

OPERATIONAL ANALYTICS AND INVESTIGATING METRIC SPIKE

PROJECT DESCRIPTION:

This project is related to operational analytics which helps 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, we will come across such tasks regularly. It's about understanding user behaviour over time, spotting trends, and making data-driven decisions to enhance the overall user experience.

The methodology involves employing SQL queries on a MySQL Workbench database. Each query is carefully designed to extract specific information relevant to the management's inquiries. The focus is on crafting clean, optimized queries to ensure efficiency in data retrieval.

APPROACH:

In executing the project, a meticulous and systematic approach was adopted, ensuring clarity in understanding each query posed by the management. The process involved the following key steps:

1. Formulation of Entity Relationship Diagram
2. Step by step breakdown of the problem
3. Formulation of query step by step

Key Benefits of the Approach:

1. Clarity in Understanding
2. Precise Query Interpretation
3. Optimized Data Retrieval
4. Insightful Analysis
5. Alignment with Objectives

TECH STACK USED:

MySQL Workbench was used to carry out the operations. It is an open-source RDBMS.

INSIGHTS:

Case Study 1

Jobs Reviewed Over Time:

This could indicate peak hiring seasons, or cyclical patterns in job availability. Are there periods of high or low activity?

Throughput Analysis:

How quickly are jobs being reviewed and processed? A high throughput suggests a streamlined and efficient workflow, while low throughput may indicate bottlenecks or resource constraints.

It is better to take 7 days rolling average than the daily metric as throughput can vary significantly from day to day due to various factors like workload peaks, project deadlines, or external influences. A 7-day average helps smooth out these daily fluctuations, providing a more stable and representative measure of overall throughput.

Language Share Analysis:

The analysis provides insights into the linguistic preferences or requirements within the job market. This can be crucial for individuals seeking employment in a particular location or industry where knowledge of a specific language is essential.

Duplicate Rows Detection:

Identifying duplicate rows in a dataset is essential for maintaining data integrity and ensuring accurate analyses.

Case Study 2

Weekly User Engagement:

Identify peak engagement times during the week. This can help optimize content delivery or product updates to coincide with periods of high user activity. Detection of any shifts or trends in user behaviour on a weekly basis.

User Growth Analysis:

Understand the pace at which new users are joining. This insight is crucial for assessing the effectiveness of marketing strategies or user acquisition efforts.

Weekly Retention Analysis:

To evaluate how well your platform retains users from week to week. High retention rates indicate user satisfaction and engagement. Identification of weeks where there is a significant drop in user engagement could signal potential issues or dissatisfaction that needs to be addressed.

Weekly Engagement Per Device:

Understanding of devices (desktop, mobile, tablet) which users prefer during different days of the week. This can guide the optimization of the user interface for specific devices on certain days.

Email Engagement Analysis:

Open and click rates can indicate the weekly performance of email campaigns. It can also help in identification of the types of emails which resonate most with users on specific days.

RESULTS:

CASE STUDY 1

#Jobs reviewed per hour for each day in November, 2020

```
SELECT
    ds,
    ROUND((COUNT(job_id) / SUM(time_spent)) * 60 * 60,
          2) AS TOTAL_TIME_EACH_DAY
FROM
    job_data
GROUP BY ds
ORDER BY ds
;
```

Result Set

ds	TOTAL_TIME_EACH_DAY
01/11/20	61.28
04/11/20	51.8
05/11/20	57.14
06/11/20	48.65
09/11/20	63.53
10/11/20	42.86
12/11/20	90
16/11/20	87.8
17/11/20	48.32
18/11/20	65.45
19/11/20	61.54
20/11/20	55.38
21/11/20	50.35
23/11/20	34.29
24/11/20	38.92
25/11/20	46.45
26/11/20	58.38
27/11/20	35.29
28/11/20	218.18
29/11/20	166.15
30/11/20	92.31

#THROUGHPUT ANALYSIS

#7-day rolling average of throughput (number of events per second)

WITH AVG_EVENTS AS

(SELECT ds, COUNT(`event`)/SUM(time_spent) AS

per_sec_event

FROM job_data

GROUP BY ds)

SELECT ds, ROUND(AVG(per_sec_event)OVER(ROWS BETWEEN 6 preceding AND
current ROW),2)

AS Rolling_AVG_7_days

FROM AVG_EVENTS;

Result set

ds	Rolling_AVG_7_days
30/11/20	0.03
29/11/20	0.04
28/11/20	0.04
27/11/20	0.04
26/11/20	0.03
25/11/20	0.03
24/11/20	0.02
23/11/20	0.02
21/11/20	0.02
20/11/20	0.02
19/11/20	0.01
18/11/20	0.02
17/11/20	0.02
16/11/20	0.02
12/11/20	0.02
10/11/20	0.02
09/11/20	0.03
06/11/20	0.02
05/11/20	0.02
04/11/20	0.02
01/11/20	0.03

#Language Share Analysis

```
WITH t AS(  
    SELECT COUNT(*) AS Total_records  
    FROM job_data)  
SELECT language, ROUND((COUNT(language)*100)/ Total_records, 2)  
AS Language_Share  
FROM t, job_data  
GROUP by Language, total_records;
```

Result Set

language	Language_Share
Arabic	15.69
English	15.69
French	13.73
Hindi	13.73
Italian	11.76
Persian	29.41

```
SELECT  
    language,  
    ROUND((COUNT(language) * 100) / (SELECT  
        COUNT(*)  
        FROM  
            job_data),  
    2) AS Langauge_share  
FROM  
    job_data  
GROUP BY language;
```

Result Set

language	Language_Share
English	15.69
Arabic	15.69
Persian	29.41
Hindi	13.73
French	13.73
Italian	11.76

#Duplicate Rows Detection

```
SELECT
    ds,
    job_id,
    actor_id,
    `event`,
    `language`,
    time_spent,
    org,
    COUNT(1)
FROM
    job_data
GROUP BY ds , job_id , actor_id , `event` , `language` , time_spent , org
HAVING COUNT(1) > 1;
```

Result Set

ds	job_id	actor_id	event	language	time_spent	org	COUNT(1)
21/11/20	31	1020	transfer	English	79	C	2
17/11/20	22	1055	decision	Arabic	77	C	2

CASE STUDY 2

#Weekly User Engagement

```
SELECT
    COUNT(user_id) AS 'User Engagement',
    EXTRACT(WEEK FROM occurred_at) AS WEEK
FROM
    events
WHERE
    event_type = 'engagement'
GROUP BY WEEK
ORDER BY WEEK;
```

Result Set

User Engagement	WEEK
8019	17
17341	18
17224	19
17911	20
17151	21
18413	22
18280	23
19052	24
18642	25
19061	26
19881	27
20776	28
20067	29
21533	30
18556	31
16612	32
16145	33
16127	34
784	35

```

SELECT
    user_id,
    COUNT(user_id) `User Engagement`,
    EXTRACT(WEEK FROM occurred_at) AS WEEK
FROM
    events
WHERE
    event_type = 'engagement'
GROUP BY WEEK , user_id
ORDER BY WEEK;

```

Result Set

user_id	User Engagement	WEEK
8	2	17
22	8	17
66	14	17
163	22	17
172	15	17
209	9	17
232	39	17
239	9	17
253	18	17
287	16	17
319	10	17
365	7	17
373	8	17
404	3	17
434	5	17
441	28	17
492	19	17
589	11	17
591	13	17
660	5	17
688	8	17
714	7	17
729	50	17
745	25	17
746	5	17
822	4	17
836	3	17
857	47	17
864	3	17

914	45	17
915	13	17
916	5	17
973	12	17
984	3	17
1012	10	17
1114	17	17
1128	7	17
1147	18	17
1154	17	17
1165	7	17
1260	3	17
1287	7	17
1295	8	17
1297	25	17
1346	4	17
1367	20	17
1381	17	17
1384	6	17
1412	70	17
1428	13	17
1439	27	17
1509	22	17
1554	15	17
1570	12	17
1591	6	17
1605	21	17
1611	30	17
1619	27	17
1635	31	17
1650	12	17
1695	6	17
1737	40	17
1761	7	17
1811	17	17
1895	21	17
1927	24	17
1979	10	17
1997	3	17
2026	14	17
2070	7	17
2079	57	17

2111	16	17
2123	36	17
2125	29	17
2138	13	17
2172	11	17
2176	10	17
2250	16	17
2265	5	17
2279	26	17
2329	7	17
2360	10	17
2372	5	17
2373	3	17
2376	15	17
2451	15	17
2513	35	17
2528	46	17
2661	11	17
2706	3	17
2707	10	17
2761	9	17
2787	3	17
2799	2	17
2814	10	17
2843	28	17
2844	34	17
2853	10	17
2872	6	17
2931	7	17
2935	5	17
2940	7	17
2959	24	17
2968	7	17
2990	6	17
3025	31	17
3039	10	17
3051	9	17
3065	3	17
3081	9	17
3100	30	17
3102	5	17
3103	18	17

3146	5	17
3163	17	17
3176	17	17
3194	7	17
3200	7	17
3243	3	17
3245	19	17
3255	40	17
3275	9	17
3281	7	17
3289	8	17
3320	6	17
3325	47	17
3349	47	17
3353	8	17
3420	6	17
3446	25	17
3451	11	17
3464	7	17
3484	6	17
3495	15	17
3584	34	17
3590	30	17
3599	5	17
3633	58	17
3636	3	17
3658	8	17
3660	4	17
3760	4	17
3830	23	17
3848	7	17
3856	7	17
3882	8	17
3937	13	17
3975	8	17
3979	2	17
4052	2	17
4088	7	17
4099	5	17
4119	10	17
4140	19	17
4202	9	17

4248	8	17
4273	2	17
4281	17	17
4296	5	17
4306	11	17
4347	17	17
4353	6	17
4414	16	17
4442	2	17
4526	18	17
4535	5	17
4545	26	17
4561	7	17
4569	3	17
4584	7	17
4626	56	17
4686	29	17
4697	2	17
4805	4	17
4808	15	17
4824	10	17
4844	7	17
4934	17	17
4972	11	17
4976	6	17
4977	5	17
4988	4	17
5010	27	17
5110	21	17
5134	9	17
5156	61	17
5164	43	17
5168	9	17
5192	11	17
5217	30	17
5244	11	17
5275	12	17
5294	31	17
5299	30	17
5326	42	17
5373	6	17
5388	8	17

5394	13	17
5403	6	17
5424	21	17
5562	2	17
5563	2	17
5569	97	17
5574	8	17
5642	9	17
5677	12	17
5720	10	17
5813	23	17
5830	19	17
5888	16	17
5952	10	17
5954	7	17
5961	15	17
5981	11	17
6181	22	17
6215	6	17
6337	6	17
6349	30	17
6372	7	17
6410	12	17
6426	6	17
6435	28	17
6540	6	17
6602	15	17
6616	3	17
6625	8	17
6634	5	17
6637	3	17
6681	6	17
6739	19	17
6947	6	17
6969	13	17
7050	2	17
7110	26	17
7111	5	17
7131	11	17
7272	11	17
7300	3	17
7330	2	17

7370	9	17
7486	2	17
7492	8	17
7524	3	17
7531	31	17
7595	11	17
7603	19	17
7605	26	17
7632	11	17
7634	10	17
7655	5	17
7723	3	17
7829	4	17
7942	16	17
7946	4	17
8010	3	17
8016	7	17
8039	2	17
8041	5	17
8043	3	17
8044	12	17
8065	18	17
8091	2	17
8123	31	17
8134	13	17
8175	9	17
8183	7	17
8232	7	17
8236	2	17
8238	6	17
8253	12	17
8269	6	17
8280	5	17
8295	12	17
8305	17	17
8313	6	17
8317	7	17
8321	13	17
8342	11	17
8382	6	17
8405	12	17
8449	8	17

8454	45	17
8478	50	17
8486	6	17
8487	23	17
8532	15	17
8548	5	17
8583	12	17
8631	8	17
8644	3	17
8650	4	17
8744	17	17
8779	16	17
8787	2	17
8789	16	17
8807	10	17
8808	7	17
8829	7	17
8834	6	17
8869	6	17
8906	14	17
8938	19	17
8939	5	17
8981	13	17
9024	17	17
9025	7	17
9051	8	17
9065	9	17
9073	11	17
9136	25	17
9188	8	17
9241	21	17
9284	8	17
9287	11	17
9290	3	17
9318	41	17
9330	5	17
9350	5	17
9353	13	17
9421	2	17
9433	14	17
9468	6	17
9479	4	17

9516	2	17
9527	3	17
9567	4	17
9577	20	17
9588	31	17
9631	22	17
9640	21	17
9676	9	17
9799	34	17
9861	17	17
9874	4	17
9876	9	17
9882	15	17
9891	21	17
9899	2	17
9921	5	17
9929	24	17
9946	12	17
9954	8	17
9981	18	17
9988	6	17
9992	24	17
9997	7	17
10033	12	17
10075	3	17
10097	5	17
10099	7	17
10115	12	17
10155	8	17
10158	7	17
10166	9	17
10192	2	17
10196	9	17
10200	10	17
10223	11	17
10246	19	17
10247	8	17
10253	12	17
10254	6	17
10277	2	17
10288	9	17
10306	14	17

10309	13	17
10311	8	17
10337	4	17
10339	16	17
10343	6	17
10345	11	17
10353	23	17
10362	13	17
10383	24	17
10434	12	17
10445	5	17
10449	10	17
10457	9	17
10458	4	17
10464	12	17
10481	2	17
10493	13	17
10494	4	17
10498	17	17
10501	10	17
10504	5	17
10507	16	17
10513	4	17
10522	6	17
10523	11	17
10528	6	17
10532	9	17
10555	10	17
10562	3	17
10563	37	17
10572	2	17
10573	6	17
10576	24	17
10595	27	17
10605	23	17
10607	26	17
10612	12	17
10628	26	17
10636	35	17
10644	15	17
10650	4	17
10672	17	17

10675	7	17
10678	9	17
10683	7	17
10685	7	17
10690	56	17
10705	8	17
10712	11	17
10719	5	17
10722	9	17
10735	14	17
10788	17	17
10800	13	17
10839	8	17
10868	16	17
10883	7	17
10897	23	17
10906	2	17
10918	2	17
10924	11	17
10927	18	17
10934	3	17
10939	14	17
10947	18	17
10959	16	17
10967	19	17
10975	7	17
10982	7	17
10992	10	17
10997	19	17
11010	6	17
11020	5	17
11037	25	17
11059	8	17
11061	12	17
11066	21	17
11069	25	17
11070	5	17
11071	2	17
11073	2	17
11077	7	17
11088	3	17
11093	13	17

11095	38	17
11100	4	17
11105	2	17
11110	23	17
11114	13	17
11118	20	17
11122	12	17
11126	43	17
11127	3	17
11132	2	17
11135	9	17
11147	9	17
11152	5	17
11155	16	17
11157	2	17
11161	2	17
11163	4	17
11167	2	17
11170	7	17
11176	25	17
11181	3	17
11184	8	17
11193	10	17
11212	8	17
11213	12	17
11215	2	17
11220	6	17
11227	28	17
11233	7	17
11239	32	17
11240	12	17
11246	4	17
11261	6	17
11264	9	17
11265	4	17
11269	6	17
11270	25	17
11272	3	17
11275	6	17
11276	13	17
11279	17	17
11280	3	17

11282	46	17
11284	8	17
11285	8	17
11292	7	17
11310	3	17
11311	7	17
11314	11	17
11329	14	17
11341	6	17
11343	7	17
11352	13	17
11358	13	17
11364	15	17
11376	2	17
11386	11	17
11392	11	17
11395	12	17
11401	18	17
11406	30	17
11407	8	17
11414	7	17
11417	3	17
11421	40	17
11425	8	17
11426	6	17
11427	20	17
11442	18	17
11455	2	17
11464	4	17
11482	16	17
11484	3	17
11497	7	17
11523	3	17
11527	15	17
11530	5	17
11555	30	17
11563	6	17
11571	4	17
11573	12	17
11578	7	17
11583	8	17
11591	2	17

11592	5	17
11594	2	17
11597	10	17
11599	23	17
11600	3	17
11601	5	17
11602	7	17
11603	4	17
11606	19	17
11607	9	17
11608	4	17
11609	5	17
11610	22	17
11611	22	17
11612	23	17
11614	21	17
11615	2	17
11616	14	17
11617	23	17
11621	10	17
11622	21	17
11624	2	17
11625	14	17
11626	16	17
11632	4	17
11633	5	17
11636	2	17
11640	3	17
11641	8	17
11642	2	17
11643	13	17
11644	3	17
11647	5	17
11651	2	17
11655	28	17
11656	34	17
11657	16	17
11659	4	17
11660	13	17
11661	2	17
11665	10	17
11666	8	17

11670	13	17
11673	6	17
11675	2	17
11676	4	17
11678	7	17
11680	11	17
11684	6	17
11687	12	17
11689	4	17
11695	11	17
11698	3	17
11699	3	17
11701	5	17
11702	6	17
11750	11	17
11756	8	17
11768	6	17
11770	2	17
11775	8	17
11778	13	17
11779	5	17
11780	4	17
11785	10	17
11787	9	17
11791	8	17
11793	9	17
11795	5	17
11798	5	17
11799	8	17
11801	11	17
11804	3	17
11806	8	17
11809	6	17
11811	8	17
11813	2	17
11816	6	17
11818	3	17
11820	5	17
11823	9	17
11824	10	17
11825	5	17
11826	2	17

11828	11	17
11829	3	17
11832	10	17
11833	15	17
11834	2	17
11838	3	17
11839	16	17
11840	2	17
11841	17	17
11842	9	17
11843	8	17
11844	6	17
11849	13	17
11850	5	17
11852	3	17
11854	2	17
11858	12	17
11859	11	17
11863	2	17
11864	2	17
11865	6	17
11868	15	17
11872	5	17
11874	5	17
11875	7	17
11876	7	17
11877	6	17
11879	9	17
11881	10	17
11882	10	17
11884	28	17
11887	4	17
11888	2	17
11889	4	17
11893	4	17
11894	14	17
11895	6	17
11896	9	17
11898	3	17
11899	12	17
11900	7	17
11901	6	17

11906	8	17
11908	3	17
11909	13	17
11914	6	17
8	15	18
20	18	18
22	95	18
66	29	18
101	49	18
136	42	18
163	9	18
171	2	18
172	7	18
209	7	18
227	19	18
232	26	18
239	10	18
247	37	18
253	50	18
287	37	18
319	25	18
332	4	18
365	28	18
366	24	18
381	22	18
388	19	18
402	16	18
434	13	18
437	8	18
462	32	18
479	13	18
492	5	18
498	4	18
501	13	18
521	24	18
529	29	18
535	3	18
546	7	18
551	8	18
555	6	18
576	27	18
589	20	18

591	14	18
643	20	18
688	33	18
698	13	18
714	6	18
729	10	18
745	75	18
746	9	18
761	39	18
780	5	18
825	32	18
836	8	18
857	9	18
864	15	18
914	37	18
916	33	18
959	2	18
960	8	18
984	5	18
1012	30	18
1047	24	18
1055	2	18
1114	22	18
1128	3	18
1147	19	18
1154	31	18
1165	8	18
1220	10	18
1260	3	18
1283	42	18
1287	9	18
1295	8	18
1311	75	18
1319	18	18
1346	10	18
1381	4	18
1384	26	18
1386	5	18
1388	14	18
1412	4	18
1415	10	18
1428	34	18

1445	15	18
1465	10	18
1495	6	18
1496	10	18
1509	14	18
1535	23	18
1549	4	18
1554	26	18
1570	60	18
1577	6	18
1591	17	18
1605	16	18
1619	23	18
1635	4	18
1650	7	18
1669	71	18
1676	5	18
1695	26	18
1710	21	18
1737	47	18
1742	5	18
1761	8	18
1811	9	18
1834	23	18
1861	2	18
1895	17	18
1905	4	18
1927	51	18
1957	16	18
1971	9	18
1979	32	18
1997	2	18
2068	13	18
2070	42	18
2076	6	18
2079	20	18
2123	11	18
2183	47	18
2192	10	18
2223	27	18
2250	7	18
2279	27	18

2313	3	18
2319	12	18
2329	66	18
2360	9	18
2373	8	18
2398	30	18
2410	10	18
2419	5	18
2448	10	18
2451	8	18
2458	35	18
2513	16	18
2528	8	18
2594	16	18
2604	4	18
2607	12	18
2610	2	18
2619	20	18
2661	14	18
2676	18	18
2693	2	18
2706	3	18
2707	16	18
2737	14	18
2744	51	18
2774	3	18
2787	2	18
2799	15	18
2802	16	18
2828	11	18
2843	11	18
2853	17	18
2872	6	18
2876	9	18
2878	60	18
2931	8	18
2935	22	18
2940	52	18
2954	6	18
2959	36	18
2960	23	18
2968	20	18

2990	35	18
3039	14	18
3065	10	18
3081	80	18
3100	48	18
3102	47	18
3103	7	18
3107	24	18
3140	5	18
3142	48	18
3163	32	18
3164	35	18
3170	11	18
3200	2	18
3213	15	18
3215	17	18
3245	17	18
3255	37	18
3271	11	18
3275	19	18
3281	35	18
3289	19	18
3301	7	18
3318	2	18
3320	7	18
3325	8	18
3334	16	18
3349	77	18
3353	9	18
3369	3	18
3390	22	18
3391	24	18
3398	5	18
3420	7	18
3423	2	18
3433	4	18
3446	7	18
3451	31	18
3454	6	18
3464	5	18
3484	14	18
3519	28	18

3575	24	18
3580	8	18
3584	48	18
3590	7	18
3627	11	18
3633	52	18
3658	14	18
3660	22	18
3755	40	18
3760	80	18
3811	5	18
3830	7	18
3835	8	18
3847	11	18
3848	26	18
3873	5	18
3882	32	18
3901	18	18
3909	6	18
3921	4	18
3948	13	18
4030	2	18
4060	32	18
4099	27	18
4115	4	18
4119	9	18
4140	9	18
4163	5	18
4175	68	18
4202	26	18
4204	21	18
4226	13	18
4248	7	18
4256	14	18
4281	26	18
4282	7	18
4291	6	18
4306	12	18
4322	24	18
4329	2	18
4347	16	18
4353	10	18

4380	17	18
4414	2	18
4433	6	18
4442	8	18
4526	8	18
4535	13	18
4545	78	18
4567	21	18
4569	3	18
4575	8	18
4626	61	18
4641	12	18
4686	8	18
4697	2	18
4711	26	18
4717	2	18
4733	12	18
4805	2	18
4808	27	18
4824	8	18
4844	6	18
4852	18	18
4866	52	18
4876	40	18
4899	27	18
4935	4	18
4957	19	18
4963	15	18
4972	18	18
4977	18	18
5010	30	18
5018	22	18
5069	12	18
5083	9	18
5110	15	18
5134	36	18
5156	24	18
5164	39	18
5168	17	18
5191	17	18
5192	14	18
5217	5	18

5244	18	18
5249	11	18
5262	4	18
5275	5	18
5292	6	18
5294	13	18
5326	25	18
5342	10	18
5356	6	18
5366	50	18
5373	6	18
5388	21	18
5394	30	18
5403	4	18
5422	16	18
5424	22	18
5440	35	18
5457	9	18
5501	7	18
5508	22	18
5519	6	18
5526	4	18
5530	13	18
5548	8	18
5563	3	18
5564	4	18
5569	36	18
5629	14	18
5632	2	18
5633	27	18
5664	23	18
5677	20	18
5706	4	18
5754	69	18
5796	6	18
5813	33	18
5888	35	18
5957	36	18
5981	20	18
6023	6	18
6050	6	18
6081	8	18

6102	16	18
6116	7	18
6152	4	18
6172	3	18
6212	4	18

#USER GROWTH ANALYSIS

```

WITH New_Users AS(SELECT COUNT(user_id) Total_New_Users , EXTRACT(MONTH
FROM occurred_at) AS Month
FROM events
WHERE event_type= "signup_flow"
GROUP BY MONTH),
Running_Total AS( SELECT SUM(Total_New_Users) OVER(ORDER BY MONTH) AS
Running_Total, Month
FROM New_Users)
SELECT New_Users.Month, Total_New_Users,Running_Total,
ROUND((Total_New_Users/Running_Total)*100,2) AS `User Growth in %`
FROM New_Users, Running_Total
WHERE New_Users.Month= Running_Total.Month;

```

Result Set

Month	Total_New_Users	Running_Total	User Growth in %
5	779	779	100
6	873	1652	52.85
7	997	2649	37.64
8	1031	3680	28.02

#WEEKLY RETENTION ANALYSIS

```

WITH a AS(SELECT user_id, EXTRACT(WEEK FROM occurred_at) AS week_signup,
COUNT(user_id)OVER(PARTITION BY EXTRACT(WEEK FROM occurred_at))
count_signup
FROM events
WHERE event_type= "signup_flow")
SELECT week_signup, count_signup, EXTRACT(WEEK FROM occurred_at)
week_engagement,
COUNT(DISTINCT events.user_id) AS Retention, ROUND((COUNT(DISTINCT
events.user_id)/ count_signup)*100,2) AS Retention_perc
FROM a, events
WHERE a.user_id= events.user_id
AND events.event_type = "engagement"

```


GROUP BY week_signup, count_signup, week_engagement
ORDER BY week_signup, week_engagement;

Result Set

week_signup	count_signup	week_engagement	Retention	Retention_perc
17	72	17	72	100
17	72	18	59	81.94
17	72	19	24	33.33
17	72	20	16	22.22
17	72	21	11	15.28
17	72	22	16	22.22
17	72	23	11	15.28
17	72	24	9	12.5
17	72	25	6	8.33
17	72	26	8	11.11
17	72	27	8	11.11
17	72	28	8	11.11
17	72	29	7	9.72
17	72	30	9	12.5
17	72	31	6	8.33
17	72	32	5	6.94
17	72	33	1	1.39
17	72	34	2	2.78
18	163	18	163	100
18	163	19	114	69.94
18	163	20	73	44.79
18	163	21	49	30.06
18	163	22	37	22.7
18	163	23	26	15.95
18	163	24	19	11.66
18	163	25	25	15.34
18	163	26	13	7.98
18	163	27	18	11.04
18	163	28	13	7.98
18	163	29	13	7.98
18	163	30	15	9.2
18	163	31	11	6.75
18	163	32	9	5.52
18	163	33	11	6.75
18	163	34	5	3.07
18	163	35	1	0.61
19	185	19	185	100

19	185	20	142	76.76
19	185	21	73	39.46
19	185	22	59	31.89
19	185	23	40	21.62
19	185	24	25	13.51
19	185	25	22	11.89
19	185	26	19	10.27
19	185	27	23	12.43
19	185	28	18	9.73
19	185	29	15	8.11
19	185	30	15	8.11
19	185	31	13	7.03
19	185	32	11	5.95
19	185	33	8	4.32
19	185	34	9	4.86
20	176	20	176	100
20	176	21	128	72.73
20	176	22	86	48.86
20	176	23	52	29.55
20	176	24	39	22.16
20	176	25	29	16.48
20	176	26	22	12.5
20	176	27	32	18.18
20	176	28	22	12.5
20	176	29	21	11.93
20	176	30	23	13.07
20	176	31	16	9.09
20	176	32	17	9.66
20	176	33	9	5.11
20	176	34	10	5.68
21	183	21	183	100
21	183	22	121	66.12
21	183	23	74	40.44
21	183	24	51	27.87
21	183	25	34	18.58
21	183	26	23	12.57
21	183	27	31	16.94
21	183	28	30	16.39
21	183	29	20	10.93
21	183	30	20	10.93
21	183	31	14	7.65
21	183	32	16	8.74

21	183	33	17	9.29
21	183	34	10	5.46
22	196	22	196	100
22	196	23	142	72.45
22	196	24	82	41.84
22	196	25	57	29.08
22	196	26	47	23.98
22	196	27	38	19.39
22	196	28	29	14.8
22	196	29	23	11.73
22	196	30	26	13.27
22	196	31	18	9.18
22	196	32	18	9.18
22	196	33	12	6.12
22	196	34	6	3.06
23	196	23	196	100
23	196	24	146	74.49
23	196	25	85	43.37
23	196	26	57	29.08
23	196	27	51	26.02
23	196	28	43	21.94
23	196	29	35	17.86
23	196	30	27	13.78
23	196	31	22	11.22
23	196	32	20	10.2
23	196	33	14	7.14
23	196	34	11	5.61
24	229	24	229	100
24	229	25	151	65.94
24	229	26	89	38.86
24	229	27	58	25.33
24	229	28	41	17.9
24	229	29	32	13.97
24	229	30	30	13.1
24	229	31	25	10.92
24	229	32	15	6.55
24	229	33	19	8.3
24	229	34	11	4.8
25	207	25	207	100
25	207	26	165	79.71
25	207	27	97	46.86
25	207	28	61	29.47

25	207	29	40	19.32
25	207	30	29	14.01
25	207	31	22	10.63
25	207	32	19	9.18
25	207	33	15	7.25
25	207	34	16	7.73
26	201	26	201	100
26	201	27	138	68.66
26	201	28	84	41.79
26	201	29	60	29.85
26	201	30	45	22.39
26	201	31	35	17.41
26	201	32	32	15.92
26	201	33	25	12.44
26	201	34	16	7.96
27	222	27	222	100
27	222	28	161	72.52
27	222	29	95	42.79
27	222	30	80	36.04
27	222	31	51	22.97
27	222	32	38	17.12
27	222	33	27	12.16
27	222	34	23	10.36
28	215	28	215	100
28	215	29	161	74.88
28	215	30	92	42.79
28	215	31	56	26.05
28	215	32	35	16.28
28	215	33	18	8.37
28	215	34	19	8.84
29	221	29	221	100
29	221	30	160	72.4
29	221	31	81	36.65
29	221	32	53	23.98
29	221	33	39	17.65
29	221	34	33	14.93
29	221	35	1	0.45
30	238	30	238	100
30	238	31	171	71.85
30	238	32	94	39.5
30	238	33	65	27.31
30	238	34	43	18.07

30	238	35	3	1.26
31	193	31	193	100
31	193	32	136	70.47
31	193	33	69	35.75
31	193	34	52	26.94
31	193	35	1	0.52
32	245	32	245	100
32	245	33	174	71.02
32	245	34	81	33.06
32	245	35	8	3.27
33	261	33	261	100
33	261	34	187	71.65
33	261	35	8	3.07
34	259	34	259	100
34	259	35	43	16.6
35	18	35	18	100

#Weekly Engagement Per Device

```

SELECT
  COUNT(user_id) users_count,
  EXTRACT(WEEK FROM occurred_at) `week`,
  device
FROM
  events
GROUP BY Device , week
ORDER BY week;

```

Result Set

users_count	week	device
506	17	dell inspiron notebook
715	17	iphone 5
219	17	iphone 4s
385	17	nexus 5
71	17	samsung galaxy tablet
476	17	iphone 5s
1527	17	macbook pro
454	17	samsung galaxy s4
207	17	acer aspire notebook
493	17	macbook air
801	17	lenovo thinkpad
117	17	samsung galaxy note

60	17	mac mini
134	17	hp pavilion desktop
181	17	nexus 7
254	17	asus chromebook
331	17	ipad air
192	17	htc one
188	17	dell inspiron desktop
208	17	ipad mini
84	17	amazon fire phone
69	17	acer aspire desktop
130	17	nokia lumia 635
145	17	nexus 10
57	17	kindle fire
87	17	windows surface
451	18	iphone 4s
1617	18	macbook air
3334	18	macbook pro
269	18	kindle fire
313	18	ipad mini
255	18	nexus 7
1140	18	samsung galaxy s4
1752	18	lenovo thinkpad
1333	18	iphone 5
963	18	dell inspiron notebook
526	18	asus chromebook
945	18	nexus 5
366	18	acer aspire notebook
345	18	nokia lumia 635
786	18	iphone 5s
179	18	amazon fire phone
372	18	nexus 10
143	18	samsung galaxy note
379	18	hp pavilion desktop
160	18	mac mini
528	18	ipad air
176	18	htc one
686	18	dell inspiron desktop
299	18	acer aspire desktop
108	18	windows surface
79	18	samsung galaxy tablet

165	19	windows surface
972	19	iphone 5s
412	19	acer aspire notebook
1199	19	dell inspiron notebook
381	19	ipad mini
270	19	asus chromebook
3189	19	macbook pro
958	19	nexus 5
552	19	iphone 4s
256	19	mac mini
1351	19	macbook air
1036	19	samsung galaxy s4
120	19	samsung galaxy note
275	19	htc one
338	19	nexus 7
604	19	ipad air
2163	19	lenovo thinkpad
445	19	dell inspiron desktop
1208	19	iphone 5
235	19	nexus 10
229	19	kindle fire
381	19	hp pavilion desktop
145	19	amazon fire phone
217	19	nokia lumia 635
242	19	acer aspire desktop
66	19	samsung galaxy tablet
3129	20	macbook pro
983	20	dell inspiron notebook
194	20	windows surface
1009	20	samsung galaxy s4
156	20	nokia lumia 635
1314	20	iphone 5
612	20	iphone 4s
1285	20	nexus 5
486	20	acer aspire notebook
243	20	kindle fire
616	20	ipad air
270	20	ipad mini
2222	20	lenovo thinkpad
375	20	nexus 7

1460	20	macbook air
515	20	dell inspiron desktop
228	20	acer aspire desktop
1037	20	iphone 5s
163	20	samsung galaxy note
274	20	mac mini
467	20	asus chromebook
220	20	nexus 10
278	20	hp pavilion desktop
105	20	amazon fire phone
368	20	htc one
78	20	samsung galaxy tablet
3069	21	macbook pro
64	21	samsung galaxy tablet
529	21	iphone 4s
331	21	acer aspire desktop
1279	21	macbook air
1588	21	iphone 5
965	21	dell inspiron notebook
558	21	asus chromebook
1912	21	lenovo thinkpad
283	21	ipad mini
571	21	dell inspiron desktop
813	21	iphone 5s
263	21	htc one
1035	21	nexus 5
482	21	hp pavilion desktop
435	21	ipad air
213	21	nexus 7
263	21	nexus 10
186	21	windows surface
466	21	acer aspire notebook
969	21	samsung galaxy s4
200	21	samsung galaxy note
191	21	nokia lumia 635
358	21	kindle fire
282	21	mac mini
29	21	amazon fire phone
1028	22	samsung galaxy s4
3073	22	macbook pro

483	22	iphone 4s
1826	22	lenovo thinkpad
1242	22	nexus 5
1403	22	iphone 5
190	22	windows surface
1740	22	macbook air
932	22	iphone 5s
744	22	dell inspiron desktop
596	22	ipad air
316	22	nexus 10
345	22	ipad mini
311	22	nokia lumia 635
639	22	asus chromebook
1026	22	dell inspiron notebook
439	22	nexus 7
375	22	hp pavilion desktop
48	22	amazon fire phone
437	22	acer aspire notebook
278	22	mac mini
325	22	htc one
234	22	kindle fire
72	22	samsung galaxy tablet
255	22	acer aspire desktop
252	22	samsung galaxy note
3149	23	macbook pro
465	23	iphone 4s
307	23	nexus 7
679	23	asus chromebook
867	23	iphone 5s
1103	23	samsung galaxy s4
1003	23	nexus 5
665	23	hp pavilion desktop
1764	23	iphone 5
1451	23	macbook air
503	23	dell inspiron desktop
1906	23	lenovo thinkpad
263	23	ipad mini
456	23	acer aspire notebook
356	23	kindle fire
101	23	samsung galaxy tablet

1044	23	dell inspiron notebook
235	23	htc one
244	23	acer aspire desktop
172	23	mac mini
537	23	nexus 10
157	23	windows surface
182	23	amazon fire phone
409	23	ipad air
275	23	nokia lumia 635
183	23	samsung galaxy note
478	24	asus chromebook
1742	24	macbook air
215	24	windows surface
725	24	hp pavilion desktop
317	24	ipad mini
3067	24	macbook pro
1091	24	dell inspiron notebook
969	24	iphone 5s
1829	24	lenovo thinkpad
425	24	nexus 7
242	24	kindle fire
1497	24	iphone 5
101	24	samsung galaxy tablet
614	24	iphone 4s
1160	24	nexus 5
719	24	dell inspiron desktop
957	24	samsung galaxy s4
626	24	ipad air
374	24	nexus 10
140	24	htc one
490	24	nokia lumia 635
149	24	amazon fire phone
514	24	acer aspire notebook
300	24	mac mini
294	24	acer aspire desktop
246	24	samsung galaxy note
2966	25	macbook pro
1116	25	samsung galaxy s4
561	25	nexus 7
2118	25	lenovo thinkpad

452	25	nokia lumia 635
654	25	dell inspiron desktop
1283	25	macbook air
438	25	asus chromebook
444	25	iphone 4s
969	25	iphone 5s
1661	25	iphone 5
1229	25	dell inspiron notebook
288	25	htc one
132	25	amazon fire phone
161	25	samsung galaxy tablet
238	25	windows surface
264	25	acer aspire desktop
261	25	nexus 10
612	25	acer aspire notebook
943	25	nexus 5
593	25	hp pavilion desktop
233	25	mac mini
651	25	ipad air
237	25	ipad mini
211	25	kindle fire
134	25	samsung galaxy note
1508	26	macbook air
461	26	nokia lumia 635
2236	26	lenovo thinkpad
263	26	nexus 10
3341	26	macbook pro
1122	26	samsung galaxy s4
434	26	nexus 7
317	26	acer aspire desktop
181	26	windows surface
1624	26	iphone 5
142	26	mac mini
639	26	asus chromebook
98	26	samsung galaxy note
255	26	kindle fire
1085	26	dell inspiron notebook
517	26	hp pavilion desktop
137	26	amazon fire phone
226	26	htc one

584	26	ipad air
1043	26	iphone 5s
679	26	dell inspiron desktop
918	26	nexus 5
334	26	acer aspire notebook
509	26	iphone 4s
468	26	ipad mini
141	26	samsung galaxy tablet
109	27	amazon fire phone
733	27	iphone 4s
3593	27	macbook pro
965	27	iphone 5s
1889	27	iphone 5
594	27	hp pavilion desktop
171	27	mac mini
1668	27	macbook air
324	27	nexus 10
371	27	nexus 7
2255	27	lenovo thinkpad
997	27	dell inspiron notebook
1025	27	nexus 5
1169	27	samsung galaxy s4
546	27	dell inspiron desktop
345	27	ipad mini
516	27	asus chromebook
227	27	htc one
350	27	windows surface
299	27	acer aspire desktop
589	27	acer aspire notebook
327	27	nokia lumia 635
272	27	kindle fire
487	27	ipad air
133	27	samsung galaxy note
149	27	samsung galaxy tablet
1669	28	iphone 5
1197	28	dell inspiron notebook
3496	28	macbook pro
1277	28	samsung galaxy s4
2582	28	lenovo thinkpad

408	28	nokia lumia 635
1692	28	macbook air
556	28	ipad air
346	28	nexus 7
751	28	dell inspiron desktop
1046	28	iphone 5s
348	28	kindle fire
319	28	htc one
628	28	hp pavilion desktop
368	28	ipad mini
790	28	iphone 4s
549	28	acer aspire notebook
52	28	amazon fire phone
266	28	nexus 10
955	28	nexus 5
120	28	samsung galaxy note
344	28	mac mini
305	28	acer aspire desktop
309	28	windows surface
516	28	asus chromebook
102	28	samsung galaxy tablet
2464	29	lenovo thinkpad
1713	29	macbook air
1610	29	iphone 5
468	29	nokia lumia 635
567	29	dell inspiron desktop
3189	29	macbook pro
942	29	iphone 5s
369	29	ipad mini
297	29	kindle fire
592	29	acer aspire notebook
275	29	nexus 10
1193	29	dell inspiron notebook
397	29	nexus 7
534	29	asus chromebook
612	29	iphone 4s
747	29	hp pavilion desktop
215	29	acer aspire desktop
1478	29	samsung galaxy s4
802	29	nexus 5

143	29	samsung galaxy note
628	29	ipad air
94	29	amazon fire phone
121	29	samsung galaxy tablet
344	29	mac mini
231	29	htc one
263	29	windows surface
3603	30	macbook pro
1215	30	samsung galaxy s4
2614	30	lenovo thinkpad
654	30	acer aspire notebook
320	30	mac mini
750	30	iphone 4s
1177	30	iphone 5s
1503	30	dell inspiron notebook
1558	30	iphone 5
1743	30	macbook air
633	30	nexus 7
999	30	nexus 5
377	30	ipad mini
691	30	dell inspiron desktop
574	30	asus chromebook
665	30	ipad air
473	30	hp pavilion desktop
159	30	samsung galaxy note
235	30	kindle fire
340	30	nokia lumia 635
408	30	acer aspire desktop
290	30	nexus 10
139	30	samsung galaxy tablet
172	30	windows surface
172	30	amazon fire phone
307	30	htc one
582	31	ipad air
671	31	iphone 5s
469	31	dell inspiron desktop
1514	31	iphone 5
2129	31	lenovo thinkpad
636	31	iphone 4s

1252	31	dell inspiron notebook
3649	31	macbook pro
218	31	windows surface
1586	31	macbook air
1083	31	samsung galaxy s4
694	31	nexus 5
113	31	samsung galaxy note
641	31	asus chromebook
411	31	nexus 7
562	31	acer aspire notebook
605	31	hp pavilion desktop
386	31	acer aspire desktop
276	31	nexus 10
304	31	nokia lumia 635
233	31	mac mini
137	31	kindle fire
81	31	samsung galaxy tablet
242	31	ipad mini
118	31	htc one
157	31	amazon fire phone
1323	32	iphone 5
3372	32	macbook pro
1921	32	lenovo thinkpad
323	32	iphone 4s
587	32	acer aspire notebook
119	32	samsung galaxy note
78	32	samsung galaxy tablet
1242	32	dell inspiron notebook
788	32	iphone 5s
824	32	samsung galaxy s4
166	32	amazon fire phone
71	32	kindle fire
522	32	dell inspiron desktop
683	32	nexus 5
619	32	asus chromebook
262	32	ipad mini
240	32	nexus 7
475	32	ipad air
1283	32	macbook air

558	32	hp pavilion desktop
325	32	nexus 10
358	32	acer aspire desktop
88	32	windows surface
359	32	nokia lumia 635
122	32	mac mini
149	32	htc one
368	33	acer aspire desktop
414	33	dell inspiron desktop
131	33	samsung galaxy note
382	33	ipad air
355	33	iphone 4s
651	33	nexus 5
3243	33	macbook pro
725	33	iphone 5s
383	33	hp pavilion desktop
505	33	acer aspire notebook
1639	33	macbook air
266	33	ipad mini
260	33	nexus 7
586	33	asus chromebook
748	33	samsung galaxy s4
337	33	mac mini
168	33	nexus 10
133	33	windows surface
124	33	kindle fire
1222	33	iphone 5
2177	33	lenovo thinkpad
142	33	htc one
87	33	samsung galaxy tablet
1025	33	dell inspiron notebook
218	33	nokia lumia 635
117	33	amazon fire phone
480	34	iphone 4s
1100	34	dell inspiron notebook
354	34	hp pavilion desktop
729	34	iphone 5s
570	34	asus chromebook
982	34	iphone 5
314	34	ipad air

1472	34	macbook air
573	34	acer aspire notebook
3182	34	macbook pro
337	34	nexus 7
784	34	nexus 5
120	34	samsung galaxy tablet
166	34	windows surface
472	34	dell inspiron desktop
276	34	htc one
1945	34	lenovo thinkpad
401	34	mac mini
152	34	nokia lumia 635
284	34	acer aspire desktop
214	34	nexus 10
896	34	samsung galaxy s4
111	34	amazon fire phone
255	34	ipad mini
97	34	samsung galaxy note
120	34	kindle fire
69	35	dell inspiron notebook
58	35	iphone 4s
8	35	nokia lumia 635
19	35	htc one
126	35	lenovo thinkpad
124	35	macbook pro
35	35	nexus 5
5	35	dell inspiron desktop
66	35	macbook air
29	35	acer aspire notebook
31	35	windows surface
22	35	ipad mini
25	35	mac mini
29	35	samsung galaxy s4
38	35	asus chromebook
7	35	acer aspire desktop
32	35	kindle fire
10	35	hp pavilion desktop
9	35	iphone 5
22	35	iphone 5s
6	35	samsung galaxy note

15	35	nexus 10
17	35	nexus 7

#Email Engagement Analysis

```

SELECT
  COUNT(user_id) users_count, action
FROM
  email_events
WHERE
  action IN ('email_open' , 'email_clickthrough')
GROUP BY action;

```

Result Set

users_count	action
20459	email_open
9010	email_clickthrough