

PROJECT : 3

Operation Analytics and Investigating Metric Spike

- **Description:**

In this project, the data analyst is expected to deal with marketing, operational and support team to derive valuable insights.

This involves understanding and explaining sudden changes in key metrics, such as a dip in daily user engagement or a drop in sales. As a Data Analyst, you'll need to answer these questions daily, making it crucial to understand how to investigate these metric spikes.

- **Approach :**

Make the database as project_3 by inputting the data collected.

```
create database project_3;
```

```
CREATE TABLE job_data (
```

```
    ds DATE,
```

```
    job_id INT NOT NULL,
```

```
    actor_id INT NOT NULL,
```

```
    Event VARCHAR(15) NOT NULL,
```

```
    language VARCHAR(15) NOT NULL,
```

```
    time_spent INT NOT NULL,
```

```
    org CHAR(2)
```

```
);
```

```
INSERT INTO job_data (ds, job_id, actor_id,event,language,time_spent,org)
```

```
values ('2020-11-30', 21, 1001,"skip","English",15, "A"),
```

```
('2020-11-30',22,1006,'transfer','Arabic',25,'B'),
```

```
('2020-11-29',23,1003,'decision','Persian', 20, 'C'),
```

```
('2020-11-28',23,1005,'transfer','Persian',22,'D'),
```

```
('2020-11-28',25,1002,'decision','Hindi',11,'B'),
```

```
('2020-11-27',11,1007,'decision','French',104,'D'),  
('2020-11-26',23,1004,'skip','Persian',56,'A'),  
('2020-11-25',20,1003,'transfer','Italian',45,'C');
```

Case study 1:

- A. **Objective:** Calculate the number of jobs reviewed per hour for each day in November 2020.
1. Filter the data
 2. Extracted the hour and date using Mysql query
 3. Group by date and hour, then counted the number of jobs.

SQL Query:

```
SELECT  
    DATE(ds) AS review_date,  
    HOUR(ds) AS review_hour,  
    COUNT(*) AS jobs_reviewed  
FROM  
    job_data  
WHERE  
    ds BETWEEN '2020-11-01' AND '2020-11-30'  
GROUP BY  
    review_date, review_hour  
ORDER BY  
    review_date, review_hour;
```

Review_date	Review_hour	Jobs_reviewed
2020-11-25	0	1
2020-11-26	0	1
2020-11-27	0	1
2020-11-28	0	2
2020-11-29	0	1
2020-11-30	0	2

B. OBJECTIVE: Calculate the 7-day rolling average of throughput (number of events per second).

Throughput analysis refers to the rate at which events or transactions are processed per second or per minute.

It is crucial to understand because it helps in identifying bottlenecks, peaks, usage time and overall systems performance.

SQL QUERY:

SELECT

ROUND(COUNT(job_id) / SUM(time_spent), 2) AS `weekly throughput`

FROM

job_data;

Output:

weekly throughput

0.03

select

ds As dates, Round(count(event)/sum(time_spent),2) As 'daily throughput'

FROM job_data

Group by ds Order By ds;

Output:

Dates	daily throughput
2020-11-25	0.02
2020-11-26	0.02
2020-11-27	0.01
2020-11-28	0.06
2020-11-29	0.05
2020-11-30	0.05

Insight:

I would prefer seven day rolling average over daily throughput because it provides clearer insights ignoring the daily fluctuations which results in better understanding.

C. OBJECTIVE: Language share analysis:

Calculate the percentage share of each language in the last 30 days.

```
SELECT
    language AS Languages,
    ROUND(100 * COUNT(*) / total, 2) AS percentage,
    sub.total
FROM
    job_data
    CROSS JOIN
    (SELECT
        COUNT(*) AS total
    FROM
        job_data) AS sub
GROUP BY language , sub.total;
```

Output:

Languages	percentage	total
English	12.50	8
Arabic	12.50	8
Persian	37.50	8
Hindi	12.50	8
French	12.50	8
Italian	12.50	8

D. OBJECTIVE: Duplicate row detection:

Identify duplicate rows in the data.

SELECT

actor_id, COUNT(*) AS duplicate

FROM

Job_data

GROUP BY actor_id

HAVING COUNT(*) > 1;

Output:

Actor_id duplicate

1003

2

The screenshot shows the MySQL Workbench interface. The query editor displays the following SQL query:

```
SELECT
  actor_id, COUNT(*) AS duplicate
FROM
  Job_data
GROUP BY actor_id
HAVING COUNT(*) > 1;
```

The query results are shown in the Result Grid, displaying two columns: actor_id and duplicate. The result for actor_id 1003 is 2.

actor_id	duplicate
1003	2

The Output pane shows the execution log, indicating that the query was executed successfully and returned 1 row(s).

CASE STUDY 2:

INVESTIGATING METRIC SPIKE

Following are the steps to create database and loading long files on MySql:

```
create database project3_2;
```

```
use project3_2;
```

```
# table-1 users
```

```
CREATE TABLE users (  
    user_id INT,  
    created_at VARCHAR(100),  
    company_id INT,  
    language VARCHAR(50),  
    activated_at VARCHAR(100),  
    state VARCHAR(50)  
);
```

```
show variables like 'secure_file_priv';
```

```
load data infile "C:/ProgramData/MySQL/MySQL Server  
8.0/Uploads/users.csv"
```

```
into table users
```

```
fields terminated by ','
```

```
enclosed by '"'
```

```
lines terminated by '\n'
```

```
ignore 1 lines;
```

```
alter table users add column temp_created_at datetime;
```

```
UPDATE users
```

```
SET
```

```
temp_created_at = STR_TO_DATE(created_at, '%d-%m-%Y %H:%i');
```

```
alter table users drop column created_at;
```

```
alter table users change column temp_created_at created_at datetime;
```

```
alter table users add column temp_activated_at datetime;
```

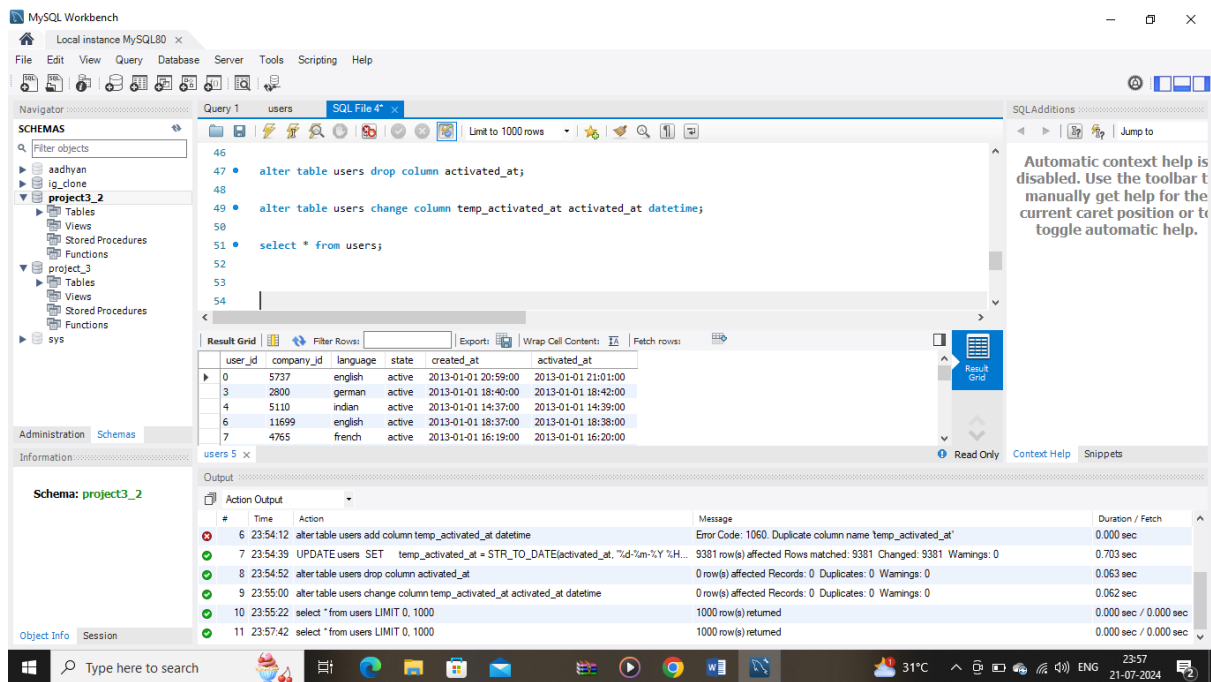
```
UPDATE users
```

```
SET
```

```
temp_activated_at = STR_TO_DATE(activated_at, '%d-%m-%Y %H:%i');
```

```
alter table users drop column activated_at;
```

```
alter table users change column temp_activated_at activated_at datetime;
```



Similarly followed steps for table 2 #events and table 3 #email_events.

A. OBJECTIVE: Weekly user engagement:

Measure the activeness of users on a weekly basis.

SELECT

YEARWEEK(event_date, 1) AS week,

COUNT(DISTINCT user_id) AS active_users

FROM

events

GROUP BY

week

ORDER BY

week;

output:

Week_number	active_users
17	663
18	1068
19	1113
20	1154
21	1121
22	1186
23	1232
24	1275
25	1264
26	1302
27	1372
28	1365
29	1376
30	1467
31	1299
32	1225
33	1225
34	1204
35	104

Maximum users: week 30

Minimum users: week 35

The screenshot shows the MySQL Workbench interface. The left sidebar displays the 'SCHEMAS' tree with 'project3_2' selected. The main editor window contains a SQL query:


```

1 use project3_2;
2 #task 1
3 select extract(week from occurred_at) as week_number,
4 count(distinct user_id) as active_user
5 from events
6 where event_type='engagement'
7 group by week_number
8 order by week_number;
  
```

 The 'Result Grid' shows the output of the query:

week_number	active_user
17	663
18	1068
19	1113
20	1154
21	1121

 The bottom panel shows the 'Action Output' with a list of database actions and their execution details, including timestamps, actions performed, and messages. The status bar at the bottom indicates the system time as 01:05 on 22-07-2024.

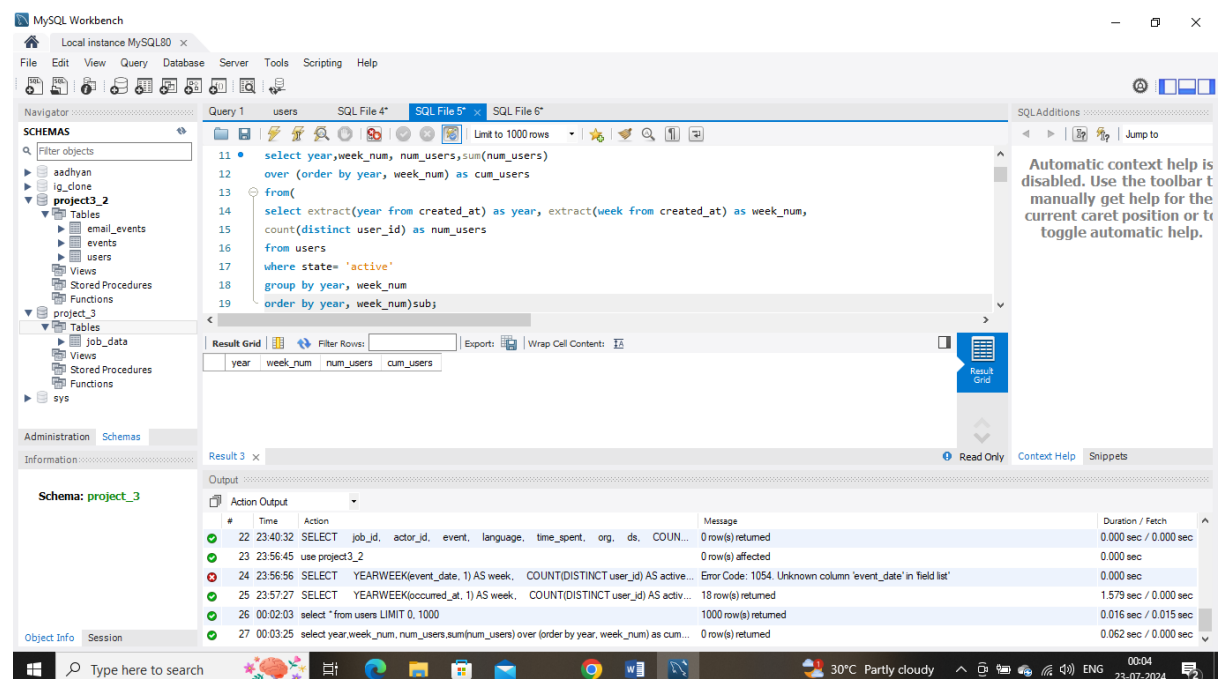
B. OBJECTIVE: User Growth Analysis:

Objective: Analyse the growth of users over time for a product.

SQL Query:

```
select year,week_num, num_users,sum(num_users)
over (order by year, week_num) as cum_users
from(
select extract(year from created_at) as year, extract(week from created_at) as
week_num,
count(distinct user_id) as num_users
from users
where state= 'active'
group by year, week_num
order by year, week_num)sub;
```

output:



The screenshot shows the MySQL Workbench interface. The SQL Editor contains the following query:

```
11 select year,week_num, num_users,sum(num_users)
12 over (order by year, week_num) as cum_users
13 from(
14 select extract(year from created_at) as year, extract(week from created_at) as week_num,
15 count(distinct user_id) as num_users
16 from users
17 where state= 'active'
18 group by year, week_num
19 order by year, week_num)sub;
```

The Results window shows the output of the query. The columns are year, week_num, num_users, and cum_users. The output is empty, indicating that no rows were returned.

year	week_num	num_users	cum_users
------	----------	-----------	-----------

The Output window shows the execution log. The last row indicates that 0 rows were returned.

#	Time	Action	Message	Duration / Fetch
22	23:40:32	SELECT job_id, actor_id, event, language, time_spent, org, ds, COUNT...	0 row(s) returned	0.000 sec / 0.000 sec
23	23:56:45	use project3_2	0 row(s) affected	0.000 sec
24	23:56:56	SELECT YEARWEEK(event_date, 1) AS week, COUNT(DISTINCT user_id) AS active...	Error Code: 1054. Unknown column 'event_date' in field list	0.000 sec
25	23:57:27	SELECT YEARWEEK(occurred_at, 1) AS week, COUNT(DISTINCT user_id) AS activ...	18 row(s) returned	1.579 sec / 0.000 sec
26	00:02:03	select * from users LIMIT 0, 1000	1000 row(s) returned	0.016 sec / 0.015 sec
27	00:03:25	select year,week_num, num_users,sum(num_users) over (order by year, week_num) as cum...	0 row(s) returned	0.062 sec / 0.000 sec

NO ROW IS RETURNED.

C. OBJECTIVE: Weekly Retention Analysis:

Analyse the retention of users on a weekly basis after signing up for a product.

SQL QUERY:

```
WITH cte1 AS (  
    SELECT DISTINCT user_id,  
        EXTRACT(WEEK FROM occurred_at) AS sign_up_week  
    FROM events  
    WHERE event_type = 'signup_flow'  
    AND event_name = 'complete_signup'  
    AND EXTRACT(WEEK FROM occurred_at) = 18  
)  
cte2 AS (  
    SELECT DISTINCT user_id,  
        EXTRACT(WEEK FROM occurred_at) AS engagement_week  
    FROM events  
    WHERE event_type = 'engagement'  
)  
SELECT COUNT(user_id) AS total_engaged_users,  
    SUM(CASE WHEN retention_week > 8 THEN 1 ELSE 0 END) AS retained_users  
FROM (  
    SELECT a.user_id,  
        a.sign_up_week,  
        b.engagement_week,  
        b.engagement_week - a.sign_up_week AS retention_week  
    FROM cte1 a  
    LEFT JOIN cte2 b ON a.user_id = b.user_id  
    ORDER BY a.user_id  
) sub;
```

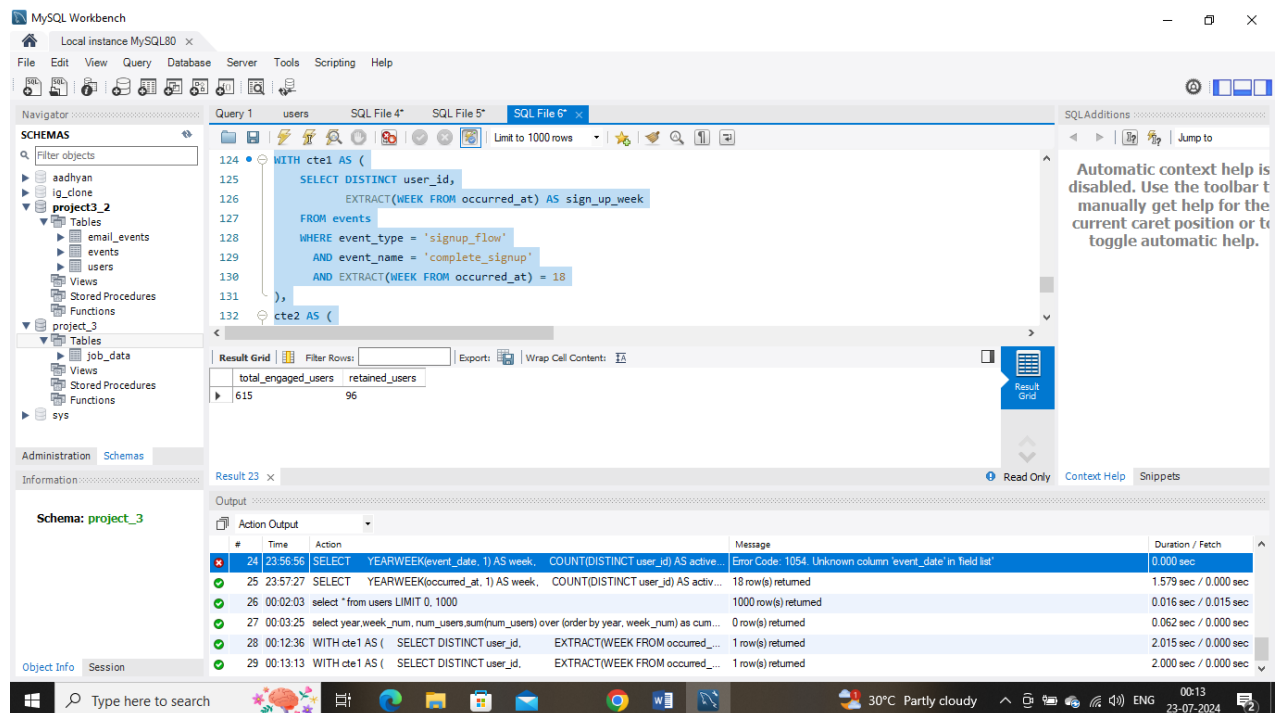
Output

Total_engaged_users

retained_users

615

96



D. OBJECTIVE: Weekly Engagement per device:

Measure the activeness of users on a weekly basis per device

WITH cte AS (
 SELECT

CONCAT(EXTRACT(YEAR FROM occurred_at), '-', EXTRACT(WEEK

FROM occurred_at)) AS week_num,
 device,

COUNT(DISTINCT user_id) AS user_count

FROM

events

WHERE

```

        event_type = 'engagement'
    GROUP BY
        week_num, device
)
SELECT
    week_num,
    device,
    user_count
FROM
    cte
ORDER BY
    week_num, device;

```

Output:

week_num	device	user_count
2014-17	acer aspire desktop	9
2014-17	acer aspire notebook	20
2014-17	amazon fire phone	4
2014-17	asus chromebook	21
2014-17	dell inspiron desktop	18
2014-17	dell inspiron notebook	46
2014-17	hp pavilion desktop	14
2014-17	htc one	16
2014-17	ipad air	27
2014-17	ipad mini	19
2014-17	iphone 4s	21
2014-17	iphone 5	65
2014-17	iphone 5s	42
2014-17	kindle fire	6
2014-17	lenovo thinkpad	86
2014-17	mac mini	6
2014-17	macbook air	54
2014-17	macbook pro	143
2014-17	nexus 10	16

2014-17	nexus 5	40
2014-17	nexus 7	18
2014-17	nokia lumia 635	17
2014-17	samsung galaxy tablet	8
2014-17	samsung galaxy note	7
2014-17	samsung galaxy s4	52
2014-17	windows surface	10
2014-18	acer aspire desktop	26
2014-18	acer aspire notebook	33
2014-18	amazon fire phone	9
2014-18	asus chromebook	42
2014-18	dell inspiron desktop	58
2014-18	dell inspiron notebook	77
2014-18	hp pavilion desktop	37
2014-18	htc one	19
2014-18	ipad air	52
2014-18	ipad mini	30
2014-18	iphone 4s	46
2014-18	iphone 5	113
2014-18	iphone 5s	73
2014-18	kindle fire	27
2014-18	lenovo thinkpad	153
2014-18	mac mini	13
2014-18	macbook air	121
2014-18	macbook pro	252
2014-18	nexus 10	30
2014-18	nexus 5	73
2014-18	nexus 7	30
2014-18	nokia lumia 635	33
2014-18	samsung galaxy tablet	11
2014-18	samsung galaxy note	15
2014-18	samsung galaxy s4	82
2014-18	windows surface	10
2014-19	acer aspire desktop	23
2014-19	acer aspire notebook	41
2014-19	amazon fire phone	12
2014-19	asus chromebook	27
2014-19	dell inspiron desktop	36
2014-19	dell inspiron notebook	83
2014-19	hp pavilion desktop	40
2014-19	htc one	30

2014-19	ipad air	55
2014-19	ipad mini	36
2014-19	iphone 4s	44
2014-19	iphone 5	115
2014-19	iphone 5s	79
2014-19	kindle fire	21
2014-19	lenovo thinkpad	178
2014-19	mac mini	18
2014-19	macbook air	112
2014-19	macbook pro	266
2014-19	nexus 10	25
2014-19	nexus 5	87
2014-19	nexus 7	41
2014-19	nokia lumia 635	23
2014-19	samsung galaxy tablet	6
2014-19	samsung galaxy note	11
2014-19	samsung galaxy s4	91
2014-19	windows surface	16
2014-20	acer aspire desktop	23
2014-20	acer aspire notebook	40
2014-20	amazon fire phone	11
2014-20	asus chromebook	41
2014-20	dell inspiron desktop	52
2014-20	dell inspiron notebook	84
2014-20	hp pavilion desktop	30
2014-20	htc one	29
2014-20	ipad air	59
2014-20	ipad mini	32
2014-20	iphone 4s	55
2014-20	iphone 5	125
2014-20	iphone 5s	79
2014-20	kindle fire	23
2014-20	lenovo thinkpad	173
2014-20	mac mini	26
2014-20	macbook air	119
2014-20	macbook pro	256
2014-20	nexus 10	22
2014-20	nexus 5	103
2014-20	nexus 7	32
2014-20	nokia lumia 635	22
2014-20	samsung galaxy tablet	9

2014-20	samsung galaxy note	18
2014-20	samsung galaxy s4	93
2014-20	windows surface	21
2014-21	acer aspire desktop	29
2014-21	acer aspire notebook	47
2014-21	amazon fire phone	5
2014-21	asus chromebook	38
2014-21	dell inspiron desktop	41
2014-21	dell inspiron notebook	80
2014-21	hp pavilion desktop	44
2014-21	htc one	21
2014-21	ipad air	51
2014-21	ipad mini	23
2014-21	iphone 4s	45
2014-21	iphone 5	137
2014-21	iphone 5s	74
2014-21	kindle fire	30
2014-21	lenovo thinkpad	167
2014-21	mac mini	18
2014-21	macbook air	110
2014-21	macbook pro	247
2014-21	nexus 10	25
2014-21	nexus 5	91
2014-21	nexus 7	29
2014-21	nokia lumia 635	25
2014-21	samsung galaxy tablet	6
2014-21	samsung galaxy note	20
2014-21	samsung galaxy s4	84
2014-21	windows surface	17
2014-22	acer aspire desktop	25
2014-22	acer aspire notebook	41
2014-22	amazon fire phone	5
2014-22	asus chromebook	52
2014-22	dell inspiron desktop	52
2014-22	dell inspiron notebook	92
2014-22	hp pavilion desktop	38
2014-22	htc one	24
2014-22	ipad air	58
2014-22	ipad mini	34
2014-22	iphone 4s	45
2014-22	iphone 5	125

2014-22	iphone 5s	71
2014-22	kindle fire	21
2014-22	lenovo thinkpad	176
2014-22	mac mini	25
2014-22	macbook air	145
2014-22	macbook pro	251
2014-22	nexus 10	27
2014-22	nexus 5	96
2014-22	nexus 7	45
2014-22	nokia lumia 635	25
2014-22	samsung galaxy tablet	10
2014-22	samsung galaxy note	19
2014-22	samsung galaxy s4	105
2014-22	windows surface	15
2014-23	acer aspire desktop	22
2014-23	acer aspire notebook	43
2014-23	amazon fire phone	16
2014-23	asus chromebook	49
2014-23	dell inspiron desktop	53
2014-23	dell inspiron notebook	103
2014-23	hp pavilion desktop	54
2014-23	htc one	20
2014-23	ipad air	41
2014-23	ipad mini	33
2014-23	iphone 4s	53
2014-23	iphone 5	152
2014-23	iphone 5s	79
2014-23	kindle fire	25
2014-23	lenovo thinkpad	176
2014-23	mac mini	18
2014-23	macbook air	124
2014-23	macbook pro	266
2014-23	nexus 10	45
2014-23	nexus 5	88
2014-23	nexus 7	36
2014-23	nokia lumia 635	31
2014-23	samsung galaxy tablet	14
2014-23	samsung galaxy note	14
2014-23	samsung galaxy s4	99
2014-23	windows surface	14
2014-24	acer aspire desktop	24

2014-24	acer aspire notebook	40
2014-24	amazon fire phone	11
2014-24	asus chromebook	43
2014-24	dell inspiron desktop	59
2014-24	dell inspiron notebook	99
2014-24	hp pavilion desktop	56
2014-24	htc one	20
2014-24	ipad air	57
2014-24	ipad mini	39
2014-24	iphone 4s	53
2014-24	iphone 5	142
2014-24	iphone 5s	79
2014-24	kindle fire	25
2014-24	lenovo thinkpad	165
2014-24	mac mini	29
2014-24	macbook air	152
2014-24	macbook pro	255
2014-24	nexus 10	38
2014-24	nexus 5	87
2014-24	nexus 7	49
2014-24	nokia lumia 635	35
2014-24	samsung galaxy tablet	11
2014-24	samsung galaxy note	20
2014-24	samsung galaxy s4	101
2014-24	windows surface	22
2014-25	acer aspire desktop	28
2014-25	acer aspire notebook	47
2014-25	amazon fire phone	13
2014-25	asus chromebook	38
2014-25	dell inspiron desktop	52
2014-25	dell inspiron notebook	105
2014-25	hp pavilion desktop	52
2014-25	htc one	21
2014-25	ipad air	57
2014-25	ipad mini	30
2014-25	iphone 4s	40
2014-25	iphone 5	137
2014-25	iphone 5s	78
2014-25	kindle fire	24
2014-25	lenovo thinkpad	197
2014-25	mac mini	21

2014-25	macbook air	121
2014-25	macbook pro	275
2014-25	nexus 10	29
2014-25	nexus 5	89
2014-25	nexus 7	51
2014-25	nokia lumia 635	37
2014-25	samsung galaxy tablet	12
2014-25	samsung galaxy note	14
2014-25	samsung galaxy s4	99
2014-25	windows surface	22
2014-26	acer aspire desktop	29
2014-26	acer aspire notebook	35
2014-26	amazon fire phone	13
2014-26	asus chromebook	49
2014-26	dell inspiron desktop	60
2014-26	dell inspiron notebook	89
2014-26	hp pavilion desktop	46
2014-26	htc one	23
2014-26	ipad air	56
2014-26	ipad mini	43
2014-26	iphone 4s	50
2014-26	iphone 5	152
2014-26	iphone 5s	94
2014-26	kindle fire	26
2014-26	lenovo thinkpad	192
2014-26	mac mini	11
2014-26	macbook air	134
2014-26	macbook pro	269
2014-26	nexus 10	29
2014-26	nexus 5	87
2014-26	nexus 7	46
2014-26	nokia lumia 635	42
2014-26	samsung galaxy tablet	12
2014-26	samsung galaxy note	9
2014-26	samsung galaxy s4	112
2014-26	windows surface	21
2014-27	acer aspire desktop	29
2014-27	acer aspire notebook	49
2014-27	amazon fire phone	10
2014-27	asus chromebook	52
2014-27	dell inspiron desktop	53

2014-27	dell inspiron notebook	89
2014-27	hp pavilion desktop	56
2014-27	htc one	27
2014-27	ipad air	55
2014-27	ipad mini	35
2014-27	iphone 4s	67
2014-27	iphone 5	163
2014-27	iphone 5s	83
2014-27	kindle fire	25
2014-27	lenovo thinkpad	202
2014-27	mac mini	15
2014-27	macbook air	142
2014-27	macbook pro	302
2014-27	nexus 10	37
2014-27	nexus 5	84
2014-27	nexus 7	40
2014-27	nokia lumia 635	31
2014-27	samsung galaxy tablet	15
2014-27	samsung galaxy note	15
2014-27	samsung galaxy s4	116
2014-27	windows surface	33
2014-28	acer aspire desktop	30
2014-28	acer aspire notebook	49
2014-28	amazon fire phone	6
2014-28	asus chromebook	50
2014-28	dell inspiron desktop	56
2014-28	dell inspiron notebook	103
2014-28	hp pavilion desktop	56
2014-28	htc one	26
2014-28	ipad air	54
2014-28	ipad mini	35
2014-28	iphone 4s	61
2014-28	iphone 5	151
2014-28	iphone 5s	93
2014-28	kindle fire	31
2014-28	lenovo thinkpad	220
2014-28	mac mini	28
2014-28	macbook air	148
2014-28	macbook pro	295
2014-28	nexus 10	26
2014-28	nexus 5	85

2014-28	nexus 7	39
2014-28	nokia lumia 635	35
2014-28	samsung galaxy tablet	9
2014-28	samsung galaxy note	10
2014-28	samsung galaxy s4	122
2014-28	windows surface	33
2014-29	acer aspire desktop	28
2014-29	acer aspire notebook	53
2014-29	amazon fire phone	12
2014-29	asus chromebook	49
2014-29	dell inspiron desktop	54
2014-29	dell inspiron notebook	113
2014-29	hp pavilion desktop	58
2014-29	htc one	31
2014-29	ipad air	52
2014-29	ipad mini	34
2014-29	iphone 4s	60
2014-29	iphone 5	144
2014-29	iphone 5s	90
2014-29	kindle fire	37
2014-29	lenovo thinkpad	209
2014-29	mac mini	31
2014-29	macbook air	148
2014-29	macbook pro	295
2014-29	nexus 10	25
2014-29	nexus 5	77
2014-29	nexus 7	45
2014-29	nokia lumia 635	43
2014-29	samsung galaxy tablet	13
2014-29	samsung galaxy note	16
2014-29	samsung galaxy s4	123
2014-29	windows surface	28
2014-30	acer aspire desktop	33
2014-30	acer aspire notebook	60
2014-30	amazon fire phone	12
2014-30	asus chromebook	56
2014-30	dell inspiron desktop	54
2014-30	dell inspiron notebook	127
2014-30	hp pavilion desktop	42
2014-30	htc one	31
2014-30	ipad air	70

2014-30	ipad mini	35
2014-30	iphone 4s	65
2014-30	iphone 5	152
2014-30	iphone 5s	103
2014-30	kindle fire	25
2014-30	lenovo thinkpad	206
2014-30	mac mini	23
2014-30	macbook air	159
2014-30	macbook pro	322
2014-30	nexus 10	36
2014-30	nexus 5	84
2014-30	nexus 7	62
2014-30	nokia lumia 635	34
2014-30	samsung galaxy tablet	9
2014-30	samsung galaxy note	15
2014-30	samsung galaxy s4	103
2014-30	windows surface	19
2014-31	acer aspire desktop	31
2014-31	acer aspire notebook	55
2014-31	amazon fire phone	14
2014-31	asus chromebook	56
2014-31	dell inspiron desktop	44
2014-31	dell inspiron notebook	113
2014-31	hp pavilion desktop	51
2014-31	htc one	13
2014-31	ipad air	55
2014-31	ipad mini	27
2014-31	iphone 4s	56
2014-31	iphone 5	135
2014-31	iphone 5s	71
2014-31	kindle fire	14
2014-31	lenovo thinkpad	207
2014-31	mac mini	24
2014-31	macbook air	147
2014-31	macbook pro	321
2014-31	nexus 10	24
2014-31	nexus 5	69
2014-31	nexus 7	38
2014-31	nokia lumia 635	28
2014-31	samsung galaxy tablet	8
2014-31	samsung galaxy note	14

2014-31	samsung galaxy s4	100
2014-31	windows surface	19
2014-32	acer aspire desktop	35
2014-32	acer aspire notebook	55
2014-32	amazon fire phone	12
2014-32	asus chromebook	62
2014-32	dell inspiron desktop	57
2014-32	dell inspiron notebook	104
2014-32	hp pavilion desktop	51
2014-32	htc one	18
2014-32	ipad air	48
2014-32	ipad mini	30
2014-32	iphone 4s	34
2014-32	iphone 5	119
2014-32	iphone 5s	67
2014-32	kindle fire	12
2014-32	lenovo thinkpad	179
2014-32	mac mini	20
2014-32	macbook air	125
2014-32	macbook pro	307
2014-32	nexus 10	30
2014-32	nexus 5	67
2014-32	nexus 7	25
2014-32	nokia lumia 635	28
2014-32	samsung galaxy tablet	6
2014-32	samsung galaxy note	12
2014-32	samsung galaxy s4	82
2014-32	windows surface	10
2014-33	acer aspire desktop	39
2014-33	acer aspire notebook	46
2014-33	amazon fire phone	14
2014-33	asus chromebook	49
2014-33	dell inspiron desktop	37
2014-33	dell inspiron notebook	110
2014-33	hp pavilion desktop	38
2014-33	htc one	19
2014-33	ipad air	40
2014-33	ipad mini	28
2014-33	iphone 4s	35
2014-33	iphone 5	110
2014-33	iphone 5s	65

2014-33	kindle fire	14
2014-33	lenovo thinkpad	191
2014-33	mac mini	32
2014-33	macbook air	133
2014-33	macbook pro	312
2014-33	nexus 10	23
2014-33	nexus 5	70
2014-33	nexus 7	30
2014-33	nokia lumia 635	27
2014-33	samsung galaxy tablet	12
2014-33	samsung galaxy note	13
2014-33	samsung galaxy s4	80
2014-33	windows surface	15
2014-34	acer aspire desktop	30
2014-34	acer aspire notebook	63
2014-34	amazon fire phone	11
2014-34	asus chromebook	47
2014-34	dell inspiron desktop	49
2014-34	dell inspiron notebook	105
2014-34	hp pavilion desktop	36
2014-34	htc one	25
2014-34	ipad air	39
2014-34	ipad mini	25
2014-34	iphone 4s	50
2014-34	iphone 5	101
2014-34	iphone 5s	70
2014-34	kindle fire	13
2014-34	lenovo thinkpad	193
2014-34	mac mini	30
2014-34	macbook air	136
2014-34	macbook pro	292
2014-34	nexus 10	25
2014-34	nexus 5	70
2014-34	nexus 7	33
2014-34	nokia lumia 635	17
2014-34	samsung galaxy tablet	14
2014-34	samsung galaxy note	13
2014-34	samsung galaxy s4	90
2014-34	windows surface	18
2014-35	acer aspire desktop	1
2014-35	acer aspire notebook	3

2014-35	asus chromebook	6
2014-35	dell inspiron desktop	1
2014-35	dell inspiron notebook	9
2014-35	hp pavilion desktop	1
2014-35	htc one	2
2014-35	ipad mini	2
2014-35	iphone 4s	6
2014-35	iphone 5	2
2014-35	iphone 5s	3
2014-35	kindle fire	3
2014-35	lenovo thinkpad	16
2014-35	mac mini	2
2014-35	macbook air	10
2014-35	macbook pro	17
2014-35	nexus 10	2
2014-35	nexus 5	4
2014-35	nexus 7	2
2014-35	nokia lumia 635	2
2014-35	samsung galaxy note	1
2014-35	samsung galaxy s4	6
2014-35	windows surface	3

E. OBJECTIVE: Email Engagement analysis:

Analyse how users are engaging with the email service.

SQL Query:

```

SELECT
100 * SUM(CASE
    WHEN email_cat = 'email_open' THEN 1
    ELSE 0
END) / SUM(CASE
    WHEN email_cat = 'email_sent' THEN 1
    ELSE 0
END) AS email_open_rate,
100 * SUM(CASE

```

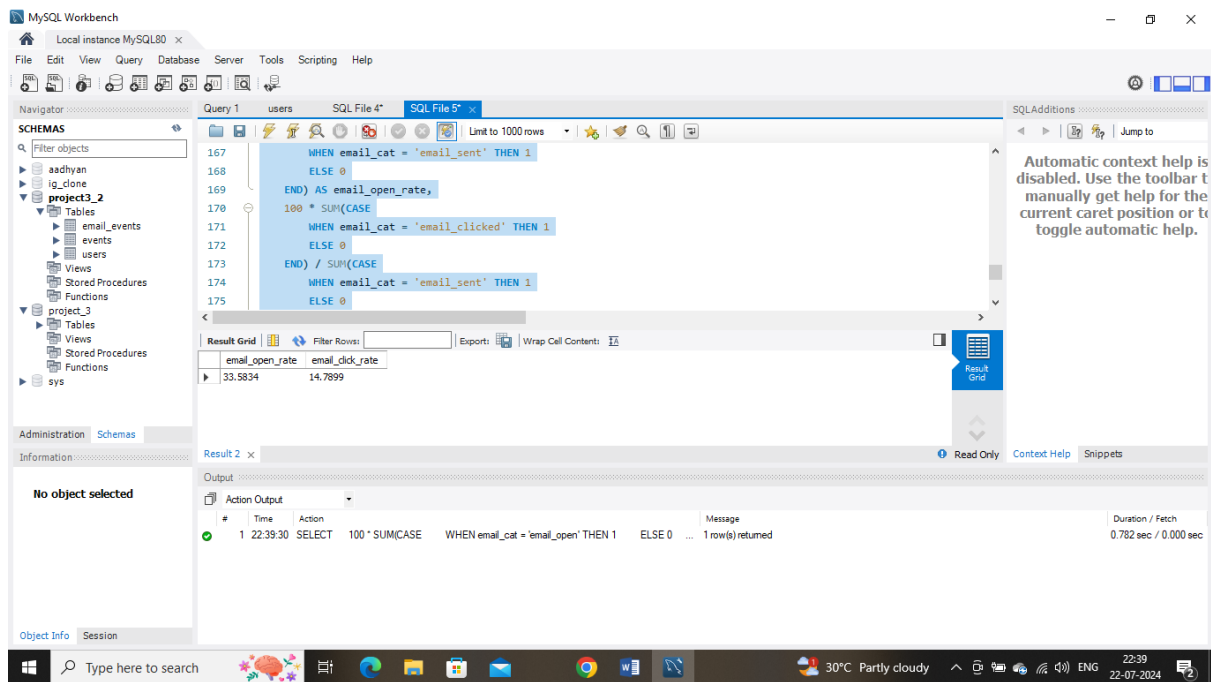
```

        WHEN email_cat = 'email_clicked' THEN 1
        ELSE 0
    END) / SUM(CASE
        WHEN email_cat = 'email_sent' THEN 1
        ELSE 0
    END) AS email_click_rate
FROM
    (SELECT
        *,
        CASE
            WHEN action IN ('sent_weekly_digest' , 'sent_reengagement_email')
THEN 'email_sent'
            WHEN action = 'email_open' THEN 'email_open'
            WHEN action = 'email_clickthrough' THEN 'email_clicked'
        END AS email_cat
    FROM
        email_events) sub
LIMIT 0 , 1000;

```

Output:

email_open_rate,	email_click_rate
'33.5834',	'14.7899'



CONCLUSION:

The project's key results included :

Jobs reviewed per hour per day, throughput analysis, percentage share of language, duplicate row detection, User growth, engagement and retention rates.

By using MySql, it was easy for me to run queries and fetch insights.

This project included advanced SQL queries which was challenging for me and helped me in brushing up my skills.