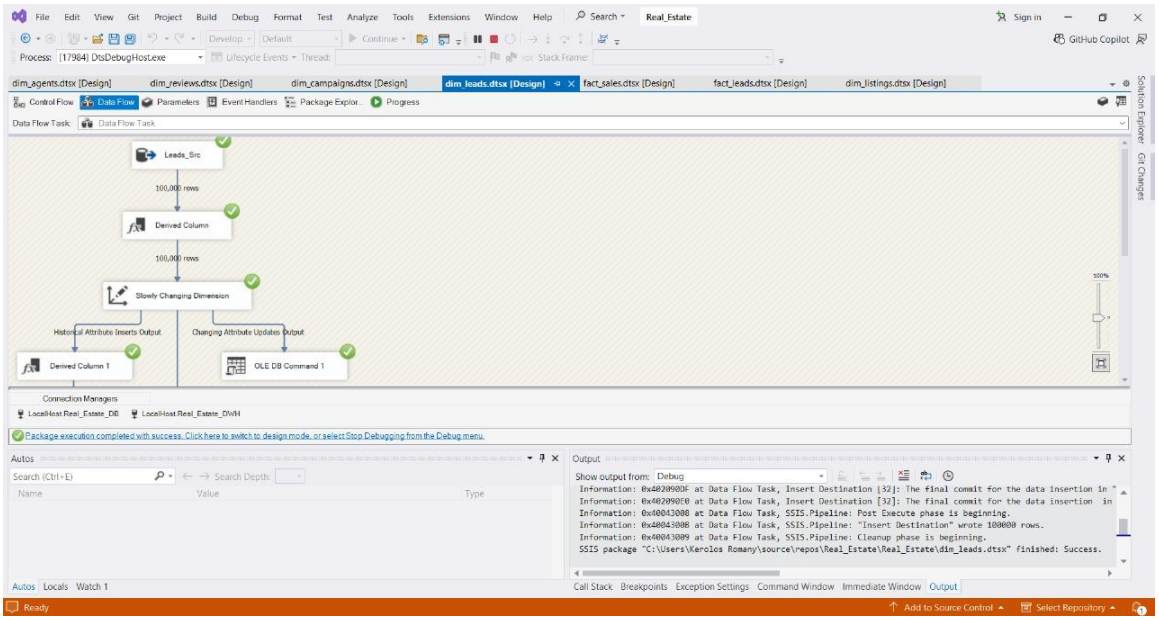
The Dimensional Model for the Real Estate Analytics project is designed as a Star Schema to facilitate analysis in Power BI or any other BI tool.

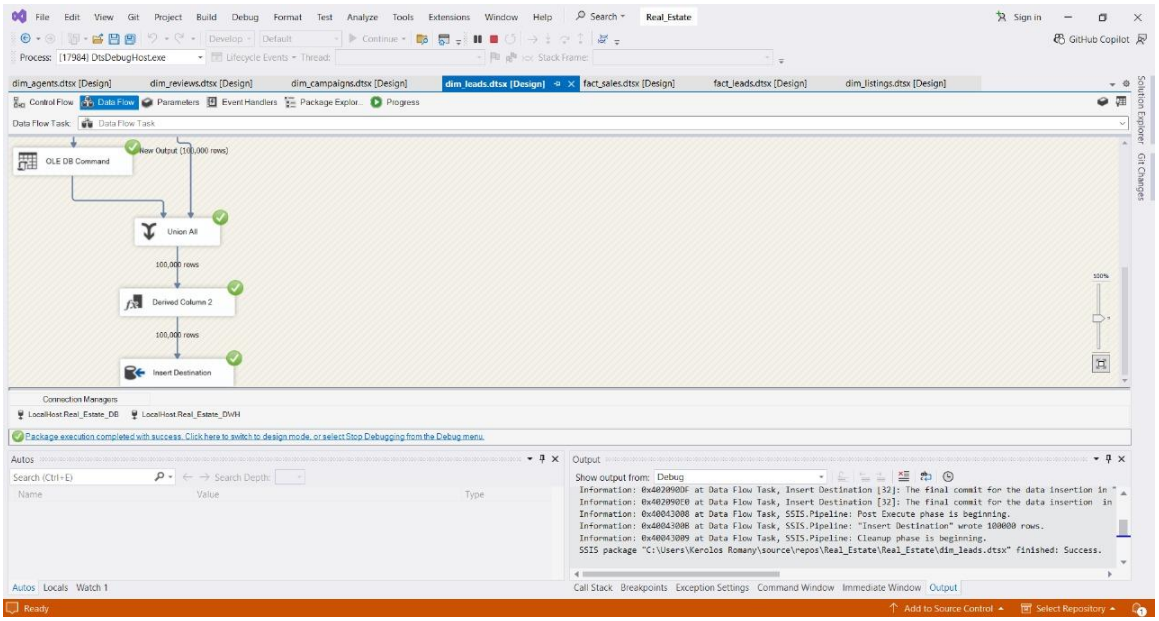
The model focuses on Fact Tables to measure events (Sales, Leads) and Dimension Tables to provide analytical properties (Leads, Agents, Reviews, Date, Campaigns, listings).

- Dim listing



- Dim leads


Leads_Src
100,000 rows
Derived Column
100,000 rows
Slowly Changing Dimension
Historical Attribute Inserts Output
Changing Attribute Updates Output
Derived Column 1
OLE DB Command 1
Connection Managers
LocalHost.Real_Estate_DB
LocalHost.Real_Estate_DWH
Package execution completed with success. Click here to switch to design mode, or select Stop Debugging from the Debug menu.
Information: 0x40209DF at Data Flow Task, Insert Destination [32]: The final commit for the data insertion in
Information: 0x40209E0 at Data Flow Task, Insert Destination [32]: The final commit for the data insertion in
Information: 0x40043008 at Data Flow Task, SSIS.Pipeline: Post Execute phase is beginning.
Information: 0x40043008 at Data Flow Task, SSIS.Pipeline: "Insert Destination" wrote 100000 rows.
Information: 0x40043009 at Data Flow Task, SSIS.Pipeline: Cleanup phase is beginning.
SSIS package "C:\Users\Kerolos Romany\source\repos\Real_Estate\Real_Estate\dim_leads.dtsx" finished: Success.


OLE DB Command
New Output (100,000 rows)
Union All
100,000 rows
Derived Column 2
100,000 rows
Insert Destination
Connection Managers
LocalHost.Real_Estate_DB
LocalHost.Real_Estate_DWH
Package execution completed with success. Click here to switch to design mode, or select Stop Debugging from the Debug menu.
Information: 0x40209DF at Data Flow Task, Insert Destination [32]: The final commit for the data insertion in
Information: 0x40209E0 at Data Flow Task, Insert Destination [32]: The final commit for the data insertion in
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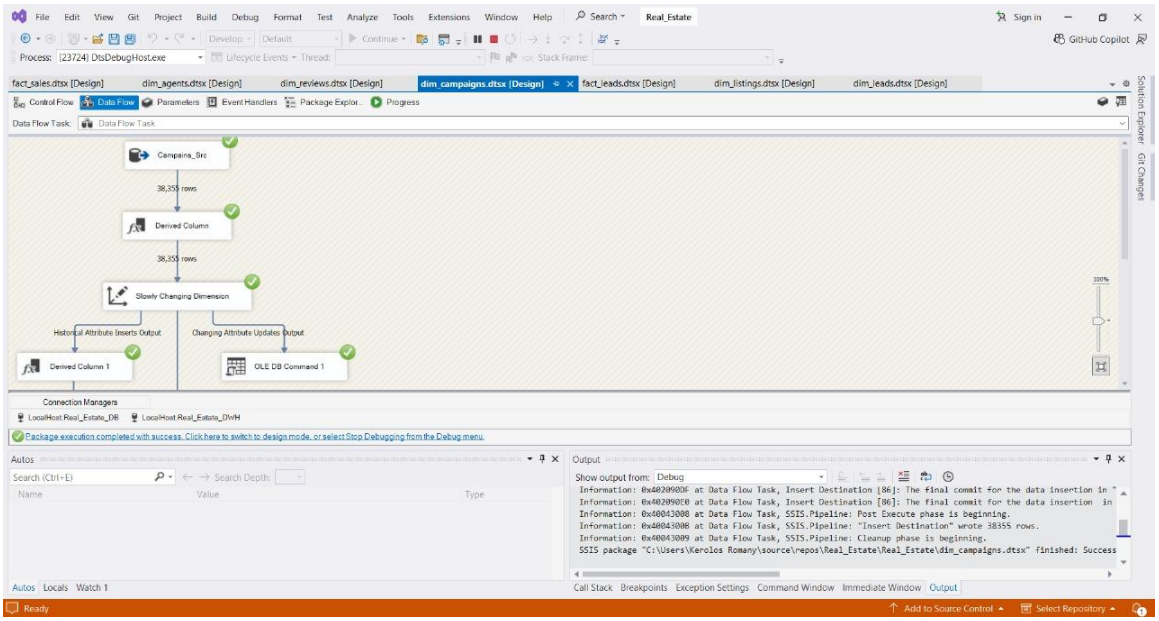
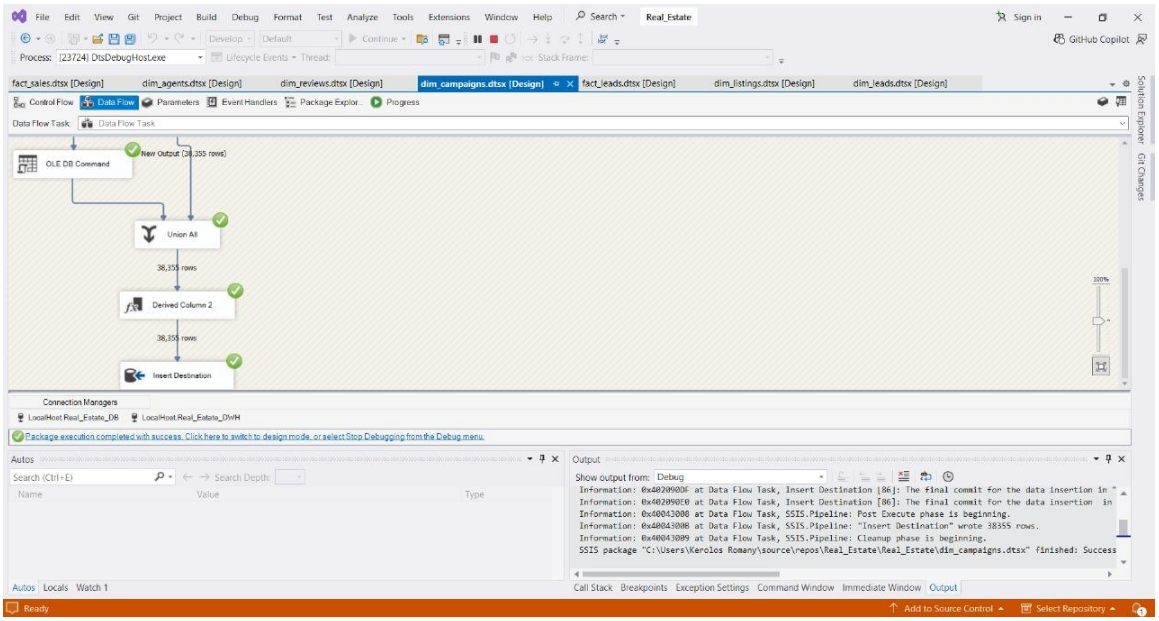
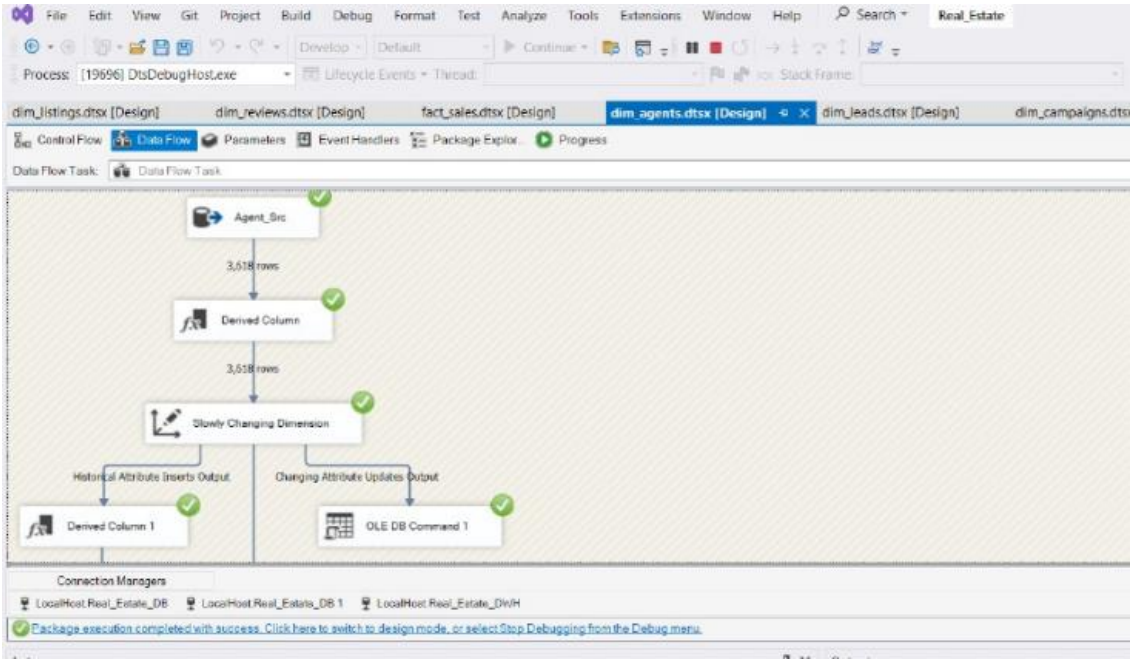
SSIS package "C:\Users\Kerolos Romany\source\repos\Real_Estate\Real_Estate\dim_leads.dtsx" finished: Success.

- Dim Campaigns

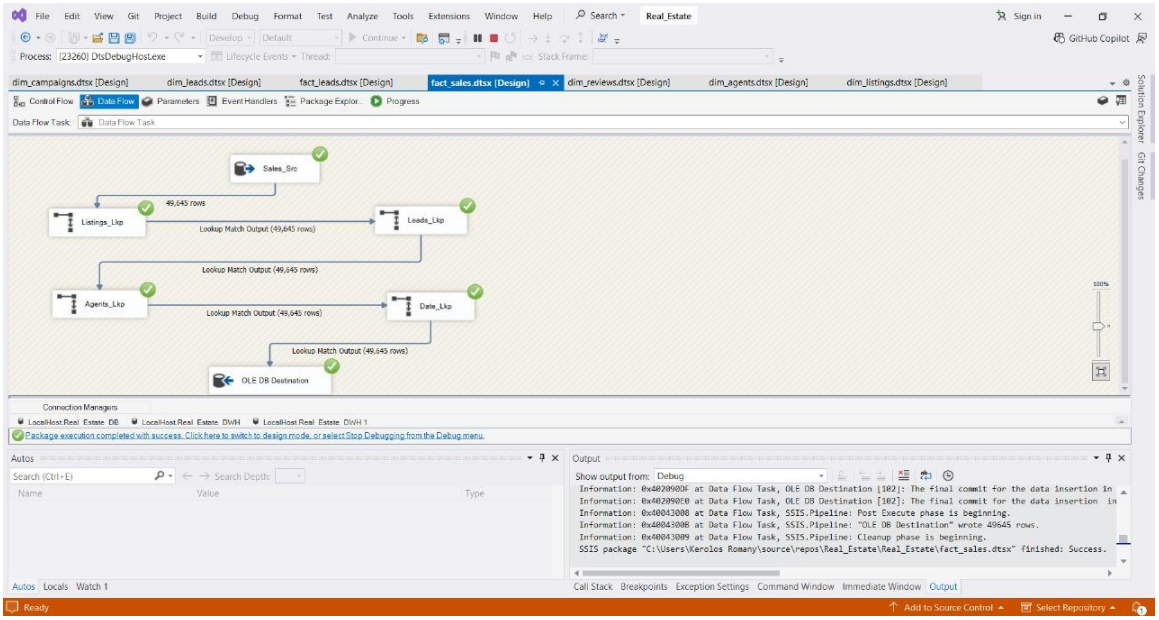




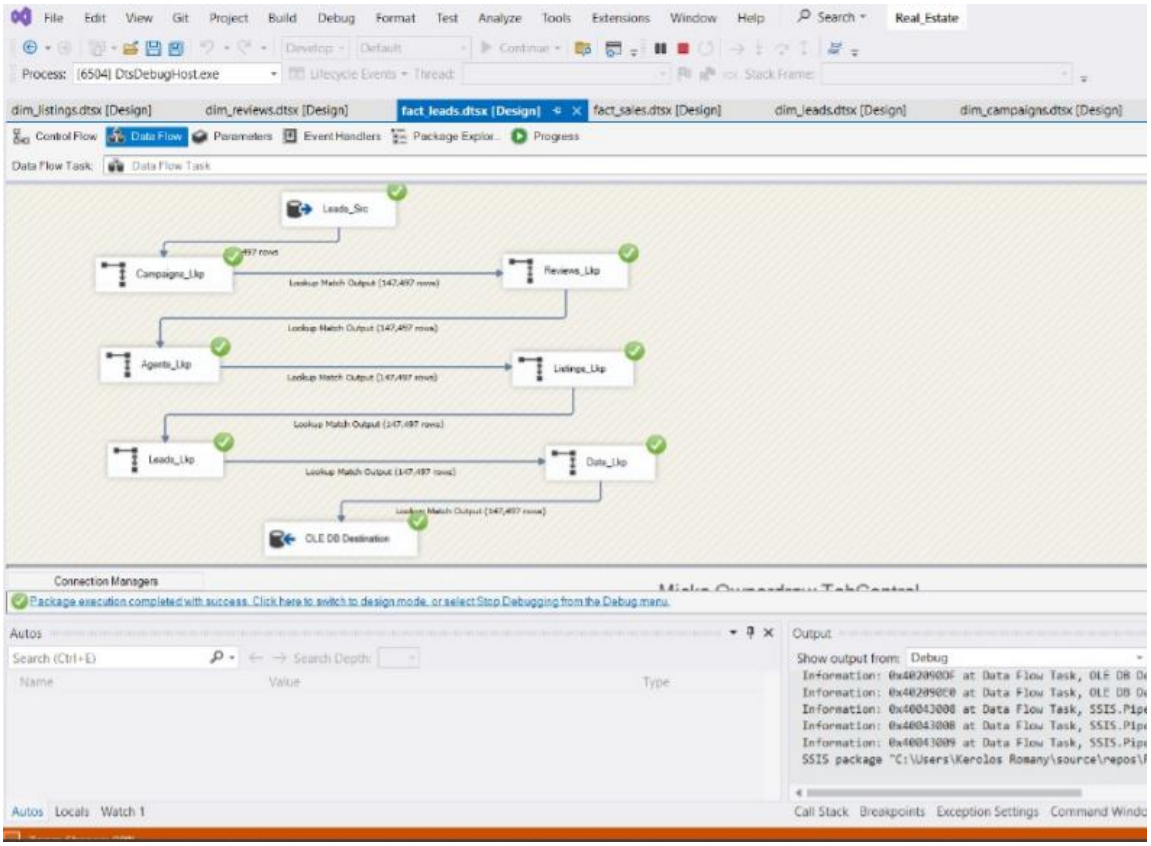
- Dim agents



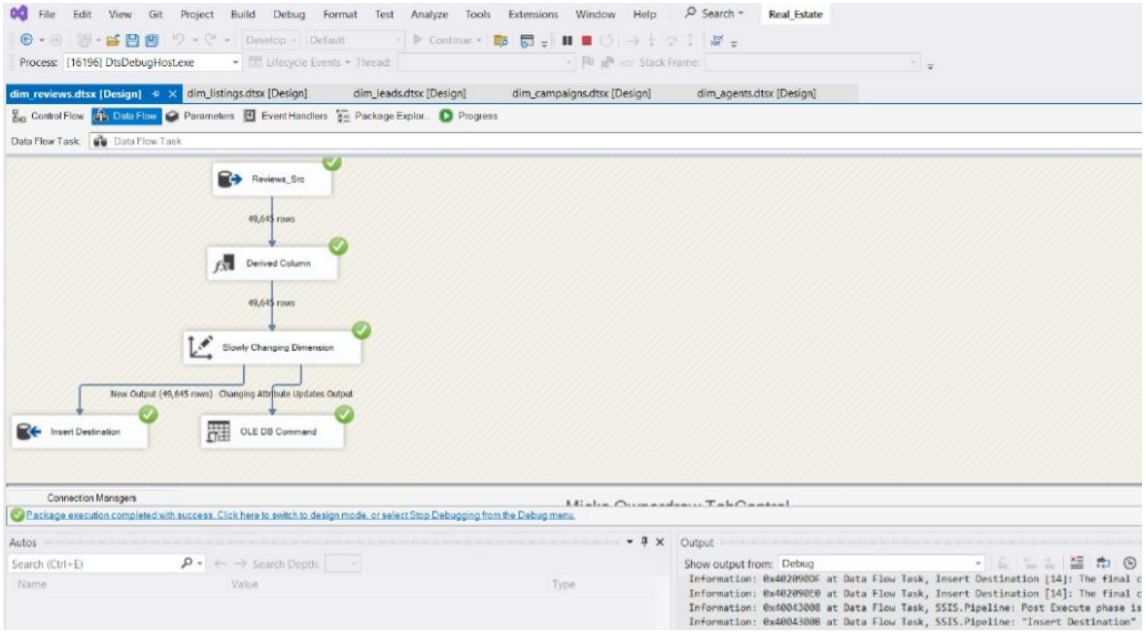
- Fact Sales



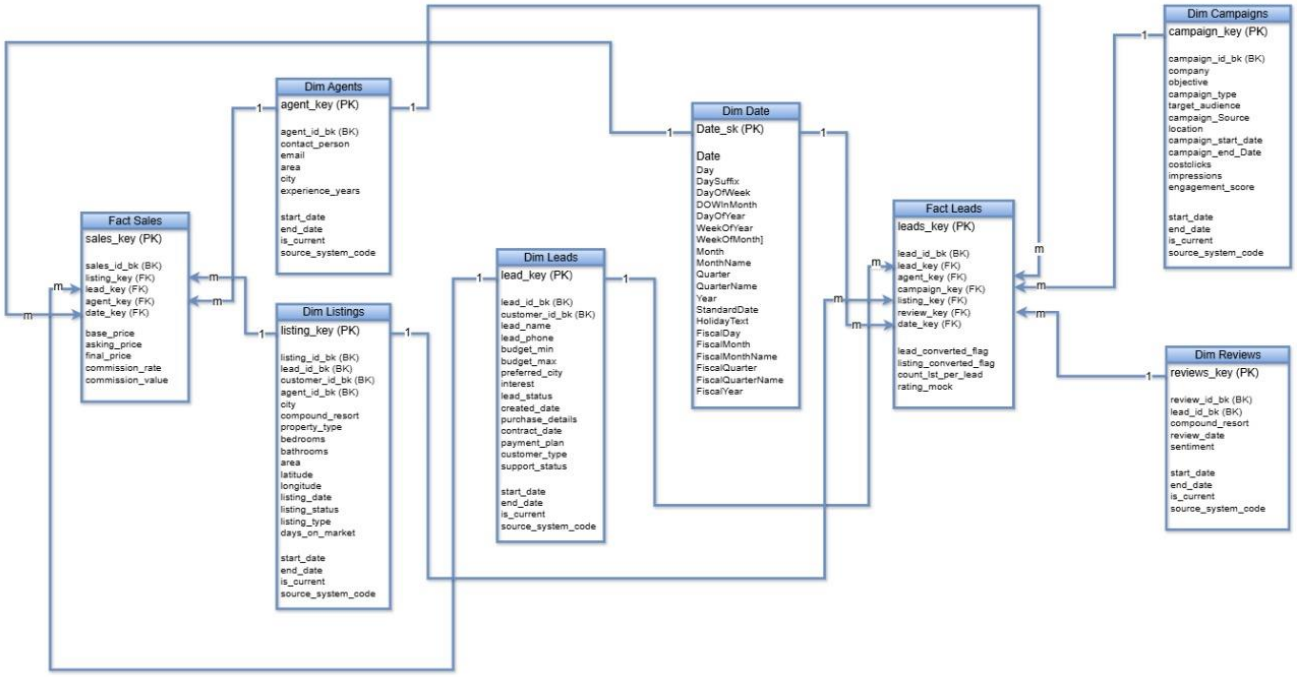
- Fact leads



- Dim Reviews

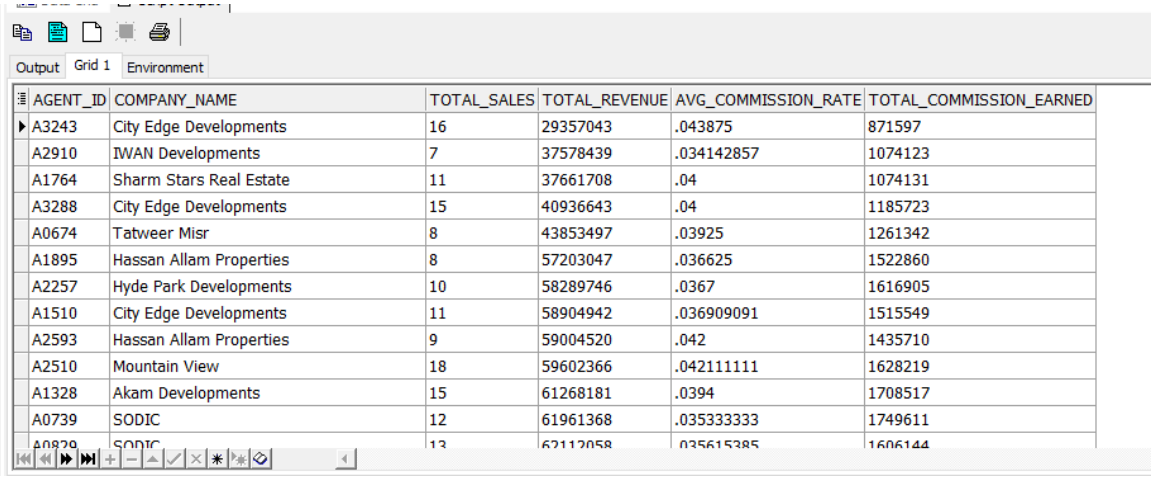


- Relationships



4.2 BI Queries

```
-- Shows top-performing agents by total sales and revenue.

SELECT

    a.agent_id,

    a.company_name,

    COUNT(s.sale_id) AS total_sales,

    SUM(s.sold_price) AS total_revenue,

    AVG(s.commission_rate) AS avg_commission_rate,

    SUM(s.commission_value) AS total_commission_earned

FROM Agents a

LEFT JOIN Sales s ON a.agent_id = s.agent_id

GROUP BY a.agent_id, a.company_name

 ORDER BY total_revenue , total_sales DESC;
```

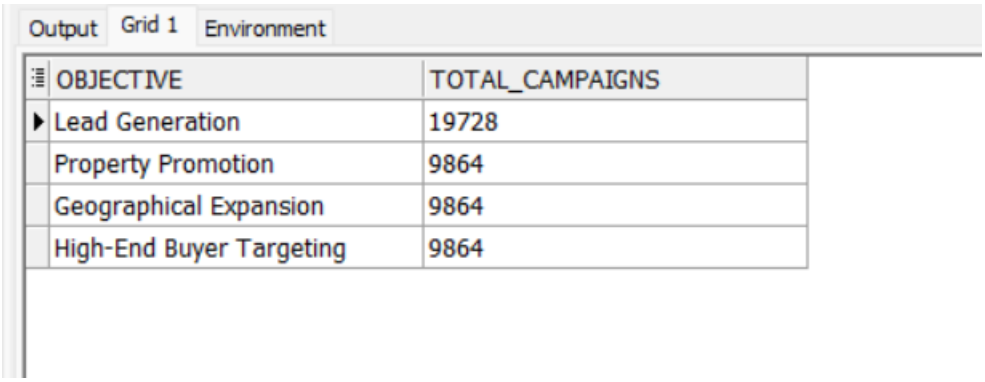


Output | Grid 1 | Environment

AGENT_ID	COMPANY_NAME	TOTAL_SALES	TOTAL_REVENUE	AVG_COMMISSION_RATE	TOTAL_COMMISSION_EARNED
A3243	City Edge Developments	16	29357043	.043875	871597
A2910	IWAN Developments	7	37578439	.034142857	1074123
A1764	Sharm Stars Real Estate	11	37661708	.04	1074131
A3288	City Edge Developments	15	40936643	.04	1185723
A0674	Tatweer Misr	8	43853497	.03925	1261342
A1895	Hassan Allam Properties	8	57203047	.036625	1522860
A2257	Hyde Park Developments	10	58289746	.0367	1616905
A1510	City Edge Developments	11	58904942	.036909091	1515549
A2593	Hassan Allam Properties	9	59004520	.042	1435710
A2510	Mountain View	18	59602366	.042111111	1628219
A1328	Akam Developments	15	61268181	.0394	1708517
A0739	SODIC	12	61961368	.035333333	1749611
A0829	SODIC	13	62112058	.035615385	1606144

- Insight *The most common campaign objectives*

```
SELECT Objective, COUNT(*) AS Total_Campaigns

FROM marketing_campaign

GROUP BY Objective

ORDER BY Total_Campaigns DESC;
```



Output | Grid 1 | Environment

OBJECTIVE	TOTAL_CAMPAIGNS
Lead Generation	19728
Property Promotion	9864
Geographical Expansion	9864
High-End Buyer Targeting	9864

- Insight: The number of leads (Leads) for each agent is calculated according to their status (Hot, Warm, Cold), and the agents are arranged in descending order according to the number of "hot" customers"

```
SELECT
    a.Agent_ID,
     COUNT(CASE WHEN l.Lead_Status = 'Hot' THEN 1 END) AS HotLeads,
    COUNT(CASE WHEN l.Lead_Status = 'Warm' THEN 1 END) AS WarmLeads,
    COUNT(CASE WHEN l.Lead_Status = 'Cold' THEN 1 END) AS ColdLeads
FROM Agents a
JOIN Leads l ON a.Agent_ID = l.Agent_ID
GROUP BY a.Agent_ID
ORDER BY HotLeads DESC;
```

Output | Grid 1 | Environment

AGENT_ID	HOTLEADS	WARMLEADS	COLDLEADS
A1320	33	16	0
A0870	29	15	0
A1770	27	12	0
A3588	27	22	0
A1806	26	16	0
A1230	26	26	0
A1014	25	12	0
A3300	25	18	0
A0366	25	22	0
A1212	24	19	0
A0114	24	15	0
A0582	24	15	0
A2400	24	14	0
A0258	24	12	0
A0492	23	17	0
A2580	23	21	0
A2940	23	21	0
A0528	23	13	0
A3084	23	12	0

```
-- Insight Filter campaigns by target audience and source

SELECT campaign_id, Company_name, Objective, Engagement_Score

FROM marketing_campaign

WHERE Target_Audience = 'Women 25-34'

  AND Campaign_Source = 'Instagram';
```

Output | Grid 1 | Environment

CAMPAIGN_ID	COMPANY_NAME	OBJECTIVE	ENGAGEMENT_SCORE
M00017	Misr Italia Properties	Geographical Expansion	10
M00216	IWAN Developments	Lead Generation	6
M00227	Q Developments	Geographical Expansion	7
M00232	Palm Hills Developments	Geographical Expansion	9
M00287	Orascom Development	Geographical Expansion	2
M00099	City Edge Developments	Property Promotion	8
M00105	Hyde Park Developments	Lead Generation	5
M00402	Talaat Moustafa Group (TMG)	Geographical Expansion	6
M00646	Hyde Park Developments	Lead Generation	5
M00670	Minka Developments	Lead Generation	9
M00736	Hyde Park Developments	Lead Generation	1
M00467	Al Marasem Development	Geographical Expansion	7
M00488	City Edge Developments	High-End Buyer Targeting	8
M00491	Q Developments	Lead Generation	1
M00592	The Waterway Developments	Geographical Expansion	1
M00608	Akam Developments	High-End Buyer Targeting	4
M00317	Misr Italia Properties	Geographical Expansion	7
M00328	Minka Developments	High-End Buyer Targeting	4

```
-- Insight Displays the top 5 agents from a table in order of years of experience from highest to lowest

SELECT *

FROM (
```

```
    SELECT * FROM Agents ORDER BY EXPERIENCE_YEARS DESC
)
WHERE ROWNUM <= 5;
```

```
-- Insight: Number of Agents in Each City
SELECT city, COUNT(*) AS agent_count
FROM Agents
GROUP BY city
ORDER BY agent_count DESC;
```

Output | Grid 1 | Environment

CITY	AGENT_COUNT
Cairo	3216
Sharm Elsheikh	201
Hurghada	201

```
-- Insight Top 5 Agents by Total Commission
SELECT agent_id, total_commission
FROM (
    SELECT agent_id, SUM(commission_value) AS total_commission
    FROM Sales
    GROUP BY agent_id
    ORDER BY total_commission DESC
)
WHERE ROWNUM <= 5;
```

Output | Grid 1 | Environment

AGENT_ID	TOTAL_COMMISSION
A1260	10085553
A2063	8029287
A0909	6811805
A0570	6798478
A3329	6631183

```
-- Insight Number of properties by property type

SELECT property_type, COUNT(*) AS total_listings

FROM Listings

GROUP BY property_type

ORDER BY total_listings DESC;
```

Output | Grid 1 | Environment

PROPERTY_TYPE	TOTAL_LISTINGS
Apartment	51359
Villa	17113
Chalet	10404
Townhouse	6135
Twin House	3999
Duplex	3160
Penthouse	2881
Studio	2369
iVilla	948
Hotel Apartment	267
Cabin	137
Roof	71
Palace	70
Land	52
Whole Building	34
Bungalow	15
Full Floor	5
Bulk Sale Unit	4
Half Floor	4
Bulk Rent Unit	2

```
-- Insight Average price required by property type

SELECT property_type, AVG(asking_price) AS avg_asking_price

FROM Listings

GROUP BY property_type
```

```
ORDER BY avg_asking_price DESC;
```

Output | Grid 1 | Environment

PROPERTY_TYPE	AVG_ASKING_PRICE
Palace	128323831
Land	112474176
Whole Building	55033061.2
Villa	30339974.6
Full Floor	29049103
Hotel Apartment	23129173.2
Bulk Sale Unit	20954223.3
Twin House	20001942.5
Townhouse	16726659.8
Cabin	15152066.8
Chalet	13087083.3
Penthouse	11549397.9
Bungalow	10761813.3
Half Floor	10595605.3
iVilla	9620756.23
Duplex	9402283.16
Apartment	5786293.54
Studio	2853085.34
Roof	1711199.99
Bulk Rent Unit	210551.5

```
-- Insight Total sales by city

SELECT l.city, COUNT(*) AS total_sales

FROM Sales s

JOIN Listings l ON s.listing_id = l.listing_id

GROUP BY l.city

ORDER BY total_sales DESC;
```

Output | Grid 1 | Environment

CITY	TOTAL_SALES
Cairo	3457
Giza	2178
Red Sea	915
Alexandria	794
North Coast	779

```
-- Insight Agent Performance by Number of Sales
SELECT agent_id, COUNT(*) AS sales_count
FROM Sales
GROUP BY agent_id
ORDER BY sales_count DESC;
```

Output | Grid 1 | Environment

AGENT_ID	SALES_COUNT
A0384	16
A2832	13
A2346	11
A3282	10
A2508	10
A1842	9
A0320	9
A2581	8
A2940	8
A1950	8

```
-- Insight Average commission percentage per agent
SELECT agent_id, AVG(commission_rate) AS avg_rate
FROM Sales
GROUP BY agent_id
ORDER BY avg_rate DESC;
```

Output | Grid 1 | Environment

AGENT_ID	AVG_RATE
A2030	.06
A3576	.06
A0927	.06
A3589	.06
A0067	.06
A3253	.055
A0248	.055
A1238	.055

```
-- Insight Properties that have stayed the longest on the market
SELECT listing_id, days_on_market
FROM Listings
WHERE days_on_market IS NOT NULL
```

```
ORDER BY days_on_market DESC;
```

Output | Grid 1 | Environment

LISTING_ID	DAYS_ON_MARKET
LST-65700	379
LST-66960	376
LST-71852	374
LST-67106	374
LST-67684	372
LST-67295	372
LST-66652	372
LST-73198	371
LST-68332	371
LST-68645	368
LST-66044	368
LST-68173	366
LST-73597	366
LST-40317	365
LST-67344	364
LST-65313	364
LST-65753	363
LST-67007	362

```
-- Insight The most common type of property in each city

SELECT city, property_type, COUNT(*) AS count

FROM Listings

GROUP BY city, property_type

ORDER BY city, count DESC;
```

Output | Grid 1 | Environment

CITY	PROPERTY_TYPE	COUNT
Alexandria	Apartment	7914
Alexandria	Villa	463
Alexandria	Duplex	149
Alexandria	Townhouse	49
Alexandria	Twin House	21
Alexandria	Chalet	18
Alexandria	Penthouse	9
Alexandria	Whole Building	4
Alexandria	Studio	4
Alexandria	Palace	4
Alexandria	iVilla	4
Alexandria	Full Floor	1
Cairo	Apartment	26459
Cairo	Villa	5648
Cairo	Townhouse	1984
Cairo	Duplex	1605
Cairo	Twin House	1302
Cairo	Penthouse	1233
Cairo	Studio	786
Cairo	iVilla	710
Cairo	Hotel Apartment	89

```
-- Insight Total revenue per agent

SELECT agent_id, SUM(sold_price) AS total_revenue

FROM Sales

GROUP BY agent_id

ORDER BY total_revenue DESC;
```

Output | Grid 1 | Environment

AGENT_ID	TOTAL_REVENUE
A1834	657149582
A1260	442513099
A2616	431353964
A2063	363139470
A3223	347771992
A0570	307202461
A0909	307179346
A0328	300784134
A3329	300446930
A1441	273550419
A2998	268465955
A1007	266581542
A1599	265220821
A2789	254126844
A0532	249818108
A3162	246862097
A2788	246095659

```
-- Insight Average final price by property type

SELECT property_type, AVG(final_price) AS avg_final_price

FROM Listings

GROUP BY property_type

ORDER BY avg_final_price DESC;
```

Output | Grid 1 | Environment

PROPERTY_TYPE	AVG_FINAL_PRICE
Palace	128185738
Land	112337516
Whole Building	54894226.5
Villa	30209089.5
Full Floor	28904113
Hotel Apartment	22982194.7
Bulk Sale Unit	20799132
Twin House	19873725.1
Townhouse	16593879.2
Cabin	15008301.8
Chalet	12945487.4
Penthouse	11429093.0
Bungalow	10623314
Half Floor	10482859
iVilla	9504416.17
Duplex	9301548.73
Apartment	5692889.43
Studio	2785774.15
Roof	1665800.54
Bulk Rent Unit	188889

```
-- Insight Number of properties sold per agent

SELECT agent_id, COUNT(*) AS sold_count

FROM Listings
```

```
WHERE listing_status = 'Sold'

GROUP BY agent_id

ORDER BY sold_count DESC;
```

Output | Grid 1 | Environment

AGENT_ID	SOLD_COUNT
A0564	67
A3570	60
A0636	60
A0438	58
A0834	58
A1770	57
A2706	56
A0618	56
A1230	55
A2904	55
A2598	55
A2940	55
A3300	55
A0132	54
A1824	54
A0654	53
A1860	53
A3444	53
A0384	52
A2148	52
A1698	51

```
--Most Compounds/Resorts by Number of Listed Properties

SELECT compound_resort, COUNT(*) AS listing_count

FROM Listings

GROUP BY compound_resort

ORDER BY listing_count DESC;
```

Output Grid 1 Environment

COMPOUND_RESORT	LISTING_COUNT
Mivida	2768
Eastown	1798
Lake View Residence	1605
Mangroovy Residence	1582
O West	1576
Marassi	1542
Villette	1496
Mesca	1439
Mountain View iCity	1143
Privado	1133
Cairo Festival City	1125
Mountain View Hyde Park	1025
Palm Hills New Cairo	938
New Giza	931
El Rehab Extension	893
Mountain View iCity October	887
Sarayat Al Maadi	821
Badya Palm Hills	762
City Gate	741
Park Side Residence	684
Moon Residences	681
Westown	652

```
-- Insight Number of leads per case

SELECT

    Lead_Status,

    COUNT(*) AS LeadCount

FROM Leads

GROUP BY Lead_Status

ORDER BY LeadCount DESC;
```

Output Grid 1 Environment

LEAD_STATUS	LEADCOUNT
New	20085
Contacted	20064
Lost	19957
Warm	19952
Hot	19942

```
-- Insight Agents with more than 10 "Hot" leads

SELECT
```

```
    a.Agent_ID,
    COUNT(l.Lead_ID) AS HotLeadCount
FROM Agents a
JOIN Leads l ON a.Agent_ID = l.Agent_ID
WHERE l.Lead_Status = 'Hot'
GROUP BY a.Agent_ID
HAVING COUNT(l.Lead_ID) > 10
ORDER BY HotLeadCount DESC;
```

Output | Grid 1 | Environment

AGENT_ID	HOTLEADCOUNT
A1320	33
A0870	29
A1770	27
A3588	27
A1806	26
A1230	26
A1014	25
A3300	25
A0366	25
A1212	24
A0114	24
A0582	24
A2400	24
A0258	24

```
--Agents who have not made any sales
SELECT a.Agent_ID, a.Contact_Person
FROM Agents a
LEFT JOIN Sales s ON a.Agent_ID = s.Agent_ID
WHERE s.Sale_ID IS NULL;
```

Output | Grid 1 | Environment

AGENT_ID	CONTACT_PERSON
A2343	Hany Abdelwahab
A2945	Ibrahim Elhennawy
A1102	Abbas Helmy
A1583	Mohamed Sabry
A3060	Omar Salah
A0828	Omar Salah
A3549	Hany Abdelwahab
A0286	Mohamed Elsayed
A1656	Omar Salah
A1848	Karim Fahim
A1886	Mohammad Degheady
A1863	Ahmed Bushra
A1549	Maher Hakeim
A3272	Mohammad Degheady

```
-- #I Insight: Helps identify which property types sell fastest and for how much.

 SELECT

   property_type,

   AVG(asking_price) AS avg_asking_price,

   AVG(final_price) AS avg_final_price,

   AVG(days_on_market) AS avg_days_on_market

FROM Listings

GROUP BY property_type

ORDER BY avg_final_price DESC;
```

Output | Grid 1 | Environment

PROPERTY_TYPE	AVG_ASKING_PRICE	AVG_FINAL_PRICE	AVG_DAYS_ON_MARKET
Palace	128323831	128185738	57.6842105
Land	112474176	112337516	64.6086957
Whole Building	55033061.2	54894226.5	28.1333333
Villa	30339974.6	30209089.5	38.1936272
Full Floor	29049103	28904113	21.5
Hotel Apartment	23162670.4	23015487.5	63.1171875
Bulk Sale Unit	20954223.3	20799132	17
Twin House	20001305.4	19873015.9	41.9116751
Townhouse	16763785.0	16630919.1	45.4633244
Cabin	15152066.8	15008301.8	116.259740
Chalet	13087083.3	12945487.4	124.263309
Penthouse	11540653.1	11420308.7	35.6436700

```sql
--Insight: Geographic Performance by City

SELECT

    l.city,

    COUNT(s.sale_id) AS total_sales,

    SUM(s.sold_price) AS total_revenue,

    AVG(s.commission_value) AS avg_commission,

    COUNT(DISTINCT l.listing_id) AS total_listings

FROM Sales s

JOIN Listings l ON s.listing_id = l.listing_id

JOIN Agents a ON s.agent_id = a.agent_id

GROUP BY l.city

ORDER BY total_revenue DESC;
```

Script Output

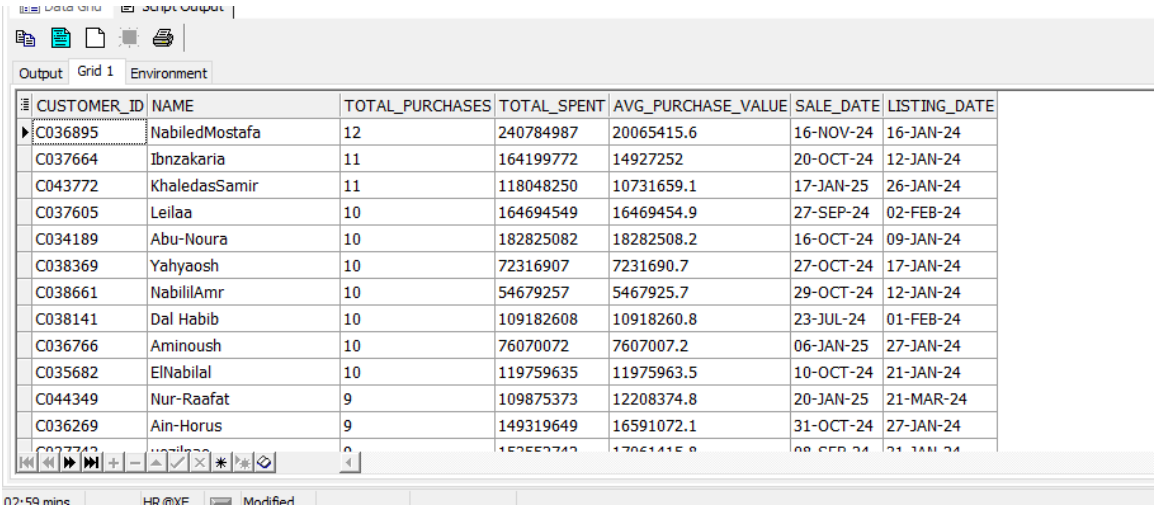
Data Grid | Script Output

Output | Grid 1 | Environment

CITY	TOTAL_SALES	TOTAL_REVENUE	AVG_COMMISSION	TOTAL_LISTINGS
Cairo	35152	3.3634E+11	237501.776	35152
Giza	21851	2.6227E+11	290272.864	21851
North Coast	11399	2.4579E+11	551650.438	11399
Red Sea	11049	1.8273E+11	423645.412	11049
Alexandria	7643	5.5903E+10	196455.429	7643

```sql
--Insight: Repeat Customers

SELECT

    c.customer_id,

    c.name,

    COUNT(s.sale_id) AS total_purchases,

    SUM(s.sold_price) AS total_spent,

    AVG(s.sold_price) AS avg_purchase_value,

    Max(s.sale_date) AS sale_date,
```

```
    MIN(l.LISTING_date) AS listing_date
FROM Customers c
JOIN Sales s
    ON c.customer_id = s.customer_id
JOIN Listings l
    ON s.listing_id = l.listing_id
GROUP BY c.customer_id, c.name
HAVING COUNT(s.sale_id) > 1
ORDER BY total_purchases DESC;
```



Output | Grid 1 | Environment

CUSTOMER_ID	NAME	TOTAL_PURCHASES	TOTAL_SPENT	AVG_PURCHASE_VALUE	SALE_DATE	LISTING_DATE
C036895	NabiledMostafa	12	240784987	20065415.6	16-NOV-24	16-JAN-24
C037664	Ibnzakaria	11	164199772	14927252	20-OCT-24	12-JAN-24
C043772	KhaledasSamir	11	118048250	10731659.1	17-JAN-25	26-JAN-24
C037605	Leilaa	10	164694549	16469454.9	27-SEP-24	02-FEB-24
C034189	Abu-Noura	10	182825082	18282508.2	16-OCT-24	09-JAN-24
C038369	Yahyaosh	10	72316907	7231690.7	27-OCT-24	17-JAN-24
C038661	NabililAmr	10	54679257	5467925.7	29-OCT-24	12-JAN-24
C038141	Dal Habib	10	109182608	10918260.8	23-JUL-24	01-FEB-24
C036766	Aminoush	10	76070072	7607007.2	06-JAN-25	27-JAN-24
C035682	ElNabilal	10	119759635	11975963.5	10-OCT-24	21-JAN-24
C044349	Nur-Raafat	9	109875373	12208374.8	20-JAN-25	21-MAR-24
C036269	Ain-Horus	9	149319649	16591072.1	31-OCT-24	27-JAN-24

```
-- City × Agent × Loyal Customers Insight
WITH loyal_customers AS (
    SELECT  c.customer_id
    FROM Customers c
    JOIN Sales s ON c.customer_id = s.customer_id
    GROUP BY c.customer_id
        HAVING COUNT(s.sale_id) > 1
)
SELECT
    a.city,
    a.agent_id,
    a.COMPANY_NAME AS COMPANY_NAME,
    COUNT(DISTINCT lc.customer_id) AS loyal_customers_count,
```

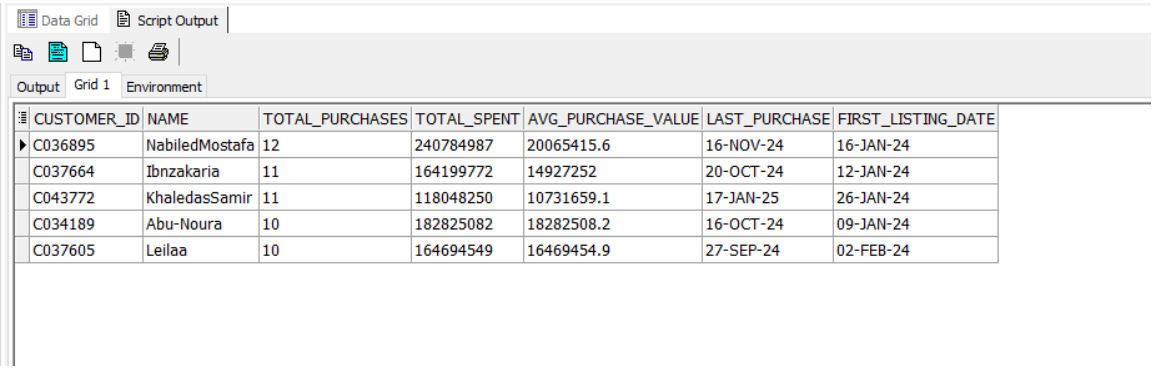
```
    COUNT(s.sale_id) AS total_sales_to_loyals,
    SUM(s.sold_price) AS total_revenue_from_loyals,
    AVG(s.commission_value) AS avg_commission
FROM Sales s
JOIN Agents a ON s.agent_id = a.agent_id
JOIN loyal_customers lc ON s.customer_id = lc.customer_id
GROUP BY a.city, a.agent_id, a.COMPANY_NAME
ORDER BY a.city, total_revenue_from_loyals DESC;
```

Output | Grid 1 | Environment

CITY	AGENT_ID	COMPANY_NAME	LOYAL_CUSTOMERS_COUNT	TOTAL_SALES_TO_LOYALS	TOTAL_REVENUE_FROM_LOYALS	AVG_COMMISSION
Cairo	A1112	Minka Developments	28	29	1428795328	1118950.52
Cairo	A1070	Mountain View	23	33	1331489833	929984.030
Cairo	A0938	Palm Hills Developments	18	27	1304603766	324229
Cairo	A2133	Q Developments	19	27	1213338957	195639.963
Cairo	A3130	City Edge Developments	17	22	1172409294	1486456.5
Cairo	A0867	Mountain View	24	32	1163900450	567072.063
Cairo	A2779	Misr Italia Properties	23	27	1049534380	620322.296
Cairo	A0703	Hassan Allam Properties	24	31	1001531517	206855.806
Cairo	A3437	Q Developments	19	23	918415409	174685.565
Cairo	A0508	New Giza	15	19	902908479	1072550.16
Cairo	A3289	Emaar Misr	17	19	886684840	1054569.16
Cairo	A0181	Akam Developments	18	19	875889592	1058997.79
Cairo	A2721	Tatweer Misr	16	16	849543526	1196572.13

```
-- Insight: Top 5 Loyal Customers ()
SELECT *
FROM (
    SELECT
        c.customer_id,
        c.name,
        COUNT(s.sale_id) AS total_purchases,
        SUM(s.sold_price) AS total_spent,
        AVG(s.sold_price) AS avg_purchase_value,
        MAX(s.sale_date) AS last_purchase,
        MIN(l.listing_date) AS first_listing_date
    FROM Customers c
    JOIN Sales s
        ON c.customer_id = s.customer_id
    JOIN Listings l
        ON s.listing_id = l.listing_id
```

```
    GROUP BY c.customer_id, c.name
    HAVING COUNT(s.sale_id) > 1
    ORDER BY total_purchases DESC, total_spent DESC
)
WHERE ROWNUM <= 5;
```

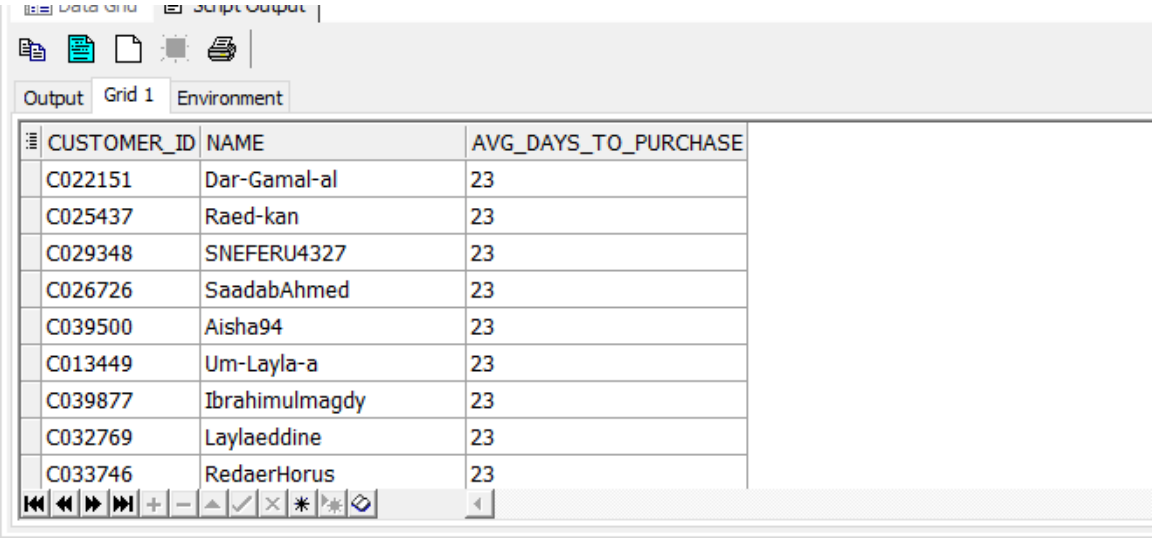


Data Grid | Script Output

Output | Grid 1 | Environment

CUSTOMER_ID	NAME	TOTAL_PURCHASES	TOTAL_SPENT	AVG_PURCHASE_VALUE	LAST_PURCHASE	FIRST_LISTING_DATE
C036895	NabiledMostafa	12	240784987	20065415.6	16-NOV-24	16-JAN-24
C037664	Ibnzakaria	11	164199772	14927252	20-OCT-24	12-JAN-24
C043772	KhaledasSamir	11	118048250	10731659.1	17-JAN-25	26-JAN-24
C034189	Abu-Noura	10	182825082	18282508.2	16-OCT-24	09-JAN-24
C037605	Leilaa	10	164694549	16469454.9	27-SEP-24	02-FEB-24

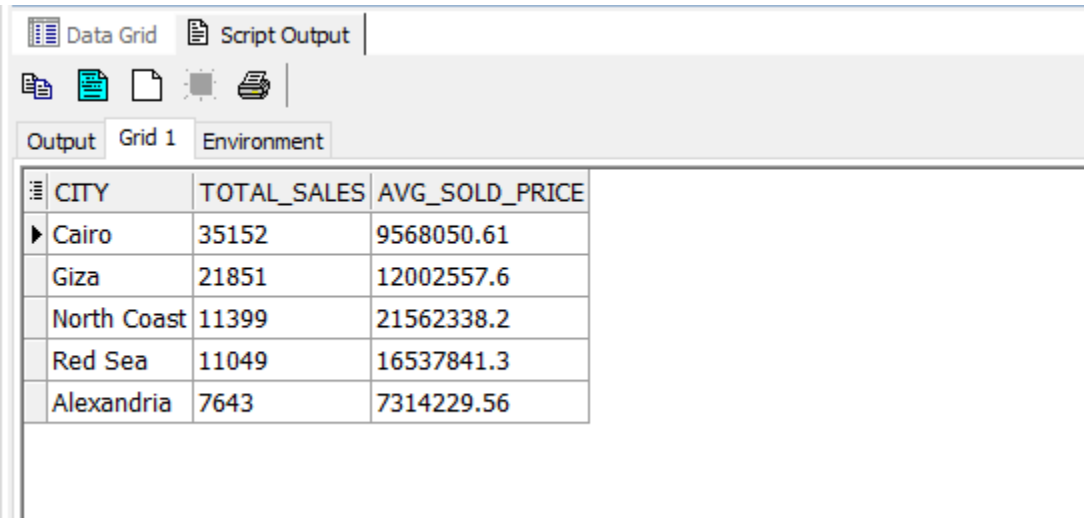
```
--Average Waiting Time
SELECT
    c.customer_id,
    c.name,
    ROUND(AVG(s.sale_date - l.listing_date), 2) AS avg_days_to_purchase
FROM Customers c
JOIN Sales s ON c.customer_id = s.customer_id
JOIN LISTINGS l ON s.listing_id = l.listing_id
GROUP BY c.customer_id, c.name
ORDER BY avg_days_to_purchase;
```



Output | Grid 1 | Environment

CUSTOMER_ID	NAME	AVG_DAYS_TO_PURCHASE
C022151	Dar-Gamal-al	23
C025437	Raed-kan	23
C029348	SNEFERU4327	23
C026726	SaadabAhmed	23
C039500	Aisha94	23
C013449	Um-Layla-a	23
C039877	Ibrahimulmagdy	23
C032769	Laylaeddine	23
C033746	RedaerHorus	23

```sql
--Best cities by sales

SELECT

    l.city,

    COUNT(s.sale_id) AS total_sales,

    AVG(s.sold_price) AS avg_sold_price

FROM Listings l

JOIN Sales s ON l.listing_id = s.listing_id

GROUP BY l.city

ORDER BY total_sales DESC;
```



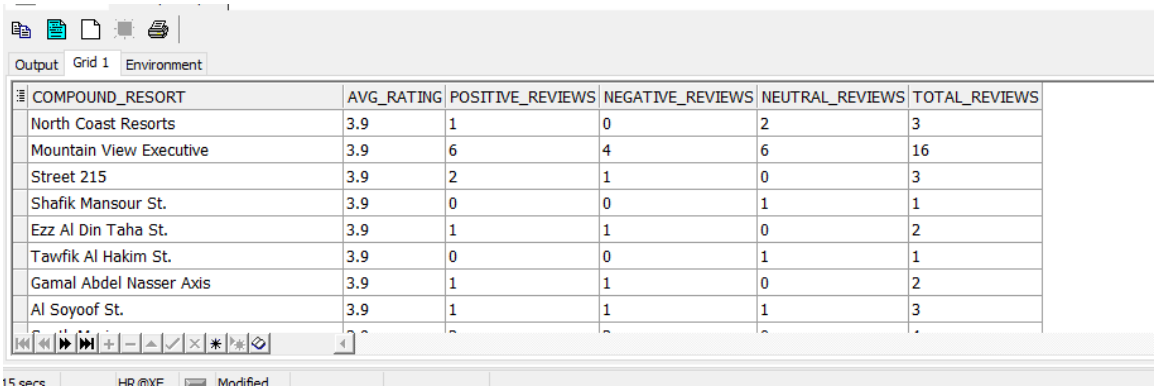
Data Grid | Script Output

Output | Grid 1 | Environment

CITY	TOTAL_SALES	AVG_SOLD_PRICE
Cairo	35152	9568050.61
Giza	21851	12002557.6
North Coast	11399	21562338.2
Red Sea	11049	16537841.3
Alexandria	7643	7314229.56

```sql
--Review Sentiment Analysis

SELECT

    COMPOUND_RESORT,

    AVG(Rating_mock) AS avg_rating,
```

```
    SUM(CASE WHEN Sentiment='Positive' THEN 1 ELSE 0 END) AS positive_reviews,
    SUM(CASE WHEN Sentiment='Negative' THEN 1 ELSE 0 END) AS negative_reviews,
    SUM(CASE WHEN Sentiment='Neutral' THEN 1 ELSE 0 END) AS neutral_reviews,
    COUNT(*) AS total_reviews
    FROM Reviews
GROUP BY COMPOUND_RESORT
ORDER BY avg_rating DESC;
```



Output | Grid 1 | Environment

COMPOUND_RESORT	AVG_RATING	POSITIVE_REVIEWS	NEGATIVE_REVIEWS	NEUTRAL_REVIEWS	TOTAL_REVIEWS
North Coast Resorts	3.9	1	0	2	3
Mountain View Executive	3.9	6	4	6	16
Street 215	3.9	2	1	0	3
Shafik Mansour St.	3.9	0	0	1	1
Ezz Al Din Taha St.	3.9	1	1	0	2
Tawfik Al Hakim St.	3.9	0	0	1	1
Gamal Abdel Nasser Axis	3.9	1	1	0	2
Al Soyoof St.	3.9	1	1	1	3

```
--Lead Conversion Analysis
SELECT
    lead_status,
    COUNT(*) AS total_leads,
    SUM(converted_flag) AS converted_leads,
    ROUND(SUM(converted_flag) * 100.0 / COUNT(*), 2) AS conversion_rate
FROM Leads
GROUP BY lead_status
ORDER BY conversion_rate DESC;
```

Output | Grid 1 | Environment

LEAD_STATUS	TOTAL_LEADS	CONVERTED_LEADS	CONVERSION_RATE
Warm	19739	12419	62.92
Hot	19761	12418	62.84
New	19876	12391	62.34
Contacted	19874	12240	61.59
Lost	19740	0	0

```sql
--Commission vs Speed Correlation

SELECT

    a.agent_id,

    a.company_name,

    CORR(s.commission_rate, l.days_on_market) AS correlation_commission_speed

FROM Agents a

JOIN Listings l ON a.agent_id = l.agent_id

JOIN Sales s ON l.listing_id = s.listing_id

GROUP BY a.agent_id, a.company_name

ORDER BY correlation_commission_speed ASC;
```

Data Grid | Script Output

Output | Grid 1 | Environment

AGENT_ID	COMPANY_NAME	CORRELATION_COMMISSION_SPEED
A1096	Pyramids Developments	.973853029
A0642	Mountain View	.974725106
A2307	Mountain View	.977146277
A3499	Misr Italia Properties	.979795897
A2768	Akam Developments	.984761517
A2656	Akam Developments	.989195042
A0104	Orascom Development	.990656540
A1661	SODIC	.995870595

```sql
--Pareto 80/20 – Property Type Revenue

WITH PropertyRevenue AS (

    SELECT

        property_type,

        SUM(s.sold_price) AS total_revenue

    FROM Sales s

    JOIN Listings l ON s.listing_id = l.listing_id

    GROUP BY property_type

),

Ranked AS (

    SELECT

        property_type,

        total_revenue,
```

```
    ROUND(100 * SUM(total_revenue) OVER (ORDER BY total_revenue DESC) / SUM(total_revenue) OVER (), 2) AS
cumulative_percentage
  FROM PropertyRevenue
)
SELECT
  property_type,
  total_revenue,
  cumulative_percentage,
  CASE WHEN cumulative_percentage <= 80 THEN 'Top 20% Drivers' ELSE 'Long Tail' END AS category
FROM Ranked;
```

Output | Grid 1 | Environment

PROPERTY_TYPE	TOTAL_REVENUE	CUMULATIVE_PERCENTAGE	CATEGORY
Cabin	1850860605	99.81	Long Tail
Whole Building	1565425863	99.95	Long Tail
Full Floor	144520565	99.97	Long Tail
Bungalow	129589213	99.98	Long Tail
Roof	90170152	99.99	Long Tail
Bulk Sale Unit	83196528	100	Long Tail
Half Floor	41931436	100	Long Tail
Bulk Rent Unit	70747	100	Long Tail

```
 --Agent Performance Summary
WITH AgentSales AS (
  SELECT
    a.agent_id,
    a.company_name,
    COUNT(s.sale_id) AS Total_Sales,
    SUM(s.sold_price) AS Total_Revenue,
    AVG(l.days_on_market) AS Avg_Days_On_Market
  FROM Agents a
  LEFT JOIN Sales s ON a.agent_id = s.agent_id
  LEFT JOIN Listings l ON s.listing_id = l.listing_id
  GROUP BY a.agent_id, a.company_name
),
AgentLeads AS (
```

```
    SELECT
        agent_id,
        COUNT(lead_id) AS Total_Leads,
        SUM(converted_flag) AS Leads_Converted,
        ROUND(SUM(converted_flag)*100.0/COUNT(lead_id),2) AS Conversion_Rate
    FROM Leads
    GROUP BY agent_id
)
SELECT
    a.agent_id,
    a.company_name,
    COALESCE(s.Total_Sales,0) AS Total_Sales,
    COALESCE(s.Total_Revenue,0) AS Total_Revenue,
    COALESCE(s.Avg_Days_On_Market,0) AS Avg_Days_On_Market,
    COALESCE(l.Total_Leads,0) AS Total_Leads,
    COALESCE(l.Leads_Converted,0) AS Leads_Converted,
    COALESCE(l.Conversion_Rate,0) AS Conversion_Rate
FROM Agents a
LEFT JOIN AgentSales s ON a.agent_id = s.agent_id
LEFT JOIN AgentLeads l ON a.agent_id = l.agent_id
ORDER BY Total_Revenue DESC;
```

Output | Grid 1 | Environment

AGENT_ID	COMPANY_NAME	TOTAL_SALES	TOTAL_REVENUE	AVG_DAYS_ON_MARKET	TOTAL_LEADS	LEADS_CONVERTED	CONVERSION_RATE
A2148	Baltic-Bohemia Real Estate & Tourism Service	68	1433613351	65.1964286	80	47	58.75
A1112	Minka Developments	29	1428795328	24.125	24	11	45.83
A3066	Baltic-Bohemia Real Estate & Tourism Service	68	1374524272	51.4117647	102	52	50.98
A1032	Baltic-Bohemia Real Estate & Tourism Service	51	1359257453	64.3902439	65	31	47.69
A0938	Palm Hills Developments	32	1349063354	84	23	12	52.17
A1070	Mountain View	34	1332022217	67.8260870	21	14	66.67

```
--City Performance (Top City)
SELECT
    l.city AS City_Name,
    COUNT(s.sale_id) AS Total_Sales,
```

```
    COUNT(DISTINCT l.listing_id) AS Total_Listings,
    SUM(s.sold_price) AS Total_Revenue,
    ROUND(AVG(s.sold_price), 2) AS Avg_Sold_Price,
    ROUND(AVG(l.days_on_market), 2) AS Avg_Days_On_Market
FROM Listings l
LEFT JOIN Sales s ON l.listing_id = s.listing_id
GROUP BY l.city
ORDER BY Total_Revenue DESC;
```

Output | Grid 1 | Environment

CITY_NAME	TOTAL_SALES	TOTAL_LISTINGS	TOTAL_REVENUE	AVG_SOLD_PRICE	AVG_DAYS_ON_MARKET
Cairo	35152	39901	3.3634E+11	9568050.61	44.45
Giza	21851	24879	2.6227E+11	12002557.6	38.17
North Coast	11399	12923	2.4579E+11	21562338.3	91.84
Red Sea	11049	12514	1.8273E+11	16537841.3	56.8
Alexandria	7643	8640	5.5903E+10	7314229.56	39.13

```
----------Sales and revenue trends over time (monthly or quarterly)


SELECT
    TO_CHAR(s.sale_date, 'YYYY-MM') AS Month,
    COUNT(s.sale_id) AS Total_Sales,
    SUM(s.sold_price) AS Total_Revenue
FROM Sales s
GROUP BY TO_CHAR(s.sale_date, 'YYYY-MM')
ORDER BY Month;
```

MONTH	TOTAL_SALES	TOTAL_REVENUE
2024-01	941	1.2865E+10
2024-02	8863	1.1423E+11
2024-03	11691	1.4842E+11
2024-04	11045	1.3973E+11
2024-05	1619	2.0018E+10
2024-06	779	8396921572
2024-07	2026	2.4504E+10
2024-08	13045	1.6256E+11

```
--Market Insights & Pricing Distribution  Helps visualize property pricing ranges per city or type.

SELECT

    l.city,

    l.property_type,

    ROUND(AVG(s.sold_price), 2) AS Avg_Price,

    MIN(s.sold_price) AS Min_Price,

    MAX(s.sold_price) AS Max_Price

FROM Listings l

JOIN Sales s ON l.listing_id = s.listing_id

GROUP BY l.city, l.property_type

ORDER BY Avg_Price DESC;
```

Output | Grid 1 | Environment

CITY	PROPERTY_TYPE	AVG_PRICE	MIN_PRICE	MAX_PRICE
Red Sea	Palace	339570434	339570434	339570434
North Coast	Palace	171942155	1747020	750643639
Giza	Palace	162018780	451540	300851083
Giza	Land	136221199	845008	1000552081
Cairo	Land	134838078	6292584	1000777748
Cairo	Palace	84950718.6	331711	250817110
Cairo	Whole Building	82200314.1	7978986	356823427
Red Sea	Full Floor	80704582	80704582	80704582

798 msecs | HR@XE | Modified

AutoCommit is OFF | CAPS | NUM | INS

```
--Total Leads Generated
```

```
SELECT COUNT(*) AS Total_Leads FROM Leads;
```

Output | Grid 1 | Environment

TOTAL_LEADS
98990

```
--Conversion Rate (Leads ? Sales)

SELECT ROUND(SUM(converted_flag)*100.0/COUNT(*),2) AS Conversion_Rate FROM Leads;
```

Output | Grid 1 | Environment

CONVERSION_RATE
49.97

```
--Average Property Value Sold

SELECT ROUND(AVG(sold_price),2) AS Avg_Property_Value FROM Sales;
```

Output | Grid 1 | Environment

AVG_PROPERTY_VALUE
12435097.2

```
--Revenue per Agent

SELECT agent_id, SUM(sold_price) AS Revenue FROM Sales GROUP BY agent_id;
```

Output | Grid 1 | Environment

AGENT_ID	REVENUE
A2199	614906618
A2811	348999720
A0915	342930229
A3257	104393883
A2354	313501961
A1107	195560232
A1702	182924218
A3230	233691658

```
--Average Sales Cycle Duration

SELECT ROUND(AVG(s.sale_date - l.listing_date),2) AS Avg_Sales_Cycle FROM Sales s JOIN Listings l ON
s.listing_id=l.listing_id;
```

AVG_SALES_CYCLE
41.24

--Active Listings by Status and Region

```
SELECT city, LISTING_STATUS, COUNT(*) FROM Listings GROUP BY city, LISTING_STATUS;
```

CITY	LISTING_STATUS	COUNT(*)
Giza	Active	12386
North Coast	Rented	231
Red Sea	Rented	27
Alexandria	Active	4314
Alexandria	Sold	3742
Giza	Rented	2475
Red Sea	Sold	6251
Cairo	Rented	9973

309 msecs HR@XE Modified

--Cost per Lead

```
SELECT
    m.CAMPAIGN_SOURCE AS Lead_Source,
    SUM(m.COST) AS Total_Cost,
    COUNT(l.LEAD_ID) AS Total_Leads,
    ROUND(SUM(m.COST) / NULLIF(COUNT(l.LEAD_ID), 0), 2) AS Cost_Per_Lead
FROM MARKETING_CAMPAIGN m
JOIN LEADS l ON m.CAMPAIGN_ID = l.CAMPAIGN_ID
GROUP BY m.CAMPAIGN_SOURCE
ORDER BY Cost_Per_Lead ASC;
```

Output | Grid 1 | Environment

LEAD_SOURCE	TOTAL_COST	TOTAL_LEADS	COST_PER_LEAD
Google Ads	1.0017E+10	16605	603227.6
Website	9920001236	16412	604435.85
YouTube	1.0080E+10	16671	604650.41
Instagram	9922972378	16368	606242.2
Email	9946980035	16392	606819.18
Facebook	1.0078E+10	16542	609210.8

```
--Cost_Per_Click,
SELECT
    Campaign_Source,
    SUM(Cost) AS Total_Cost,
    SUM(Clicks) AS Total_Clicks,
    SUM(Engagement_Score) AS Total_Engagement,
    ROUND(SUM(Cost) / NULLIF(SUM(Clicks), 0), 2) AS Cost_Per_Click,
    ROUND(SUM(Cost) / NULLIF(SUM(Engagement_Score), 0), 2) AS Cost_Per_Engagement
FROM MARKETING_CAMPAIGN
GROUP BY Campaign_Source
ORDER BY Cost_Per_Click ASC;
```

Output | Grid 1 | Environment

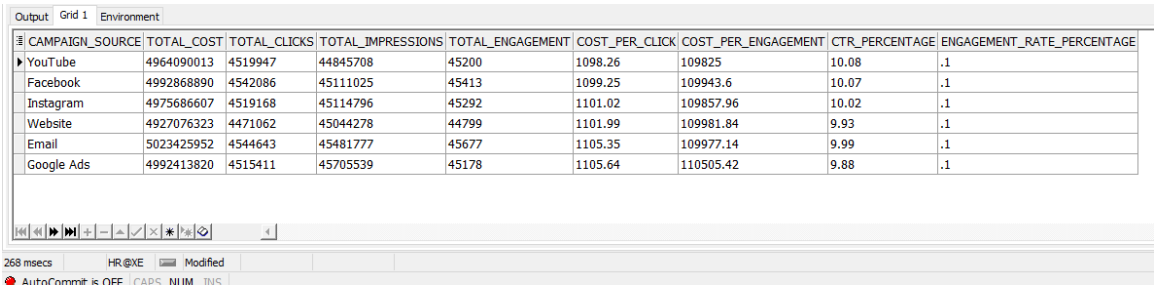
CAMPAIGN_SOURCE	TOTAL_COST	TOTAL_CLICKS	TOTAL_ENGAGEMENT	COST_PER_CLICK	COST_PER_ENGAGEMENT
YouTube	4964090013	4519947	45200	1098.26	109825
Facebook	4992868890	4542086	45413	1099.25	109943.6
Instagram	4975686607	4519168	45292	1101.02	109857.96
Website	4927076323	4471062	44799	1101.99	109981.84
Email	5023425952	4544643	45677	1105.35	109977.14
Google Ads	4992413820	4515411	45178	1105.64	110505.42

249 msecs | HR@XE | Modified

AutoCommit is OFF | CAPS | NUM | INS

----------Marketing Channel Performance Summary

```sql
SELECT
    Campaign_Source,
    SUM(Cost) AS Total_Cost,
    SUM(Clicks) AS Total_Clicks,
    SUM(Impressions) AS Total_Impressions,
    SUM(Engagement_Score) AS Total_Engagement,

    ROUND(SUM(Cost) / NULLIF(SUM(Clicks), 0), 2) AS Cost_Per_Click,
    ROUND(SUM(Cost) / NULLIF(SUM(Engagement_Score), 0), 2) AS Cost_Per_Engagement,
    ROUND((SUM(Clicks) / NULLIF(SUM(Impressions), 0)) * 100, 2) AS CTR_Percentage,
    ROUND((SUM(Engagement_Score) / NULLIF(SUM(Impressions), 0)) * 100, 2) AS Engagement_Rate_Percentage

FROM MARKETING_CAMPAIGN
GROUP BY Campaign_Source
ORDER BY Cost_Per_Click ASC;
```



Output | Grid 1 | Environment

CAMPAIGN_SOURCE	TOTAL_COST	TOTAL_CLICKS	TOTAL_IMPRESSIONS	TOTAL_ENGAGEMENT	COST_PER_CLICK	COST_PER_ENGAGEMENT	CTR_PERCENTAGE	ENGAGEMENT_RATE_PERCENTAGE
YouTube	4964090013	4519947	44845708	45200	1098.26	109825	10.08	.1
Facebook	4992868890	4542086	45111025	45413	1099.25	109943.6	10.07	.1
Instagram	4975686607	4519168	45114796	45292	1101.02	109857.96	10.02	.1
Website	4927076323	4471062	45044278	44799	1101.99	109981.84	9.93	.1
Email	5023425952	4544643	45481777	45677	1105.35	109977.14	9.99	.1
Google Ads	4992413820	4515411	45705539	45178	1105.64	110505.42	9.88	.1

268 msecs | HR@XE | Modified

AutoCommit is OFF | CAPS | NUM | INS

```sql
--Lead Source Effectiveness
SELECT
    m.Campaign_Source AS Lead_Source,
    COUNT(l.Lead_ID) AS Total_Leads,
    SUM(l.Converted_Flag) AS Converted_Leads,
    ROUND(SUM(l.Converted_Flag) * 100.0 / COUNT(l.Lead_ID), 2) AS Conversion_Rate_Percentage,
    ROUND(SUM(m.Cost) / NULLIF(SUM(l.Converted_Flag), 0), 2) AS Cost_Per_Converted_Lead
FROM Leads l
JOIN Marketing_Campaign m
    ON l.Campaign_ID = m.Campaign_ID
```

```
GROUP BY m.Campaign_Source
ORDER BY Conversion_Rate_Percentage DESC;
```

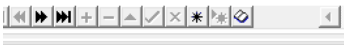
Output | Grid 1 | Environment

LEAD_SOURCE	TOTAL_LEADS	CONVERTED_LEADS	CONVERSION_RATE_PERCENTAGE	COST_PER_CONVERTED_LEAD
Instagram	16368	8291	50.65	1196836.62
Email	16392	8218	50.13	1210389.39
Google Ads	16605	8308	50.03	1205656.51
YouTube	16671	8295	49.76	1215205.18
Website	16412	8148	49.65	1217476.83
Facebook	16542	8208	49.62	1227773.51

```
----------CREATE TRIGGER----------
CREATE OR REPLACE TRIGGER trg_sales_update_audit
BEFORE UPDATE ON sales
FOR EACH ROW
BEGIN
   INSERT INTO sales_audit (
      audit_id,
      sale_id,
      old_sold_price,
      old_commission_rate,
      old_commission_value,
      modified_date,
      modified_by
   )
   VALUES (
      sales_audit_seq.NEXTVAL,
      :OLD.sale_id,
      :OLD.sold_price,
      :OLD.commission_rate,
      :OLD.commission_value,
      SYSDATE,
```

```
        USER
    );
END;
/
UPDATE sales
SET sold_price = sold_price + 1000
WHERE sale_id = 'S000001';

SELECT * FROM sales_audit
ORDER BY audit_id DESC;
```

AUDIT_ID	SALE_ID	OLD_SOLD_PRICE	OLD_COMMISSION_RATE	OLD_COMMISSION_VALUE	MODIFIED_DATE	MODIFIED_BY
6	S000001	5074232	.028	142050	03-NOV-25	HR
5	S000001	5073232	.028	142050	03-NOV-25	HR
4	S000003	5808300	.028	162604	01-NOV-25	HR
2	S000002	13397384	.028	375127	30-OCT-25	HR
1	S000001	5073232	.028	142050	30-OCT-25	HR

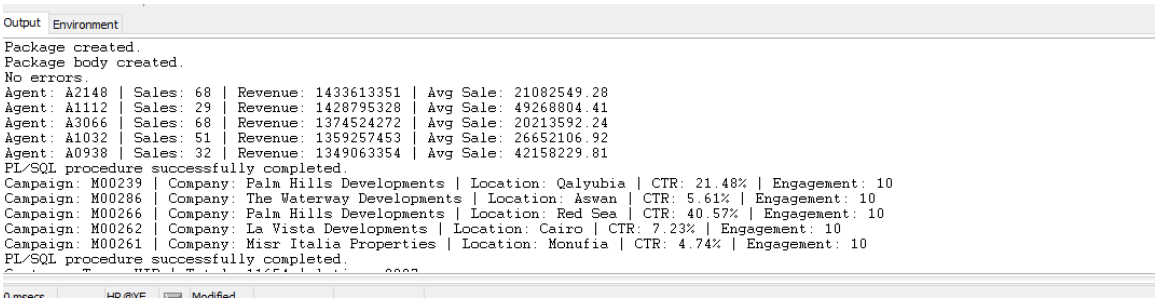


```
--------------------------------CREATE PACKAGE-----------------------------------------------------
CREATE OR REPLACE PACKAGE RealEstate_Pkg AS
    PROCEDURE Show_Top_Agents(p_top_n IN NUMBER DEFAULT 5);
    PROCEDURE Campaign_Performance(p_top_n IN NUMBER DEFAULT 5);
    PROCEDURE Customer_Summary;
END RealEstate_Pkg;
/

CREATE OR REPLACE PACKAGE BODY RealEstate_Pkg AS

-- Show top Agents by sales
PROCEDURE Show_Top_Agents(p_top_n IN NUMBER DEFAULT 5) IS
BEGIN
    FOR rec IN (
        SELECT * FROM (
```

```
        SELECT
            a.agent_id,
            COUNT(s.sale_id) AS total_sales,
            SUM(s.sold_price) AS total_revenue,
            ROUND(SUM(s.sold_price)/COUNT(s.sale_id),2) AS avg_sale,
            ROW_NUMBER() OVER (ORDER BY SUM(s.sold_price) DESC) AS rn
        FROM sales s
        JOIN listings l ON s.listing_id = l.listing_id
        JOIN agents a ON s.agent_id = a.agent_id
        GROUP BY a.agent_id
    )
    WHERE rn <= p_top_n
  ) LOOP
    DBMS_OUTPUT.PUT_LINE(
        'Agent: ' || rec.agent_id ||
        ' | Sales: ' || rec.total_sales ||
        ' | Revenue: ' || rec.total_revenue ||
        ' | Avg Sale: ' || rec.avg_sale
    );
  END LOOP;
END Show_Top_Agents;


------------------------------CREATE PROCEDURES-----------------------------------------------------------
-- Marketing campaign performance
PROCEDURE Campaign_Performance(p_top_n IN NUMBER DEFAULT 5) IS
BEGIN
  FOR rec IN (
    SELECT * FROM (
        SELECT
            c.campaign_id,
```

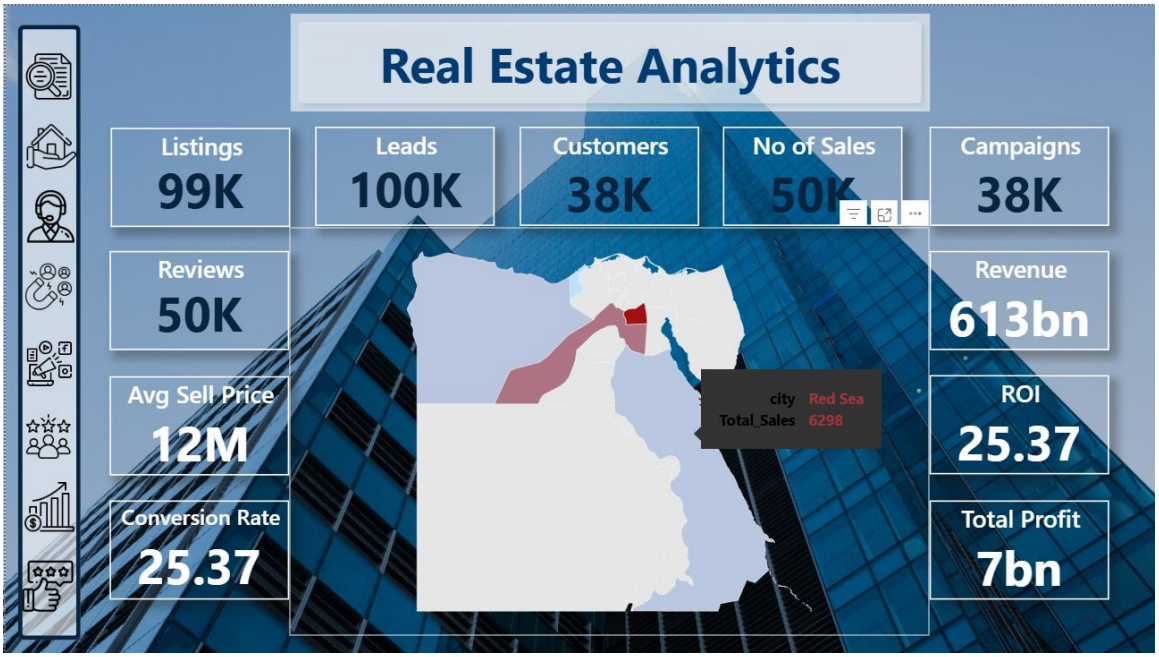
```
            c.company_name,
            c.location,
            ROUND((c.clicks / NULLIF(c.impressions, 0)) * 100, 2) AS ctr_percent,
            ROUND(c.engagement_score, 2) AS engagement_score,
            ROW_NUMBER() OVER (ORDER BY c.engagement_score DESC) AS rn
        FROM marketing_campaign c
    )
    WHERE rn <= p_top_n
  ) LOOP
    DBMS_OUTPUT.PUT_LINE(
      'Campaign: ' || rec.campaign_id ||
      ' | Company: ' || rec.company_name ||
      ' | Location: ' || rec.location ||
      ' | CTR: ' || rec.ctr_percent || '%' ||
      ' | Engagement: ' || rec.engagement_score
    );
  END LOOP;
END Campaign_Performance;
PROCEDURE Customer_Summary IS
BEGIN
  FOR rec IN (
    SELECT
      customer_type,
      COUNT(*) AS total_customers,
      SUM(CASE WHEN support_status = 'Active' THEN 1 ELSE 0 END) AS active_customers
    FROM customers
    GROUP BY customer_type
  ) LOOP
    DBMS_OUTPUT.PUT_LINE(
      'Customer Type: ' || rec.customer_type ||
```

```
            ' | Total: ' || rec.total_customers ||
            ' | Active: ' || rec.active_customers
        );
    END LOOP;
END Customer_Summary;


END RealEstate_Pkg;
/
SHOW ERRORS;
SET SERVEROUTPUT ON;
EXEC RealEstate_Pkg.Show_Top_Agents;
EXEC RealEstate_Pkg.Campaign_Performance;
EXEC RealEstate_Pkg.Customer_Summary;
```

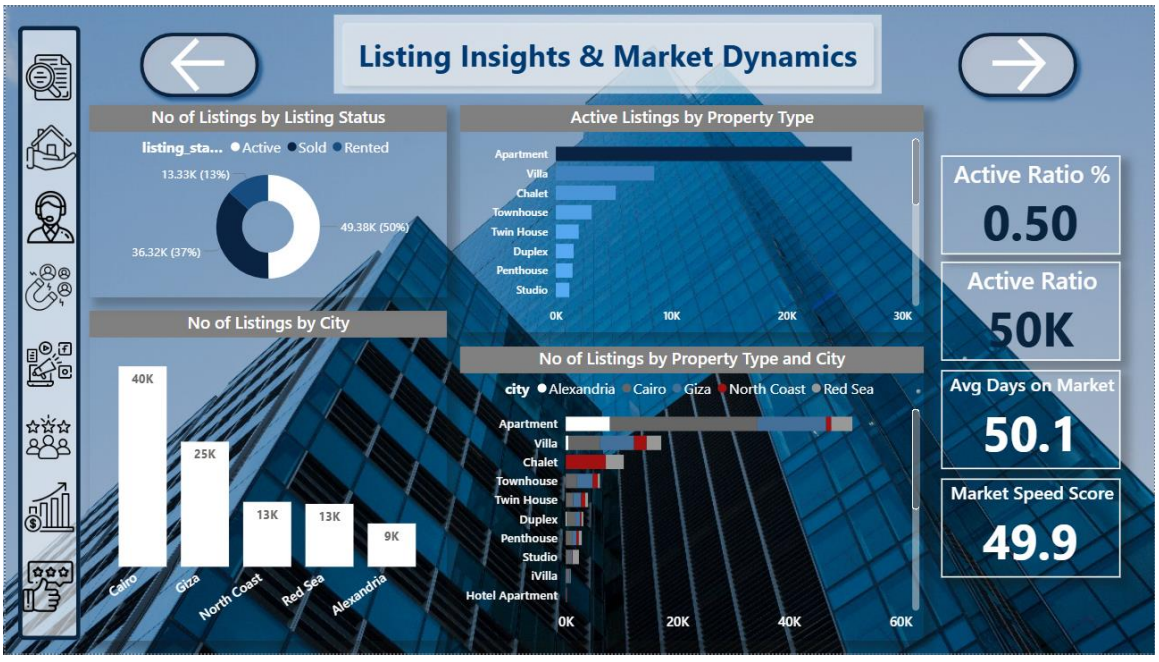


5. Dashboard

5.1 overview



5.2 Listings

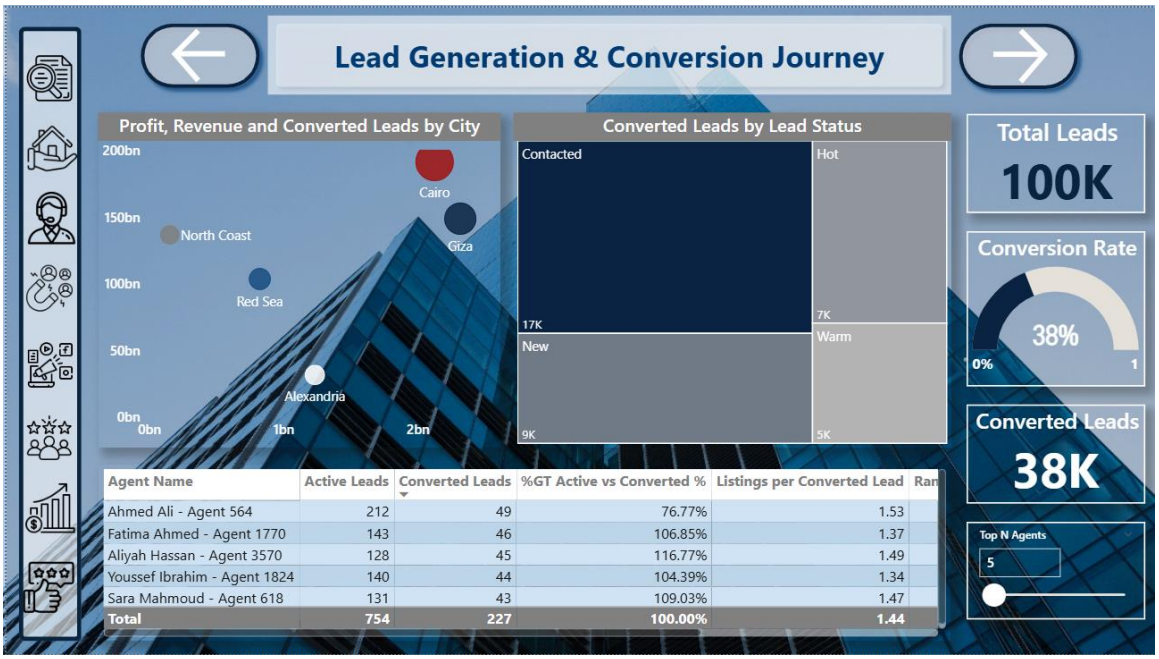


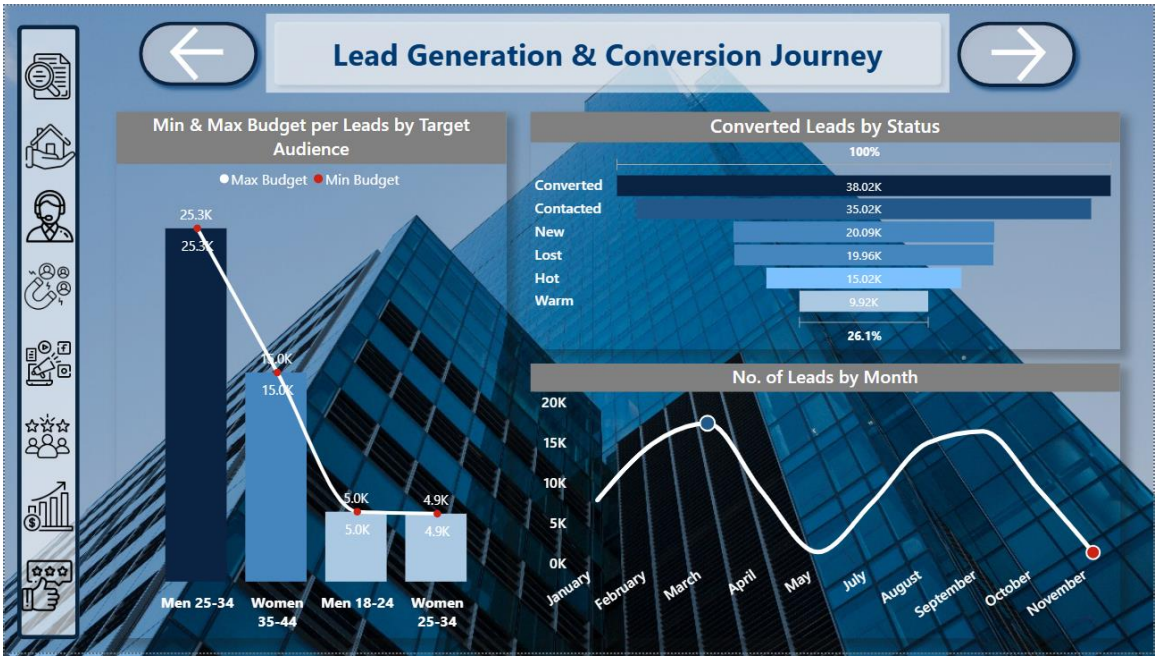

Listing Insights & Market Dynamics
Total Listings by Month and Listing Status
listing_status Active Rented Sold
5K
0K
January
February
March
April
May
June
July
August
September
October
November
December
Desc Days on Market by City
Avg of days on market
Median Value
Mean Value
400.00
300.00
200.00
100.00
0.00
Alexandria
Cairo
Giza
North Coast
Red Sea
Avg of Days on Market by City
91.67
56.94
44.39
39.13
38.28
North Coast
Red Sea
Cairo
Alexandria
Giza
Total Revenue by Property Type
Villa
256bn
Chalet
67bn
Town...
50bn
Apartment
148bn
Twin House
41bn
Dupl...
15bn
Penthouse
Market Speed Score by City
62
61
56
43
Giza
Alexandria
Cairo
Red Sea
North Coast


Listing Insights & Market Dynamics
Total Profit by Month and Listing Type
Increase
Decrease
Total
Other
1.5bn
1.0bn
0.5bn
0.0bn
January
Sale
Rent
February
Sale
Rent
March
Rent
Sale
April
Rent
Sale
May
Sale
Rent
June
Sale
Rent
July
Sale
Rent
August
Sale
Rent
September
Sale
Rent
October
Rent
Sale
November
Rent
Sale
December

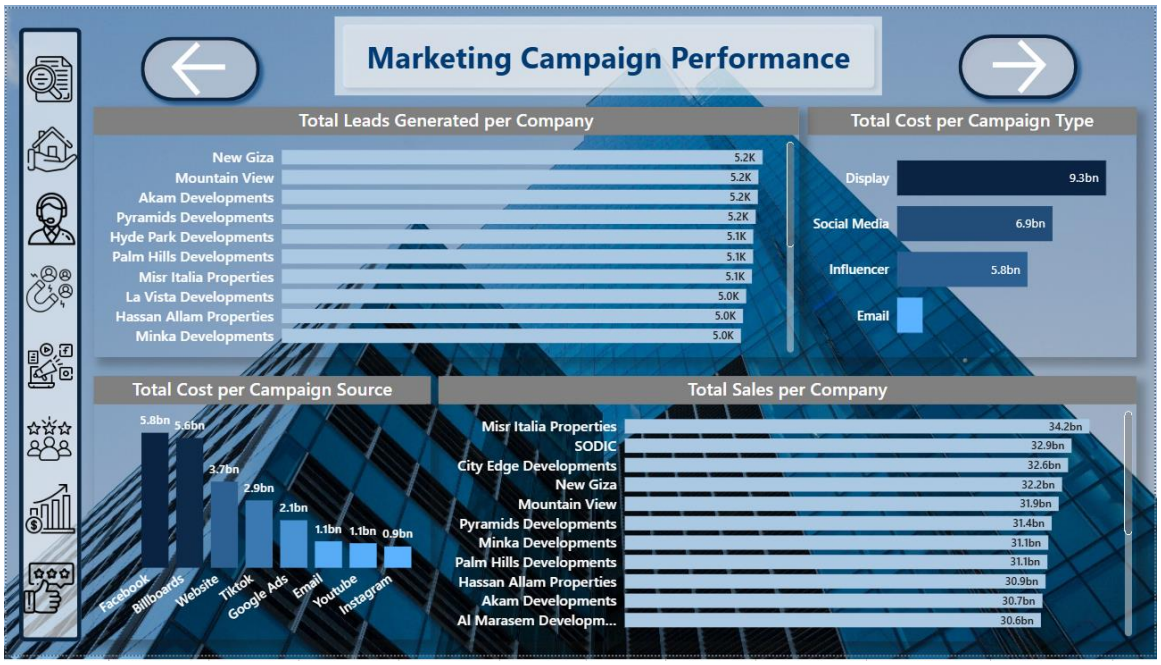
5.3 Agents

5.4 Leads





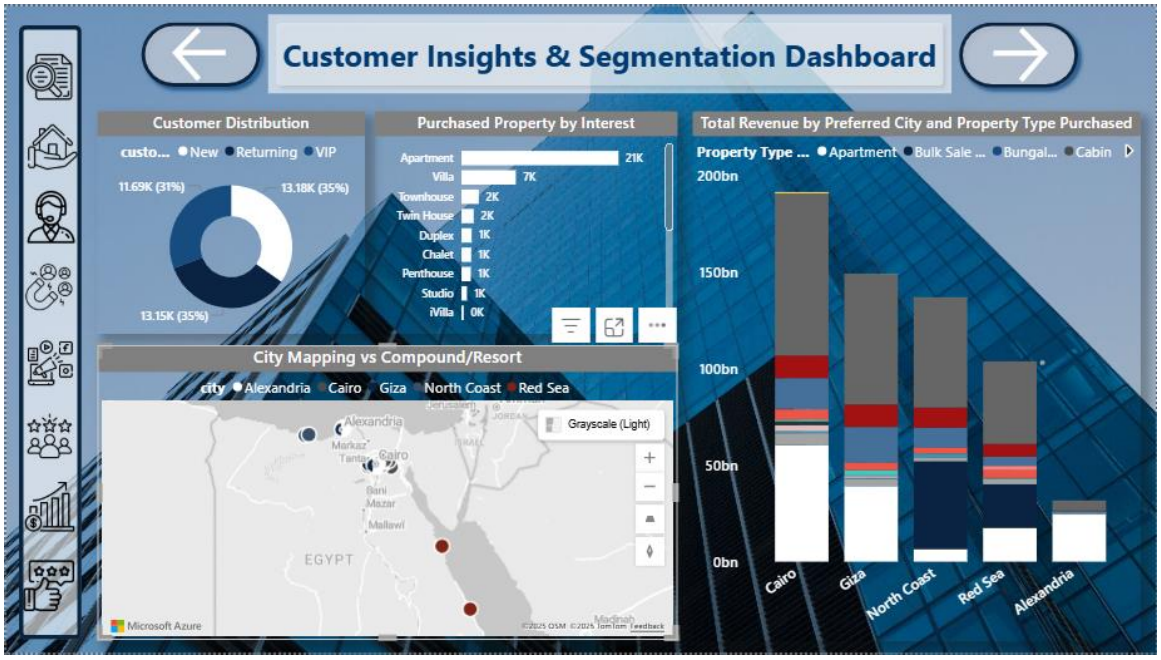
5.5 Campaigns

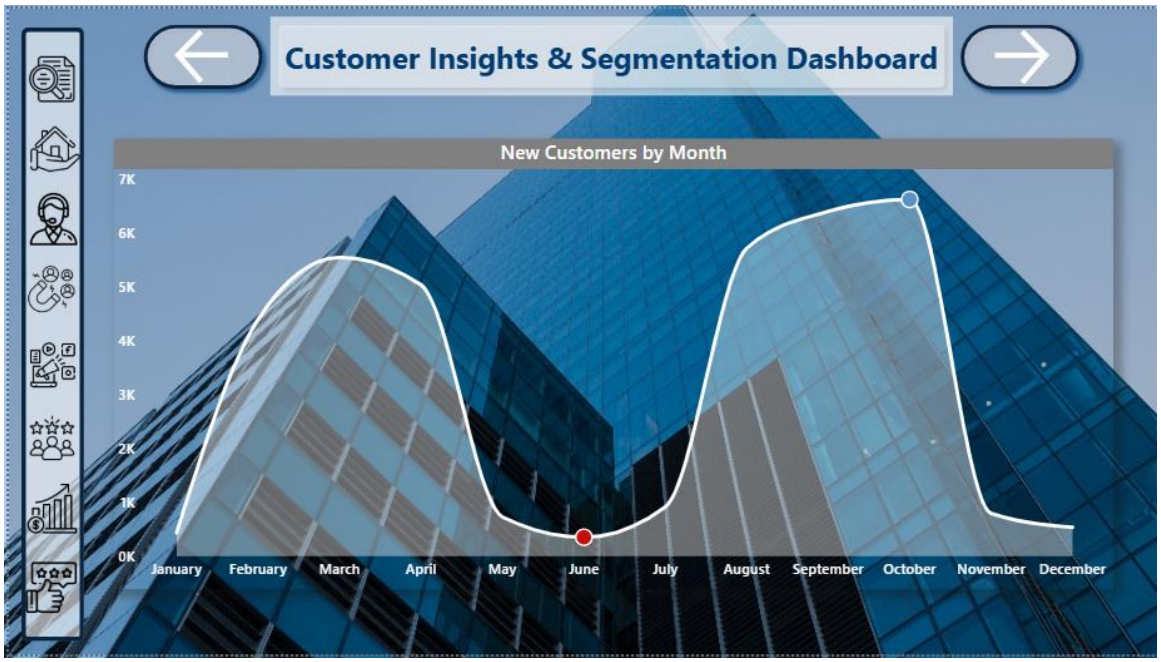

Marketing Campaign Performance
Total Leads Generated per Company
New Giza 5.2K
Mountain View 5.2K
Akam Developments 5.2K
Pyramids Developments 5.2K
Hyde Park Developments 5.1K
Palm Hills Developments 5.1K
Misr Italia Properties 5.1K
La Vista Developments 5.0K
Hassan Allam Properties 5.0K
Minka Developments 5.0K
Total Cost per Campaign Type
Display 9.3bn
Social Media 6.9bn
Influencer 5.8bn
Email
Total Cost per Campaign Source
5.8bn
5.6bn
3.7bn
2.9bn
2.1bn
1.1bn
1.1bn
0.9bn
Facebook
Billboards
Website
Tiktok
Google Ads
Email
Youtube
Instagram
Total Sales per Company
Misr Italia Properties 34.2bn
SODIC 32.9bn
City Edge Developments 32.6bn
New Giza 32.2bn
Mountain View 31.9bn
Pyramids Developments 31.4bn
Minka Developments 31.1bn
Palm Hills Developments 31.1bn
Hassan Allam Properties 30.9bn
Akam Developments 30.7bn
Al Marasem Developm... 30.6bn


Marketing Campaign Performance
Total Cost by Objective
Geographical_Expansion
9bn
High-End Buyer Targeting
8bn
Property Promotion
5bn
Lead Generation
1bn
Variance of Cost & No of Locations by Objective and Eng Score
objective Geographical_Expansion High-End Buyer Tar... Lead Generation Property Promoti...
10
5
0
38bn
40bn
42bn
44bn
46bn
48bn
Sum of Weight by Source and Target
All Ages
Men 18-24
Men 25-34
Women 25-34
Women 35-44
Lost
Contacted
Hot
New
Warm
No Sale
Sale

Company	Cost per Lead	Cost per Sale	Avg Clicks per Campaign	Impressions	Avg Engagement Score	Leads per Company
Akam Developments	12,043.07	24,258.38	544.78	10887542	5.43	5175
Al Marasem Development	11,572.44	23,310.38	556.74	10562025	5.54	4937
City Edge Developments	11,599.12	23,364.12	547.75	10581555	5.52	4971
Emaar Misr	11,503.31	23,171.13	540.79	10477601	5.53	4924
Hassan Allam Properties	11,684.15	23,535.40	554.16	10568951	5.45	5014
Hyde Park Developments	11,814.60	23,798.18	549.22	11057496	5.45	5125
IWAN Developments	11,273.30	22,707.82	533.83	10258351	5.52	4796
Total	232,444.03	468,212.37	549.32	210970676	5.50	100000

5.6 Customers





5.7 Sales


Sales & Profitability Analysis
Total Revenue
613bn
0T
1T
Total Profit
7bn
0bn
10bn
Total Sales
50K
0K
100K
Avg Profit per Property
11.90M
0.00M
100M
Total Profit by Preferred City
Preferred City
Giza
Cairo
Alexandria
Red Sea
North Coast
1bn (12%)
2bn (35%)
1bn (19%)
2bn (32%)
Sales by Preferred City & Property Type
preferred_city
property_type
Giza
Cairo
20004
Giza
12556
North Coast
6461
Red Sea
6298
Alexandria
4326
Total_Sales
49645
Apartment
6152
Villa
3087
Townhouse
1385
Twin House
752
Duplex
434
Total Sales by Property Type
Apartment
Villa
Chalet
Townhouse
Twin House
Duplex
Penthouse
Studio
iVilla
26K
9K
5K
3K
2K
2K
1K
1K
0K


Sales & Profitability Analysis
Total Revenue & Profit Margin by Year & Month
Total Revenue
Profit Margin
6bn
62bn
78bn
76bn
11bn
4bn
14bn
92bn
105bn
123bn
16bn
14bn
14bn
0.009
0.008
0.010
0.010
0.010
0.024
0.011
0.010
0.012
0.012
0.014
0.013
0.014
0.02
0.01
January
February
March
April
May
June
July
August
September
October
November
December
January
2024
2025
Tot Revenue by Customer Type
239bn
188bn
186bn
VIP
Returning
New


Sales & Profitability Analysis
Total Profit by City
Total_Profit by city
Apartment : 5.6b
Chalet : 940.9m
2.3b
635.4m
Total_Profit
2b
1.5b
1.0b
500m
0
600m
500m
400m
300m
200m
100m
101.8m
772.9k
Cairo
Giza
Alexandria
Red Sea
North Coast

5.8 Reviews


Customer Satisfaction & Reviews
Avg Rating by Sentiment
Positive
Neutral
Negative
3.8
3.8
3.7
Avg Rating by Compound,Resort & Campaign Source
Compound-Resort
Billboards
Email
Facebook
Google Ads
Instagram
Tiktok
Zuhair Sabry St. 3.00
Zoya 4.58 3.95 4.75 4.60
Zou Al Fekar St.
Zoom Plaza 2.80 4.60
Zomra East 3.17 3.62 4.00 3.12 3.28
Zomoroda 4.20
Zizinia St. 3.32 3.27 3.93 4.90 4.53
Zizinia Gardens 4.00
Zizinia Flowers 2.80
Total 3.76 3.77 3.75 3.77 3.73 3.74
Avg Rating by Month
3.80
3.75
3.70
January
February
March
April
May
July
August
September
October
November
Total Reviews
50K
Pos Reviews %
0.34
Neg Reviews %
0.4
Neutral Reviews%
0.3
Review Coverage %
1

6. Appendices

Scraping Code

Property Finder - Properties:

```
from bs4 import BeautifulSoup
import pandas as pd
from selenium import webdriver
import time
import re


houses_data = []


driver = webdriver.Chrome()


for i in range(1, 300):
    url = f'https://www.propertyfinder.eg/en/search?l=2254&c=1&fu=0&ob=mr&page={i}'
    driver.get(url)
    time.sleep(5)


    soup = BeautifulSoup(driver.page_source, 'html.parser')


    houses = soup.find_all('li', attrs={'data-testid': True})
    if not houses:
        print(f"No houses found on page {i}")
        continue


    for house in houses:
        try:
            # Price
```

```
price_tag = house.find('p', class_=re.compile('price'))
price = price_tag.text.strip() if price_tag else 'N/A'

# Location
location_tag = house.find('p', class_=re.compile('location'))
location = location_tag.text.strip() if location_tag else 'N/A'

# Property Type
property_type_tag = house.find('p', class_=re.compile('property-type'))
property_type = property_type_tag.text.strip() if property_type_tag else 'N/A'

# Listed Since
time_listed_tag = house.find('p', class_=re.compile('publish-info'))
time_listed = time_listed_tag.text.strip() if time_listed_tag else 'N/A'

# Bedrooms, Bathrooms, Area
details_tags = house.find_all('p', class_=re.compile('details-item'))
bedrooms = details_tags[0].text.strip() if len(details_tags) > 0 else 'N/A'
bathrooms = details_tags[1].text.strip() if len(details_tags) > 1 else 'N/A'
area = details_tags[2].text.strip() if len(details_tags) > 2 else 'N/A'


houses_data.append({
    'Price': price,
    'Location': location,
    'Property Type': property_type,
    'Bedrooms': bedrooms,
    'Bathrooms': bathrooms,
    'Area': area,
```

```
            'Listed Since': time_listed
        })

    except Exception as e:
        print(f"Error on page {i}: {e}")
        continue

driver.quit()

# Save data to CSV
df = pd.DataFrame(houses_data)
df.to_csv('property_fider_data.csv', index=False, encoding='utf-8-sig')

print("Data has been scraped and saved to property_finder_data.csv")
```

Fastbase – Agents:

```
# pip install selenium beautifulsoup4 pandas tqdm openpyxl
from selenium import webdriver
from selenium.webdriver.chrome.service import Service
from selenium.webdriver.chrome.options import Options
from bs4 import BeautifulSoup
from tqdm import tqdm
import pandas as pd
import time

chrome_options = Options()
chrome_options.add_argument("--headless")
chrome_options.add_argument("--no-sandbox")
```

```
chrome_options.add_argument("--disable-dev-shm-usage")

driver = webdriver.Chrome(options=chrome_options)

countries = ["Egypt", "Saudi-Arabia", "United-Arab-Emirates"]
pages = 50
all_data = []

print("  Fetching data from FastBase using Selenium...")

for country in countries:
    base_url = f"https://www.fastbase.com/countryindex/{country}/R/Real-estate-agency"
    print(f"\n Fetching: {country}")

    for page in tqdm(range(1, pages + 1), desc=f"{country}"):
        url = f"{base_url}?page={page}"
        driver.get(url)
        time.sleep(7)

        soup = BeautifulSoup(driver.page_source, "html.parser")
        rows = soup.select("table.table tbody tr")

        for row in rows:
            name = row.select_one(".td_cinx_cname")
            contact = row.select_one(".td_cinx_con_per")
            email = row.select_one(".td_cinx_email")
            phone = row.select_one(".td_cinx_phone")
            city = row.select_one(".td_cinx_city")
            street = row.select_one(".td_cinx_street")
```

```
        def text_of(cell):
            if not cell:
                return ""
            return cell.get("title", cell.get_text(strip=True))

        all_data.append({
            "Company Name": text_of(name),
            "Contact Person": text_of(contact),
            "Email": text_of(email),
            "Phone": text_of(phone),
            "Street": text_of(street),
            "City": text_of(city),
            "Country": country.replace("-", " ")
        })

driver.quit()

df = pd.DataFrame(all_data)
df.to_excel("agents_multi.xlsx", index=False)

print(f"\n Done! Extracted {len(all_data)} agents and saved to 'fastbase_agents_multi.xlsx'")
```

Dataset References:

Properties: https://www.propertyfinder.eg

Campaigns & Reviews: https://www.kaggle.com

Agents: https://www.fastbase.com/countryindex/Egypt/R/Real-estate-agency