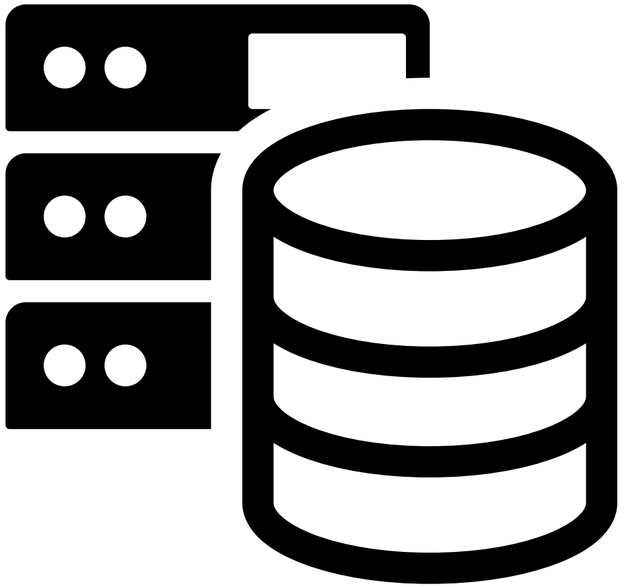
GOOGLE ADS

ANALYSIS



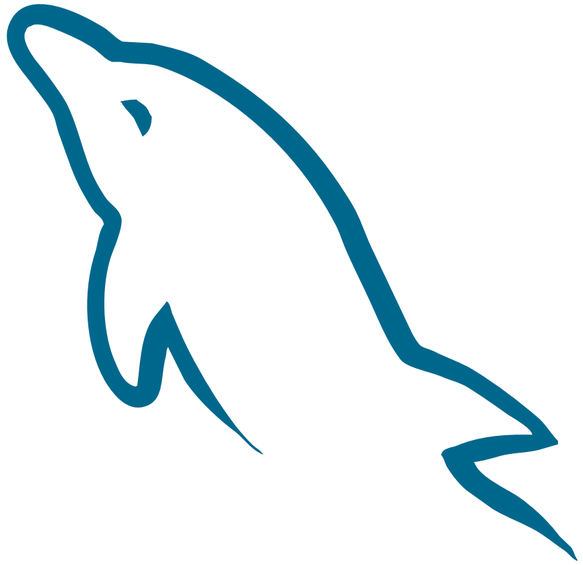
DATASET

Dataset was obtained through kaggle
link:
https://www.kaggle.com/datasets/nayakganesh007/google-ads-sales-dataset

DATASET INCONSITENCY

The dataset consists of 13 columns with many inconsistencies such as:

- Variations in campaign name due to typos.
- Inconsistent format for date
- Case Variations in Location and Device
- Typos in Keywords



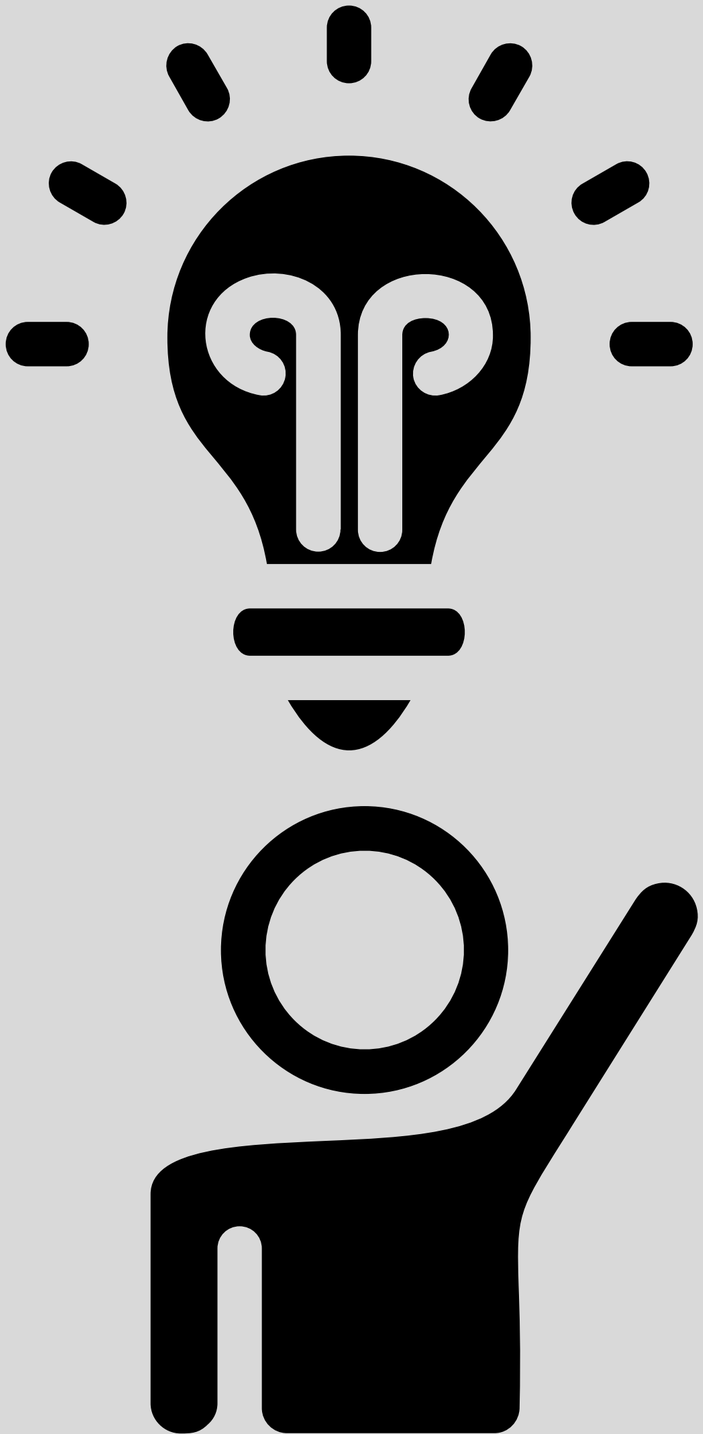
TOOLS FOR ANALYSIS

MySQL was used to manipulate and analyze the dataset, helping uncover patterns and relationships between variables.

The SQL-processed data was then visualized in Tableau, allowing for deeper exploration and clearer insights.

This presentation primarily highlights the results of the SQL queries and the insights derived from them.

DATA UNDERSTANDING



```sql
#---UNDERSTAND THE DATASET---

SELECT * FROM ads_data;
```

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

Ad_ID	Campaign_Name	Clicks	Impressions	Cost	Leads	Conversions	Conversion Rate	Sale_Amount	Ad_Date	Location	Device	Keyword
A1000	DataAnalyticsCourse	104	4498	$231.88	14	7	0.058	$1892	2024-11-16	hyderabad	desktop	learn data analytics
A1001	DataAnalyticsCourse	173	5107	$216.84	10	8	0.046	$1679	20-11-2024	hyderabad	mobile	data analytics course
A1002	Data Anlytics Corse	90	4544	$203.66	26	9		$1624	2024/11/16	hyderabad	Desktop	data analitics online
A1003	Data Analytcis Course	142	3185	$237.66	17	6		$1225	2024-11-26	HYDERABAD	tablet	data anaytics training
A1004	Data Analytics Corse	156	3361	$195.9	30	8		$1091	2024-11-22	hyderabad	desktop	online data analytic
A1005	DataAnalyticsCourse	195	3776	$243.57	10	8		$1315	16-11-2024	hyderabad	MOBILE	data anaytics training
A1006	Data Analytics Corse	116	4480	$237.79	17	5	0.043	$1640	06-11-2024	hyderabad	TABLET	data analytics course
A1007	Data Analytics Corse	184	5060	$229.61	23	3	0.016	$1509	2024/11/24	Hyderbad	TABLET	analytics for data
A1008	Data Analytics Corse	113	5434		27	4	0.058	$1362	2024/11/24	Hyderbad	Tablet	data anaytics training
A1009	Data Analytcis Course	166	3355	$186.78	24	9	0.054	$1029	2024/11/12	Hyderbad	Mobile	online data analytic
A1010	DataAnalyticsCourse	101	5399	$236.79	20	6	0.059	$1900	14-11-2024	HYDERABAD	DESKTOP	learn data analytics
A1011	Data Analytics Corse	101	3613	$208.12	24	5	0.05	$1130	2024/11/22	hyderabad	Desktop	online data analytic

```
DESC ads_data;
```

Result Grid | Filter Rows: | Export:

Field	Type	Null	Key	Default	Extra
Ad_ID	text	YES		NULL	
Campaign_Name	text	YES		NULL	
Clicks	double	YES		NULL	
Impressions	double	YES		NULL	
Cost	text	YES		NULL	
Leads	double	YES		NULL	
Conversions	double	YES		NULL	
Conversion Rate	text	YES		NULL	
Sale_Amount	text	YES		NULL	
Ad_Date	text	YES		NULL	
Location	text	YES		NULL	
Device	text	YES		NULL	
Keyword	text	YES		NULL	

INSIGHTS

- **Using the first query, we identified the number of columns in the dataset and checked for the presence of null values.**

- **The second query provided a description of the dataset. It revealed that all columns were imported as text format.**

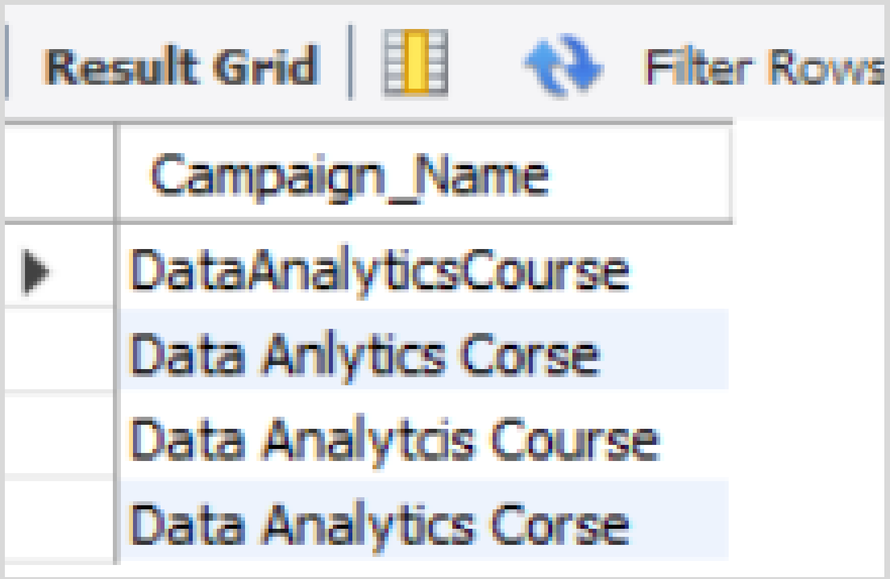
- **According to the query results, no null values were detected. However, this contradicts our observation of blank cells in the dataset.**

- **We concluded that since the columns were imported as text, the blank cells were interpreted as empty strings rather than null values during the import process.**

DATA PREPROCESSING

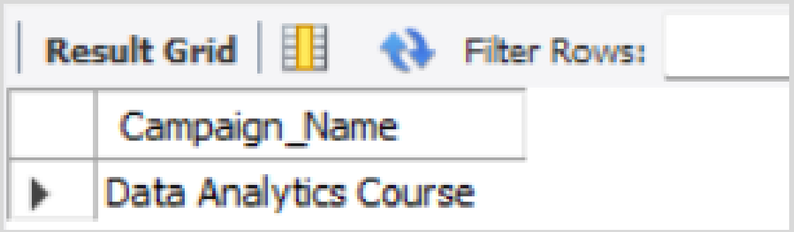
```sql
SELECT Distinct Campaign_Name
FROM ads_data;
```

```sql
UPDATE ads_data
SET Campaign_Name = "Data Analytics Course";
```



Result Grid | Filter Rows

Campaign_Name
DataAnalyticsCourse
Data Anlytics Corse
Data Analytcis Course
Data Analytics Corse



Result Grid | Filter Rows:

Campaign_Name
Data Analytics Course

```sql
SELECT DISTINCT Location
FROM ads_data;
```

```sql
UPDATE ads_data
SET Location = 'Hyderabad';
```

Result Grid | Filter R

Location
hyderabad
Hyderbad
hydrebad

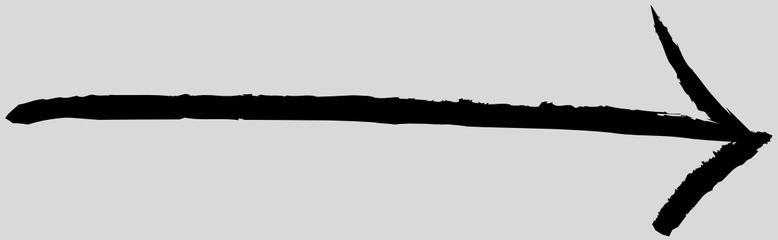
Result Grid

Location
Hyderabad

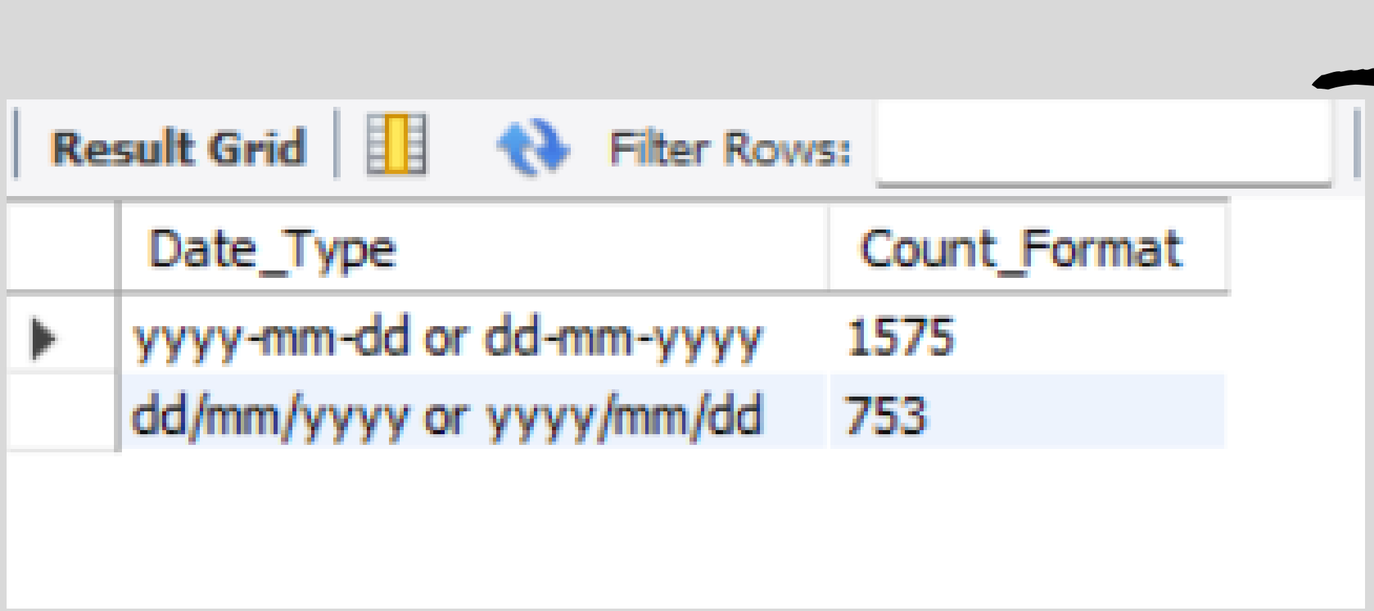
```sql
SELECT DISTINCT Ad_Date
FROM ads_data;
```

Result Grid | Filte

Ad_Date
2024-11-16
20-11-2024
2024/11/16
2024-11-26
2024-11-22
16-11-2024
06-11-2024
2024/11/24
2024/11/12
14-11-2024
2024/11/22
2024/11/27
12-11-2024
2024-11-04



```sql
SELECT
CASE
 WHEN Ad_Date LIKE '%-%' AND LENGTH(AD_Date)=10 THEN 'yyyy-mm-dd or dd-mm-yyyy'
 WHEN Ad_Date LIKE '%/%' AND LENGTH(AD_Date)=10 THEN 'dd/mm/yyyy or yyyy/mm/dd'
 ELSE 'UNKNOWN'
END AS 'Date_Type',
COUNT(*) as Count_Format
FROM ads_data
GROUP BY Date_Type;
```



Result Grid | Filter Rows:

Date_Type	Count_Format
yyyy-mm-dd or dd-mm-yyyy	1575
dd/mm/yyyy or yyyy/mm/dd	753

```sql
ALTER TABLE ads_data ADD COLUMN Format_Date DATE;

UPDATE ads_data
SET Format_Date =
CASE
 WHEN Ad_Date LIKE "%-%" AND SUBSTRING(Ad_Date,3,1) ='-'
   THEN STR_TO_DATE(Ad_Date, '%d-%m-%Y')
 WHEN Ad_Date LIKE "%-%" AND SUBSTRING(Ad_Date, 5,1) ='-'
   THEN STR_TO_DATE(AD_Date, "%Y-%m-%d")
 WHEN Ad_Date LIKE "%/%" AND SUBSTRING(Ad_Date,3,1)='/'
   THEN STR_TO_DATE(Ad_Date, "%d/%m/%Y")
 WHEN Ad_Date LIKE "%/%" AND SUBSTRING(Ad_Date,5,1)='/'
   THEN STR_TO_DATE(AD_Date,  "%Y/%m/%d")
 ELSE NULL
 END;
```

```sql
SELECT Ad_date, Format_Date
FROM ads_data
```

Result Grid | Filter Rows:

Ad_date	Format_Date
2024-11-16	2024-11-16
20-11-2024	2024-11-20
2024/11/16	2024-11-16
2024-11-26	2024-11-26
2024-11-22	2024-11-22
16-11-2024	2024-11-16

```sql
SELECT DISTINCT Clicks, Conversions, Conversion_Rate
FROM ads_data;
```

Result Grid | Filter Rows:

Clicks	Conversions	Conversion_Rate
104	7	0.058
173	8	0.046
90	9	
142	6	
156	8	
195	8	

```sql
SELECT Conversion_Rate
FROM ads_data
WHERE (Conversions/Clicks) is NULL;

UPDATE ads_data
SET Conversion_Rate = NULL
WHERE Conversion_Rate = '';


SELECT COUNT(*) as No_CR
FROM ads_data
Where Conversion_Rate is NULL;
```

Result Grid

No_CR
458

```sql
UPDATE ads_data
SET Conversion_Rate = Conversions/Clicks
WHERE Conversion_Rate is NULL;
```

```sql
UPDATE ads_data
SET Conversion_Rate = ROUND(Conversion_Rate,2);
```

Result Grid | Filter Rows:

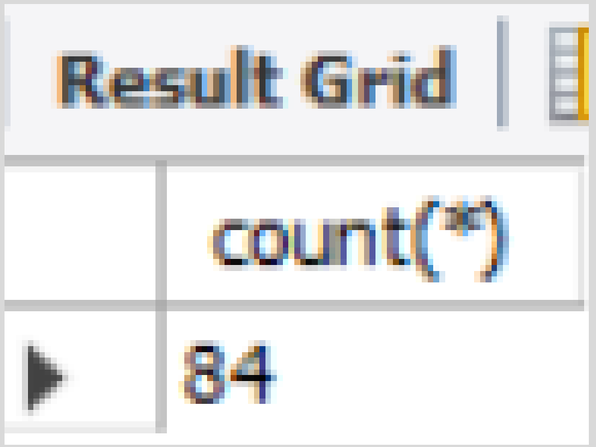
Clicks	Conversions	Conversion_Rate
104	7	0.058
173	8	0.046
90	9	0.1
142	6	0.04225352112676056
156	8	0.05128205128205128
195	8	0.04102564102564102

Result Grid | Filter Rows:

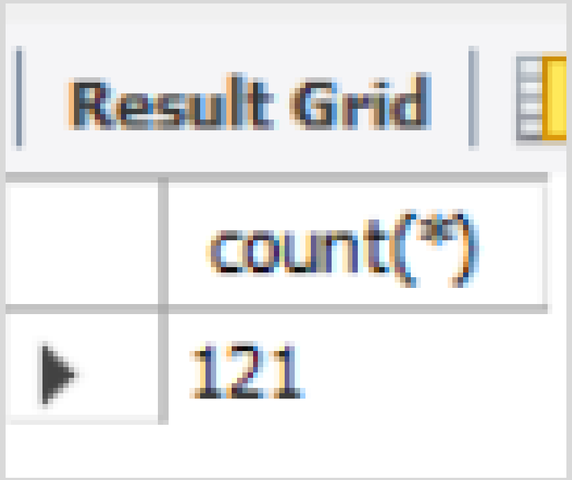
Clicks	Conversions	Conversion_Rate
104	7	0.06
173	8	0.05
90	9	0.1
142	6	0.04
156	8	0.05
195	8	0.04

```sql
UPDATE ads_data    # performed same for sales_amount
SET Cost = NULL
WHERE Cost = '';

Select count(*)
from ads_data
where Cost is NULL;
```



```sql
Select count(*)
from ads_data
where Sale_Amount is NULL;
```



```sql
UPDATE ads_data
SET Cost = REPLACE(REPLACE(Cost, '$', ''), ',', '');
```

```sql
UPDATE ads_data
SET Sale_Amount = REPLACE(Sale_Amount, '$', '');
```

Result Grid

	cost
▶	231.88
	216.84
	203.66
	237.66
	195.9
	243.57
	237.79

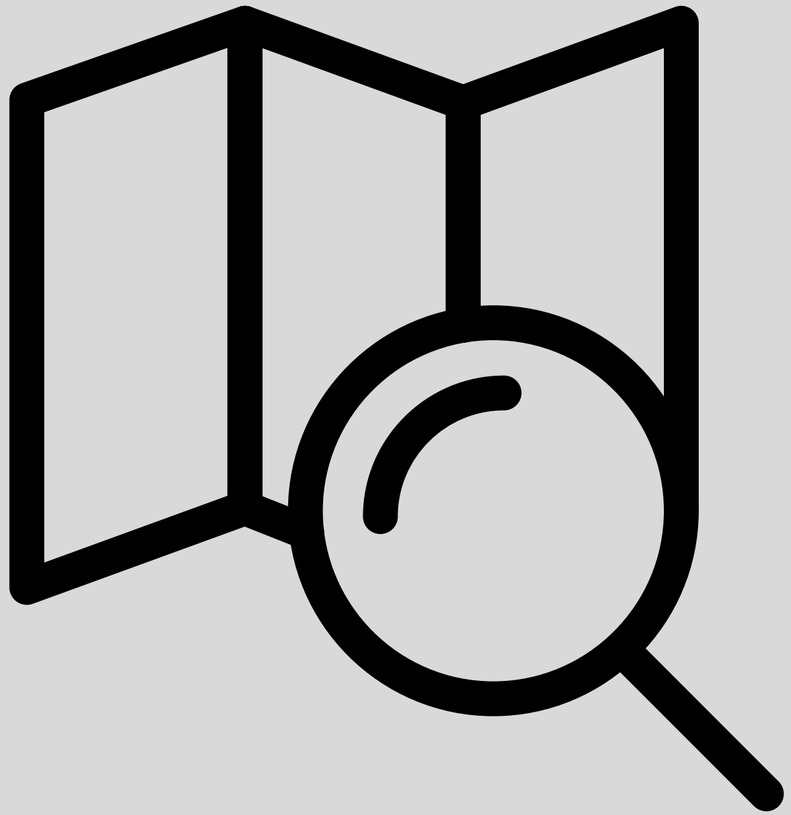
Result Grid

	Sale_Amount
▶	1892
	1679
	1624
	1225
	1091
	1315
	1640

PROCESS SUMMARY

- Typos corrected by updating table columns such as Campaign Name and Location.
- Ads_date column had inconsistent formats (e.g., dd-mm-yyyy, yyyy-mm-dd, dd/mm/yyyy). A new column was created with a standardized format (dd-mm-yyyy).
- Missing data in the Conversion Rate, Cost, and Sale Amount columns was explicitly treated as NULL.
- Conversion Rate nulls were imputed using the formula: Conversion Rate = Conversions/Clicks
- Cost and Sale Amount columns were standardized by removing the dollar sign for easier analysis.

DATA EXPLORATION AND ANALYSIS



```sql
SELECT COUNT(*)
FROM ads_data
WHERE COST > (SELECT AVG(COST) FROM ads_data)
```

```sql
SELECT COUNT(*)
FROM ads_data
WHERE Sale_Amount > (SELECT AVG(Sale_Amount) FROM ads_data);
```

Result Grid

	COUNT(*)
▶	1137

Result Grid

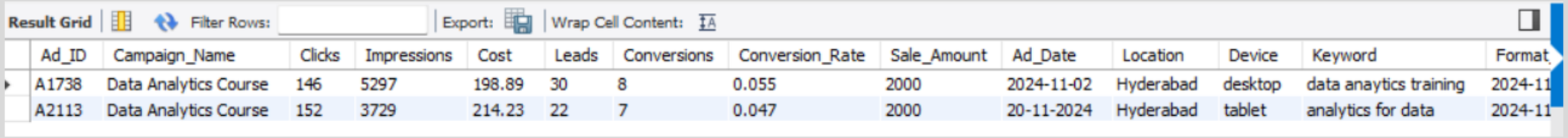
	COUNT(*)
▶	1119

```sql
SELECT DISTINCT (Keyword)
FROM ads_data;
```

Result Grid | Filter Rov

Keyword
learn data analytics
data analytics course
data analitics online
data anaytics training
online data analytic
analytics for data

```sql
SELECT *
FROM ads_data
WHERE Sale_Amount =( SELECT max(Sale_Amount) From ads_data);
```



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

Ad_ID	Campaign_Name	Clicks	Impressions	Cost	Leads	Conversions	Conversion_Rate	Sale_Amount	Ad_Date	Location	Device	Keyword	Format
A1738	Data Analytics Course	146	5297	198.89	30	8	0.055	2000	2024-11-02	Hyderabad	desktop	data anaytics training	2024-11
A2113	Data Analytics Course	152	3729	214.23	22	7	0.047	2000	20-11-2024	Hyderabad	tablet	analytics for data	2024-11

```sql
SELECT DISTINCT(keyword), SUM(COST) as "Total_Cost_per_keyword"
FROM ads_data
GROUP BY keyword
ORDER BY Total_Cost_per_keyword;
```

Result Grid | Filter Rows:

keyword	Total_Cost_per_keyword
data anaytics training	75350.27
data analitics online	75405.81
analytics for data	80490.42
data analytics course	80714.94
online data analytic	85111.19
learn data analytics	85868.69

```sql
SELECT DISTINCT(keyword), SUM(Sale_Amount) as "Total_Saleamt_per_keyword"
FROM ads_data
GROUP BY keyword
ORDER BY Total_Saleamt_per_keyword;
```

Result Grid | Filter Rows:

keyword	Total_Saleamt_per_keyword
data analitics online	512179
data anaytics training	520336
analytics for data	553436
data analytics course	561990
online data analytic	565734
learn data analytics	586351

```sql
SELECT KEYWORD,
SUM(Sale_Amount - Cost) as Profit
FROM ads_data
GROUP BY keyword
ORDER BY Profit;
```

Result Grid | Filter Rows:

KEYWORD	Profit
data analitics online	419087.42
data anaytics training	431650.24
analytics for data	453413.16
online data analytic	461426.33
data analytics course	470061.54
learn data analytics	487081.70

```sql
SELECT Keyword,
SUM(Clicks) as "TOTAL_CLICKS",
SUM(Conversions) as "TOTAL_CONV"
FROM ads_data
GROUP BY Keyword
ORDER BY TOTAL_CLICKS DESC, TOTAL_CONV ASC;
```

Result Grid | Filter Rows: | Expo

Keyword	TOTAL_CLICKS	TOTAL_CONV
online data analytic	56972	2715
learn data analytics	55364	2651
data analytics course	55022	2552
analytics for data	53757	2464
data analitics online	51641	2327
data anaytics training	50803	2429

```sql
SELECT Device,
MAX(COST) as "Max_Cost",
MAX(Sale_Amount) as "Max_Sale",
Max(Clicks) as "Max_Clicks"
FROM ads_data
GROUP BY Device;
```

Result Grid   Filter Rows:

Device	Max_Cost	Max_Sale	Max_Clicks
desktop	249.74	2000	199
mobile	249.88	1996	199
tablet	249.89	2000	199

```sql
SELECT Device,
SUM(COST) as "Total_Cost",
SUM(Sale_Amount) as "Total_Sale",
SUM(Clicks) as "Total_Clicks"
FROM ads_data
GROUP BY Device
ORDER BY Total_Clicks ASC;
```

Result Grid | Filter Rows:

Device	Total_Cost	Total_Sale	Total_Clicks
tablet	152641.20	1052651	103179
desktop	163398.31	1121578	108643
mobile	166901.81	1125797	111737

```sql
SELECT DATE_FORMAT(STR_TO_DATE( Format_Date, '%Y-%m-%d'), '%Y-%m') AS Month,
SUM(Sale_Amount) AS Total_Revenue
FROM ads_data
GROUP BY Month
ORDER BY Month;
```

Result Grid | Filter Rows:

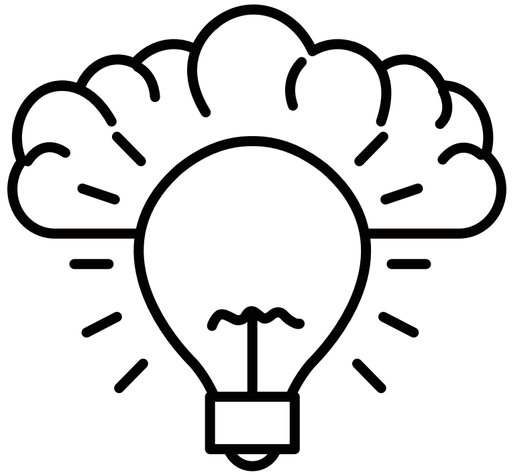
Month	Total_Revenue
2024-11	3300026

```sql
SELECT DAYNAME(STR_TO_DATE(Format_Date, '%Y-%m-%d')) AS Weekday,
SUM(Sale_Amount) AS Total_Revenue
FROM ads_data
GROUP BY Weekday
ORDER BY Total_Revenue DESC;
```

Result Grid | Filter Rows:

Weekday	Total_Revenue
Saturday	533671
Friday	533057
Thursday	481401
Monday	464340
Tuesday	451834
Wednesday	432479
Sunday	403244

INTERPRETATION



***Clicks vs. Conversions*:**

- **A High number of clicks confirms correct data capture, but clicks do not strongly translate into purchases.**

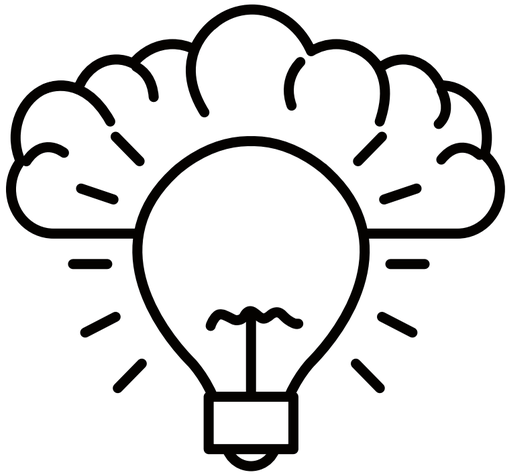
Cost & Sales Distribution:

- **Out of 2,328 rows, 1,137 have cost above the average (215.21).**
- **1,119 rows have sales above the average (1,495.25).**

Keywords:

- **6 keywords significantly impact sales.**
- **Highest cost ads → “learn data analytics”, “online data analytics”.**
- **Lowest cost ads → “data analytics training”, “data analitics online”.**
- **Highest profit → “learn data analytics”, followed by “data analytics course” and “online data analytic”.**
- **Lowest profit → “data analitics online”, “data analytics training”, “analytics for data”.**

INTERPRETATION



Ad Performance:

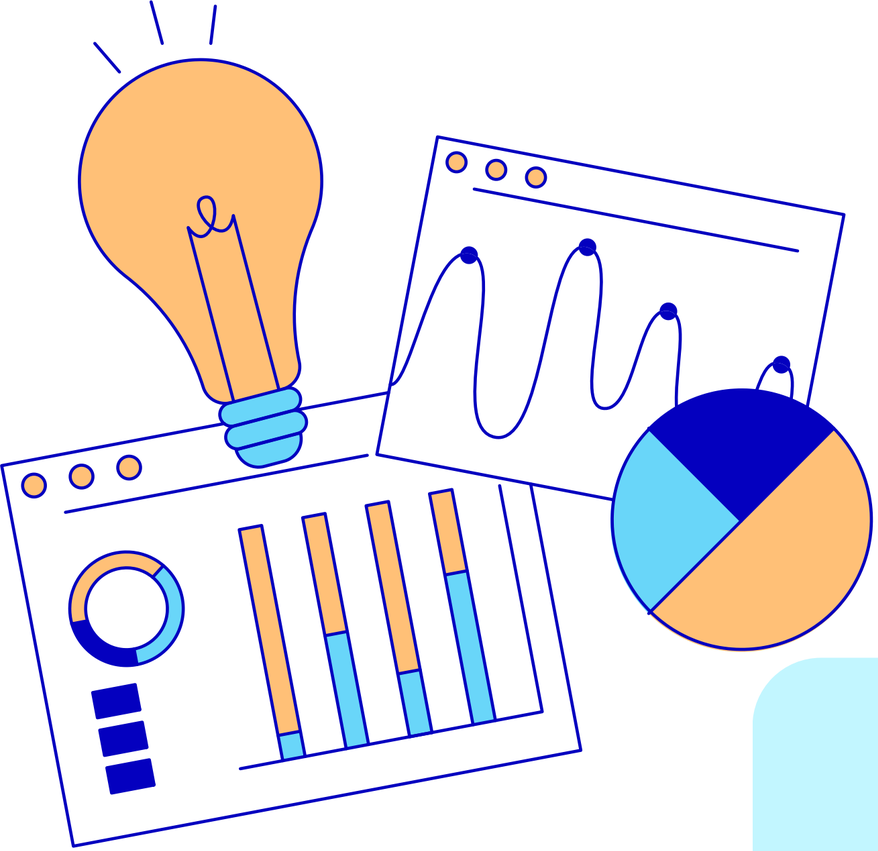
- **Ad A1738 and Ad A2113 recorded max sale amounts (2,000) on Nov 2, 2024 and Nov 20, 2024 respectively.**
- **A1738 earned higher profit due to lower cost.**
- **None of the ads ran at a loss (all costs were recovered).**

***Device-wise Trends*:**

- **Cost is almost equal across devices; max clicks capped at 199.**
- **Highest sales → Desktop & Tablet (2,000 each).**
- **Highest cost, sales, and clicks overall → Mobile, followed by Desktop, then Tablet.**

Time-based Trends:

- **Data only available for November 2024.**
- **Saturday generated max revenue, followed by Friday.**
- **Sunday had the lowest revenue.**



TABLEAU

Dataset Manipulated via MySQL
was visualized using Tableau
Link:
https://public.tableau.com/app/profile/pranamya6125/vizzes

THANKYOU