# Operation Analytics and Investigating Metric Spike

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# Project description

- The project is on Microsoft clone where I will be working as Data Analyst Lead. I will answer different questions asked by different department by deriving insights from the data given to me.

- I will do the analysis of the database through SQL.

- I will do operation analytics which would help the company to predict the overall growth or decline of a company's fortune.

# Approach

The approach for this project is to first import the database of different tables in MYSQL from the dataset given in csv format and then find the answer for the various asked questions by using different SQL queries such as join, count, group by, order by, etc.

# Tech-Stack Used

I have used **MYSQL Workbench 8.0 CE** to do the analysis of database.

I have used MYSQL because it is highly scalable database system, it can run on multiple platforms and is freely available to us.

# CASE STUDY 1 (JOB DATA)

# A) Number of jobs reviewed

| Reviews per Hour | Reviews per Day |
|---|---|
| 96.6443 | 2319.4631 |

**INSIGHT-** According to the data the number of jobs reviewed per hour is 96.64 and number of jobs reviewed per day is 2319.46

**QUERRY-** SELECT

COUNT(event) / (SUM(time_spent) / 3600) AS review_per_hour,

COUNT(event) / (SUM(time_spent) / 86400) AS review_per_day

FROM

job_data;

# B) Throughput

| S.No | Throughput | Avg. Throughput |
|---|---|---|
| 1 | 0.0667 | 0.0667 |
| 2 | 0.04 | 0.05335 |
| 3 | 0.05 | 0.05223333 |
| 4 | 0.0455 | 0.05055 |
| 5 | 0.0909 | 0.05862 |
| 6 | 0.0096 | 0.05045 |
| 7 | 0.0179 | 0.0458 |
| 8 | 0.0222 | 0.03944286 |

- For throughput I would prefer daily metric as there is less data for the 7-day rolling to work

**INSIGHTS**- As Throughput is defined as the number of events happening per second and each row has one event happening so according to the data their respective throughput is given in the table.

For the 7 day rolling average throughput the data is for only 2 row as there is less amount of row.

**QUERRY**- CREATE VIEW throughputt AS

    (SELECT

        1 / (time_spent) AS throughput

    FROM

        job_data);

select throughput, avg(throughput) over (rows between 6 preceding and current row) as avg_throughput from throughputt;

# C) Percentage share of each language
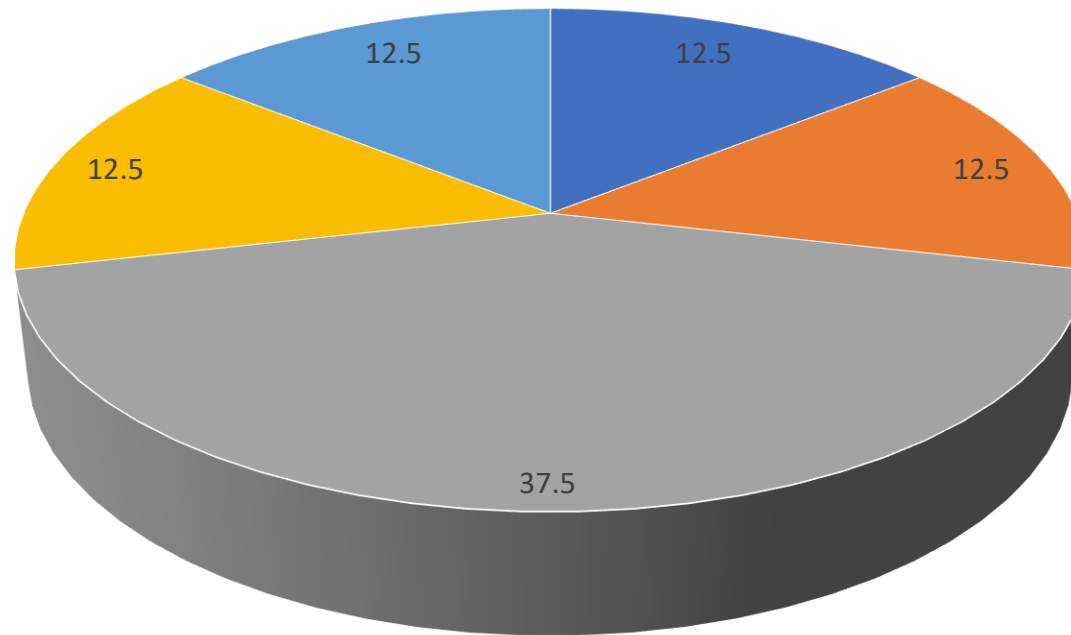


English — Arabic — Persian — Hindi — Italian

**INSIGHTS-** According to the data Persian language has the highest percentage share of 37.5% and rest of the language has 12.5% each.

**QUERRY-** SELECT
  COUNT(language)
FROM
  job_data;
SELECT
    language, (COUNT(language) / 8) * 100 as language_percentage
FROM
 job_data
GROUP BY language;

# D) Duplicate rows

After noticing the duplicates in the table I will display the duplicates from the table by grouping the table by the column which contains duplicate value and having counts more than 1.

**INSIGHTS-** In job_id 23 is the duplicate value and in actor_id 1003 is the duplicate values

**QUERRY-** select job_id, count(job_id) from job_data group by job_id having count(job_id) > 1;

select actor_id, count(actor_id) from job_data group by actor_id having count(actor_id) > 1;

# Case Study 2
# (Investigating metric spike)

# A) User Engagement

| Week | Engagement | Week | Engagement | Week | Engagement | Week | Engagement | Week | Engagement |
|------|-----------|------|-----------|------|-----------|------|-----------|------|-----------|
| 0 | 22 | 11 | 53 | 22 | 18459 | 33 | 16202 | 44 | 53 |
| 1 | 57 | 12 | 42 | 23 | 18330 | 34 | 16179 | 45 | 54 |
| 2 | 52 | 13 | 49 | 24 | 19105 | 35 | 830 | 46 | 60 |
| 3 | 51 | 14 | 45 | 25 | 18695 | 36 | 51 | 47 | 46 |
| 4 | 48 | 15 | 34 | 26 | 19117 | 37 | 59 | 48 | 51 |
| 5 | 66 | 16 | 63 | 27 | 19938 | 38 | 63 | 49 | 61 |
| 6 | 63 | 17 | 7443 | 28 | 20830 | 39 | 51 | 50 | 49 |
| 7 | 61 | 18 | 15907 | 29 | 20122 | 40 | 63 | 51 | 55 |
| 8 | 50 | 19 | 16722 | 30 | 21584 | 41 | 65 | 52 | 35 |
| 9 | 46 | 20 | 17893 | 31 | 18610 | 42 | 53 | 53 | 1 |
| 10 | 46 | 21 | 17158 | 32 | 16674 | 43 | 59 | | |

**INSIGHTS-** The weekly user engagement is given in the table above. We see that week 30 has the highest engagement with 21584 engagement and week 53 has least engagement with 1 engagement.

**QUERRY-**

SELECT

  WEEK(occoured_at) AS week, COUNT(event_type) AS engagement

FROM

      events

WHERE    event_type = 'engagement'

GROUP BY WEEK(occoured_at);

# B) User Growth

| Month | Users | Month | Users |
|-------|-------|-------|-------|
| 1 | 34 | 7 | 3081 |
| 2 | 31 | 8 | 2827 |
| 3 | 34 | 9 | 33 |
| 4 | 32 | 10 | 31 |
| 5 | 2303 | 11 | 37 |
| 6 | 2630 | 12 | 32 |
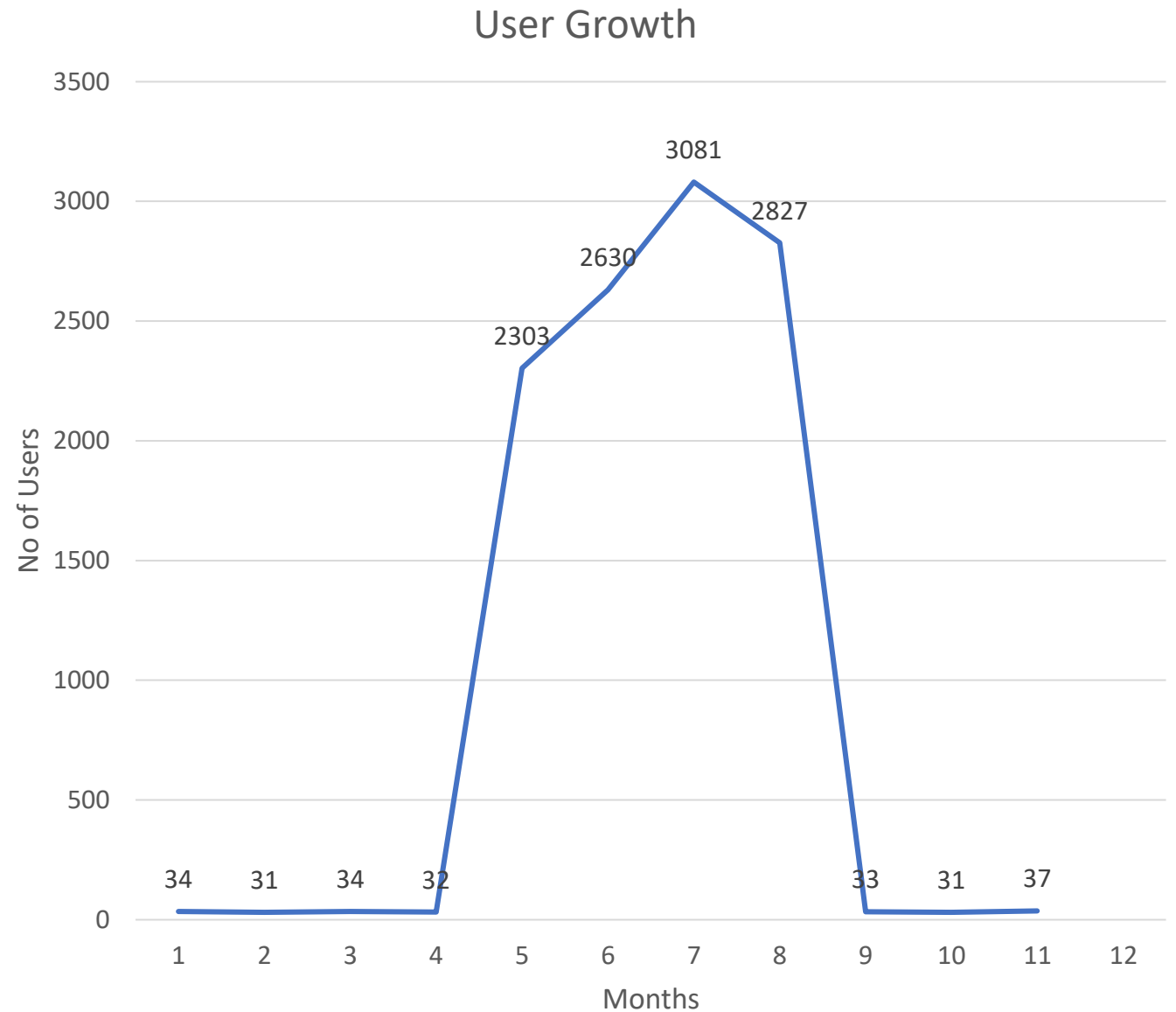


User Growth

**INSIGHTS-** As we can see from the table and the graph that the user growth was highest in the 5<sup>th</sup> month and was lowest in 9<sup>th</sup> month.

**QUERRY-**

```
SELECT
        COUNT(DISTINCT user_id) AS number_of_user,
        MONTH(occoured_at)
FROM
        events
WHERE
        event_type = 'engagement'
GROUP BY MONTH(occoured_at);
```

# C) Weekly Retention

| Week | Active Users | Week | Active Users | Week | Active Users | Week | Active Users |
|---|---|---|---|---|---|---|---|
| 0 | 16 | 14 | 23 | 28 | 1601 | 42 | 21 |
| 1 | 19 | 15 | 27 | 29 | 1629 | 43 | 23 |
| 2 | 27 | 16 | 17 | 30 | 1725 | 44 | 19 |
| 3 | 25 | 17 | 610 | 31 | 1532 | 45 | 22 |
| 4 | 27 | 18 | 950 | 32 | 1477 | 46 | 24 |
| 5 | 16 | 19 | 1237 | 33 | 1457 | 47 | 29 |
| 6 | 19 | 20 | 1357 | 34 | 1470 | 48 | 23 |
| 7 | 21 | 21 | 1312 | 35 | 140 | 49 | 22 |
| 8 | 26 | 22 | 1394 | 36 | 25 | 50 | 26 |
| 9 | 24 | 23 | 1465 | 37 | 23 | 51 | 20 |
| 10 | 19 | 24 | 1492 | 38 | 17 | 52 | 21 |
| 11 | 21 | 25 | 1480 | 39 | 26 | 53 | 2 |
| 12 | 26 | 26 | 1527 | 40 | 16 | | |
| 13 | 23 | 27 | 1593 | 41 | 20 | | |

**INSIGHTS-** Table shows the weekly active users and hence the amount of users retained every week.

**QUERRY-** SELECT

WEEK(occoured_at) AS week,

COUNT(DISTINCT user_id) AS no_of_users

FROM

events

GROUP BY WEEK(occoured_at);

# D) Weekly Engagement

| Week | Device | Engagement | Week | Device | Engagement | Week | Device | Engagement | Week | Device | Engagement |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 0 | macbook air | 3 | 1 | iphone 4s | 7 | 3 | lenovo thinkpad | 8 | 4 | dell inspiron notebook | 3 |
| 0 | samsung galaxy note | 2 | 1 | ipad mini | 4 | 3 | macbook pro | 9 | 4 | ipad air | 7 |
| 0 | lenovo thinkpad | 6 | 1 | nexus 7 | 5 | 3 | samsung galaxy s4 | 15 | 5 | macbook pro | 15 |
| 0 | macbook pro | 3 | 1 | nexus 5 | 4 | 3 | amazon fire phone | 2 | 5 | nexus 7 | 6 |
| 0 | samsung galaxy s4 | 3 | 1 | iphone 5s | 1 | 3 | acer aspire notebook | 2 | 5 | mac mini | 3 |
| 0 | nexus 5 | 3 | 2 | macbook pro | 14 | 3 | ipad air | 7 | 5 | iphone 5 | 3 |
| 0 | iphone 5s | 2 | 2 | lenovo thinkpad | 5 | 3 | macbook air | 7 | 5 | amazon fire phone | 7 |
| 1 | macbook air | 7 | 2 | samsung galaxy s4 | 5 | 3 | iphone 4s | 1 | 5 | samsung galaxy note | 5 |
| 1 | macbook pro | 10 | 2 | macbook air | 2 | 4 | macbook pro | 11 | 5 | macbook air | 12 |
| 1 | samsung galaxy note | 2 | 2 | nokia lumia 635 | 2 | 4 | samsung galaxy s4 | 5 | 5 | ipad air | 3 |
| 1 | dell inspiron notebook | 3 | 2 | iphone 4s | 12 | 4 | lenovo thinkpad | 5 | 5 | dell inspiron notebook | 3 |
| 1 | lenovo thinkpad | 3 | 2 | ipad mini | 2 | 4 | amazon fire phone | 7 | 5 | samsung galaxy s4 | 9 |
| 1 | samsung galaxy s4 | 6 | 2 | nexus 7 | 3 | 4 | acer aspire notebook | 1 | 6 | nexus 7 | 3 |
| 1 | nokia lumia 635 | 5 | 2 | nexus 5 | 7 | 4 | macbook air | 9 | 6 | ipad mini | 4 |

| Week | Device | Engagement | Week | Device | Engagement | Week | Device | Engagement | Week | Device | Engagement | Week | Device | Engagement | Week | Device | Engagement | Week | Device | Engagement |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 6 | iphone 5 | 5 | 7 | lenovo thinkpad | 7 | 9 | mac mini | 3 | 11 | samsung galaxy s4 | 7 | 13 | macbook air | 6 | 16 | iphone 5s | 6 | 17 | dell inspiron desktop | 176 |
| 6 | macbook pro | 13 | 7 | nexus 5 | 4 | 10 | nexus 5 | 11 | 11 | macbook air | 6 | 13 | lenovo thinkpad | 10 | 16 | macbook air | 2 | 17 | kindle fire | 59 |
| 6 | amazon fire phone | 7 | 8 | nexus 5 | 7 | 10 | hp pavilion desktop | 7 | 11 | windows surface | 7 | 13 | hp pavilion desktop | 1 | 16 | macbook pro | 9 | 17 | iphone 5 | 641 |
| 6 | samsung galaxy note | 2 | 8 | dell inspiron notebook | 7 | 10 | acer aspire desktop | 2 | 12 | lenovo thinkpad | 10 | 13 | iphone 5 | 7 | 16 | iphone 5 | 10 | 17 | samsung galaxy s4 | 405 |
| 6 | macbook air | 14 | 8 | amazon fire phone | 4 | 10 | macbook air | 9 | 12 | acer aspire notebook | 2 | 14 | macbook pro | 11 | 16 | nexus 5 | 4 | 17 | asus chromebook | 240 |
| 6 | ipad air | 5 | 8 | macbook pro | 19 | 10 | macbook pro | 4 | 12 | nexus 7 | 1 | 14 | asus chromebook | 3 | 16 | hp pavilion desktop | 6 | 17 | mac mini | 56 |
| 6 | dell inspiron notebook | 6 | 8 | nexus 10 | 1 | 10 | dell inspiron notebook | 2 | 12 | asus chromebook | 2 | 14 | nokia lumia 635 | 7 | 16 | ipad air | 7 | 17 | nexus 10 | 145 |
| 6 | lenovo thinkpad | 1 | 8 | nexus 7 | 4 | 10 | nexus 7 | 6 | 12 | samsung galaxy note | 5 | 14 | iphone 5 | 12 | 16 | samsung galaxy s4 | 6 | 17 | lenovo thinkpad | 709 |
| 6 | samsung galaxy s4 | 2 | 8 | hp pavilion desktop | 1 | 10 | samsung galaxy s4 | 5 | 12 | macbook pro | 3 | 14 | lenovo thinkpad | 5 | 16 | dell inspiron desktop | 7 | 17 | iphone 4s | 191 |
| 6 | nexus 5 | 1 | 8 | lenovo thinkpad | 7 | 11 | dell inspiron notebook | 9 | 12 | dell inspiron notebook | 4 | 14 | ipad air | 7 | 16 | lenovo thinkpad | 6 | 17 | ipad mini | 180 |
| 7 | ipad mini | 7 | 9 | nexus 5 | 7 | 11 | lenovo thinkpad | 1 | 12 | samsung galaxy s4 | 1 | 15 | macbook pro | 9 | 17 | dell inspiron notebook | 485 | 17 | nokia lumia 635 | 104 |
| 7 | iphone 5 | 10 | 9 | dell inspiron notebook | 2 | 11 | hp pavilion desktop | 6 | 12 | hp pavilion desktop | 7 | 15 | iphone 5s | 3 | 17 | macbook pro | 1436 | 17 | acer aspire notebook | 185 |
| 7 | amazon fire phone | 8 | 9 | iphone 5 | 2 | 11 | nexus 7 | 1 | 12 | windows surface | 7 | 15 | iphone 5 | 9 | 17 | macbook air | 461 | 17 | samsung galaxy note | 108 |
| 7 | macbook pro | 11 | 9 | macbook pro | 20 | 11 | asus chromebook | 4 | 13 | acer aspire notebook | 2 | 15 | nokia lumia 635 | 2 | 17 | ipad air | 325 | 17 | nexus 7 | 147 |
| 7 | nexus 10 | 2 | 9 | macbook air | 2 | 11 | iphone 5 | 6 | 13 | macbook pro | 12 | 15 | ipad air | 7 | 17 | iphone 5s | 452 | 17 | htc one | 186 |
| 7 | macbook air | 11 | 9 | nexus 7 | 8 | 11 | macbook pro | 5 | 13 | nokia lumia 635 | 10 | 15 | samsung galaxy s4 | 3 | 17 | nexus 5 | 361 | 17 | windows surface | 87 |
| 7 | hp pavilion desktop | 1 | 9 | lenovo thinkpad | 2 | 11 | nexus 5 | 1 | 13 | samsung galaxy note | 1 | 15 | lenovo thinkpad | 1 | 17 | hp pavilion desktop | 120 | 17 | acer aspire desktop | 58 |

| W | D | E | W | D | E | W | D | E | W | D | E | W | D | E | W | D | E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 17 | samsumg galaxy tablet | 54 | 18 | mac mini | 154 | 19 | nexus 7 | 330 | 19 | dell inspiron desktop | 438 | 20 | iphone 5s | 1024 | 21 | dell inspiron notebook | 955 | 21 | nokia lumia 635 | 190 |
| 17 | amazon fire phone | 72 | 18 | amazon fire phone | 141 | 19 | dell inspiron notebook | 1184 | 19 | acer aspire desktop | 242 | 20 | samsung galaxy s4 | 991 | 21 | asus chromebook | 550 | 21 | kindle fire | 355 |
| 18 | dell inspiron notebook | 877 | 18 | ipad mini | 245 | 19 | samsung galaxy s4 | 976 | 19 | samsumg galaxy tablet | 66 | 20 | samsung galaxy note | 160 | 21 | lenovo thinkpad | 1893 | 21 | mac mini | 281 |
| 18 | iphone 5 | 1273 | 18 | iphone 4s | 419 | 19 | mac mini | 230 | 20 | iphone 5 | 1281 | 20 | mac mini | 272 | 21 | acer aspire desktop | 325 | 21 | amazon fire phone | 29 |
| 18 | macbook air | 1439 | 18 | nexus 7 | 213 | 19 | iphone 5s | 945 | 20 | iphone 4s | 614 | 20 | dell inspiron notebook | 968 | 21 | iphone 4s | 511 | 22 | macbook air | 1720 |
| 18 | ipad air | 460 | 18 | samsung galaxy note | 108 | 19 | ipad air | 558 | 20 | windows surface | 189 | 20 | nokia lumia 635 | 148 | 21 | ipad mini | 280 | 22 | iphone 4s | 483 |
| 18 | macbook pro | 2989 | 18 | nokia lumia 635 | 323 | 19 | asus chromebook | 259 | 20 | macbook pro | 3097 | 20 | asus chromebook | 461 | 21 | dell inspiron desktop | 568 | 22 | macbook pro | 3061 |
| 18 | lenovo thinkpad | 1548 | 18 | htc one | 158 | 19 | htc one | 261 | 20 | nexus 5 | 1280 | 20 | nexus 10 | 217 | 21 | iphone 5s | 804 | 22 | samsung galaxy s4 | 1017 |
| 18 | dell inspiron desktop | 662 | 18 | acer aspire desktop | 274 | 19 | hp pavilion desktop | 376 | 20 | macbook air | 1450 | 20 | hp pavilion desktop | 276 | 21 | htc one | 260 | 22 | iphone 5 | 1400 |
| 18 | kindle fire | 250 | 18 | windows surface | 99 | 19 | amazon fire phone | 141 | 20 | acer aspire desktop | 231 | 20 | amazon fire phone | 104 | 21 | nexus 5 | 1020 | 22 | lenovo thinkpad | 1808 |
| 18 | samsung galaxy s4 | 1061 | 18 | samsumg galaxy tablet | 79 | 19 | samsung galaxy note | 107 | 20 | kindle fire | 246 | 20 | htc one | 365 | 21 | hp pavilion desktop | 475 | 22 | samsumg galaxy tablet | 71 |
| 18 | iphone 5s | 720 | 19 | iphone 5 | 1169 | 19 | nexus 10 | 229 | 20 | ipad air | 615 | 20 | samsumg galaxy tablet | 78 | 21 | nexus 7 | 211 | 22 | iphone 5s | 927 |
| 18 | asus chromebook | 487 | 19 | macbook air | 1297 | 19 | kindle fire | 221 | 20 | acer aspire notebook | 483 | 21 | macbook air | 1279 | 21 | nexus 10 | 258 | 22 | nokia lumia 635 | 311 |
| 18 | nexus 10 | 362 | 19 | iphone 4s | 526 | 19 | nokia lumia 635 | 215 | 20 | ipad mini | 264 | 21 | iphone 5 | 1571 | 21 | windows surface | 183 | 22 | nexus 5 | 1231 |
| 18 | acer aspire notebook | 345 | 19 | macbook pro | 3063 | 19 | acer aspire notebook | 383 | 20 | lenovo thinkpad | 2203 | 21 | samsung galaxy s4 | 964 | 21 | acer aspire notebook | 462 | 22 | windows surface | 189 |
| 18 | nexus 5 | 895 | 19 | nexus 5 | 908 | 19 | windows surface | 147 | 20 | nexus 7 | 372 | 21 | macbook pro | 3051 | 21 | samsumg galaxy tablet | 55 | 22 | dell inspiron desktop | 737 |
| 18 | hp pavilion desktop | 326 | 19 | lenovo thinkpad | 2093 | 19 | ipad mini | 358 | 20 | dell inspiron desktop | 504 | 21 | ipad air | 432 | 21 | samsung galaxy note | 196 | 22 | ipad air | 591 |

| W | D | E | W | D | E | W | D | E | W | D | E | W | D | E | W | D | E | W | D | E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 22 | nexus 10 | 311 | 23 | macbook pro | 3130 | 23 | nexus 10 | 533 | 24 | lenovo thinkpad | 1806 | 25 | nexus 5 | 937 | 25 | acer aspire notebook | 605 | 26 | macbook pro | 3309 |
| 22 | ipad mini | 342 | 23 | macbook air | 1438 | 23 | windows surface | 155 | 24 | nexus 7 | 418 | 25 | nexus 7 | 558 | 25 | hp pavilion desktop | 588 | 26 | acer aspire desktop | 313 |
| 22 | asus chromebook | 631 | 23 | samsumg galaxy tablet | 105 | 23 | amazon fire phone | 181 | 24 | kindle fire | 239 | 25 | nokia lumia 635 | 448 | 25 | mac mini | 230 | 26 | windows surface | 177 |
| 22 | dell inspiron notebook | 1011 | 23 | hp pavilion desktop | 662 | 23 | ipad air | 404 | 24 | iphone 5 | 1475 | 25 | samsung galaxy s4 | 1105 | 25 | ipad air | 640 | 26 | iphone 5 | 1602 |
| 22 | nexus 7 | 433 | 23 | nokia lumia 635 | 274 | 23 | samsung galaxy note | 183 | 24 | samsumg galaxy tablet | 101 | 25 | macbook air | 1276 | 25 | ipad mini | 234 | 26 | mac mini | 140 |
| 22 | hp pavilion desktop | 371 | 23 | nexus 7 | 303 | 24 | iphone 5s | 965 | 24 | iphone 4s | 609 | 25 | dell inspiron desktop | 649 | 25 | samsung galaxy note | 134 | 26 | asus chromebook | 632 |
| 22 | amazon fire phone | 46 | 23 | asus chromebook | 671 | 24 | macbook pro | 3041 | 24 | samsung galaxy s4 | 940 | 25 | acer aspire desktop | 265 | 26 | ipad mini | 471 | 26 | kindle fire | 254 |
| 22 | acer aspire notebook | 431 | 23 | samsung galaxy s4 | 1094 | 24 | nexus 5 | 1163 | 24 | ipad air | 619 | 25 | dell inspiron notebook | 1213 | 26 | lenovo thinkpad | 2221 | 26 | hp pavilion desktop | 512 |
| 22 | mac mini | 276 | 23 | dell inspiron desktop | 494 | 24 | nokia lumia 635 | 496 | 24 | nexus 10 | 369 | 25 | asus chromebook | 432 | 26 | nexus 7 | 430 | 26 | amazon fire phone | 137 |
| 22 | htc one | 323 | 23 | lenovo thinkpad | 1882 | 24 | macbook air | 1723 | 24 | htc one | 136 | 25 | iphone 4s | 442 | 26 | macbook air | 1503 | 26 | htc one | 225 |
| 22 | kindle fire | 231 | 23 | ipad mini | 258 | 24 | dell inspiron desktop | 716 | 24 | amazon fire phone | 147 | 25 | iphone 5s | 963 | 26 | samsung galaxy s4 | 1121 | 26 | iphone 5s | 1026 |
| 22 | acer aspire desktop | 255 | 23 | acer aspire notebook | 449 | 24 | acer aspire desktop | 294 | 24 | acer aspire notebook | 509 | 25 | iphone 5 | 1645 | 26 | ipad air | 585 | 26 | dell inspiron desktop | 672 |
| 22 | samsung galaxy note | 252 | 23 | kindle fire | 352 | 24 | asus chromebook | 471 | 24 | mac mini | 298 | 25 | htc one | 285 | 26 | iphone 4s | 507 | 26 | nexus 5 | 912 |
| 23 | iphone 4s | 462 | 23 | dell inspiron notebook | 1034 | 24 | windows surface | 209 | 24 | samsung galaxy note | 245 | 25 | amazon fire phone | 131 | 26 | dell inspiron notebook | 1081 | 26 | acer aspire notebook | 328 |
| 23 | iphone 5s | 871 | 23 | htc one | 234 | 24 | hp pavilion desktop | 721 | 25 | macbook pro | 2946 | 25 | samsumg galaxy tablet | 159 | 26 | samsung galaxy note | 103 | 26 | samsumg galaxy tablet | 139 |
| 23 | nexus 5 | 1001 | 23 | acer aspire desktop | 240 | 24 | ipad mini | 313 | 25 | kindle fire | 216 | 25 | windows surface | 234 | 26 | nokia lumia 635 | 456 | 27 | macbook pro | 3561 |
| 23 | iphone 5 | 1750 | 23 | mac mini | 170 | 24 | dell inspiron notebook | 1082 | 25 | lenovo thinkpad | 2102 | 25 | nexus 10 | 258 | 26 | nexus 10 | 261 | 27 | nexus 7 | 367 |

| W | D | E | W | D | E | W | D | E | W | D | E | W | D | E | W | D | E | W | D | E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | lenovo thinkpad | 2240 | 27 | htc one | 225 | 28 | nokia lumia 635 | 405 | 29 | samsung galaxy s4 | 1467 | 29 | dell inspiron notebook | 1179 | 30 | acer aspire notebook | 646 | 31 | lenovo thinkpad | 2131 |
| 27 | macbook air | 1657 | 27 | windows surface | 345 | 28 | macbook air | 1671 | 29 | iphone 4s | 611 | 29 | samsung galaxy note | 141 | 30 | mac mini | 316 | 31 | macbook pro | 3618 |
| 27 | samsung galaxy s4 | 1157 | 27 | acer aspire desktop | 296 | 28 | dell inspiron desktop | 744 | 29 | macbook pro | 3165 | 29 | ipad air | 620 | 30 | iphone 5s | 1164 | 31 | samsung galaxy s4 | 1070 |
| 27 | iphone 4s | 727 | 27 | acer aspire notebook | 582 | 28 | iphone 5s | 1039 | 29 | nexus 7 | 395 | 29 | amazon fire phone | 92 | 30 | dell inspiron notebook | 1488 | 31 | mac mini | 237 |
| 27 | dell inspiron notebook | 999 | 27 | nokia lumia 635 | 325 | 28 | kindle fire | 342 | 29 | asus chromebook | 538 | 29 | samsumg galaxy tablet | 120 | 30 | nexus 7 | 629 | 31 | macbook air | 1580 |
| 27 | samsung galaxy note | 138 | 27 | kindle fire | 268 | 28 | htc one | 318 | 29 | lenovo thinkpad | 2446 | 29 | mac mini | 342 | 30 | nexus 5 | 983 | 31 | ipad air | 575 |
| 27 | ipad air | 489 | 27 | samsumg galaxy tablet | 146 | 28 | hp pavilion desktop | 622 | 29 | hp pavilion desktop | 748 | 29 | htc one | 227 | 30 | ipad mini | 373 | 31 | iphone 5 | 1501 |
| 27 | amazon fire phone | 109 | 28 | nexus 7 | 356 | 28 | ipad mini | 364 | 29 | acer aspire desktop | 213 | 29 | windows surface | 260 | 30 | ipad air | 656 | 31 | samsung galaxy note | 114 |
| 27 | iphone 5s | 952 | 28 | lenovo thinkpad | 2565 | 28 | acer aspire notebook | 541 | 29 | dell inspiron desktop | 565 | 30 | samsung galaxy s4 | 1208 | 30 | hp pavilion desktop | 466 | 31 | iphone 5s | 663 |
| 27 | iphone 5 | 1867 | 28 | macbook pro | 3475 | 28 | amazon fire phone | 51 | 29 | macbook air | 1691 | 30 | lenovo thinkpad | 2594 | 30 | samsung galaxy note | 156 | 31 | dell inspiron desktop | 465 |
| 27 | hp pavilion desktop | 589 | 28 | samsung galaxy s4 | 1262 | 28 | nexus 10 | 261 | 29 | iphone 5 | 1593 | 30 | iphone 4s | 747 | 30 | kindle fire | 234 | 31 | iphone 4s | 631 |
| 27 | mac mini | 169 | 28 | asus chromebook | 517 | 28 | nexus 5 | 946 | 29 | nokia lumia 635 | 461 | 30 | macbook pro | 3588 | 30 | nokia lumia 635 | 333 | 31 | dell inspiron notebook | 1242 |
| 27 | nexus 10 | 320 | 28 | iphone 4s | 788 | 28 | mac mini | 340 | 29 | iphone 5s | 932 | 30 | asus chromebook | 574 | 30 | nexus 10 | 282 | 31 | windows surface | 216 |
| 27 | nexus 5 | 1015 | 28 | dell inspiron notebook | 1188 | 28 | acer aspire desktop | 303 | 29 | ipad mini | 364 | 30 | macbook air | 1734 | 30 | samsumg galaxy tablet | 137 | 31 | nexus 5 | 684 |
| 27 | dell inspiron desktop | 541 | 28 | samsung galaxy note | 121 | 28 | windows surface | 304 | 29 | kindle fire | 293 | 30 | iphone 5 | 1539 | 30 | windows surface | 170 | 31 | asus chromebook | 636 |
| 27 | ipad mini | 344 | 28 | ipad air | 551 | 28 | samsumg galaxy tablet | 102 | 29 | acer aspire notebook | 592 | 30 | acer aspire desktop | 405 | 30 | amazon fire phone | 170 | 31 | nexus 7 | 407 |
| 27 | asus chromebook | 510 | 28 | iphone 5 | 1654 | 29 | nexus 5 | 795 | 29 | nexus 10 | 272 | 30 | dell inspiron desktop | 686 | 30 | htc one | 306 | 31 | acer aspire notebook | 554 |

| W | D | E | W | D | E | W | D | E | W | D | E | W | D | E | W | D | E | W | D | E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 31 | hp pavilion desktop | 601 | 32 | samsung galaxy note | 121 | 32 | htc one | 146 | 33 | hp pavilion desktop | 379 | 34 | windows surface | 164 | 34 | samsung galaxy note | 96 | 35 | ipad mini | 21 |
| 31 | acer aspire desktop | 383 | 32 | macbook pro | 3320 | 33 | samsumg galaxy tablet | 89 | 33 | macbook air | 1622 | 34 | ipad air | 308 | 34 | kindle fire | 119 | 35 | mac mini | 25 |
| 31 | nexus 10 | 274 | 32 | iphone 4s | 318 | 33 | samsung galaxy s4 | 730 | 33 | ipad mini | 260 | 34 | macbook pro | 3144 | 35 | acer aspire notebook | 36 | 35 | asus chromebook | 38 |
| 31 | nokia lumia 635 | 298 | 32 | acer aspire notebook | 580 | 33 | iphone 4s | 351 | 33 | asus chromebook | 581 | 34 | amazon fire phone | 111 | 35 | macbook air | 69 | 35 | acer aspire desktop | 7 |
| 31 | kindle fire | 136 | 32 | dell inspiron notebook | 1229 | 33 | nexus 7 | 262 | 33 | nexus 10 | 163 | 34 | samsung galaxy s4 | 890 | 35 | nexus 5 | 39 | 35 | kindle fire | 32 |
| 31 | samsumg galaxy tablet | 80 | 32 | iphone 5s | 775 | 33 | lenovo thinkpad | 2166 | 33 | windows surface | 130 | 34 | dell inspiron notebook | 1088 | 35 | samsumg galaxy tablet | 4 | 35 | hp pavilion desktop | 10 |
| 31 | ipad mini | 240 | 32 | amazon fire phone | 161 | 33 | mac mini | 342 | 33 | kindle fire | 120 | 34 | hp pavilion desktop | 351 | 35 | windows surface | 33 | 35 | iphone 5 | 9 |
| 31 | htc one | 117 | 32 | dell inspiron desktop | 519 | 33 | ipad air | 381 | 33 | htc one | 138 | 34 | iphone 5s | 715 | 35 | ipad air | 5 | 35 | iphone 5s | 22 |
| 31 | amazon fire phone | 157 | 32 | nexus 5 | 678 | 33 | acer aspire notebook | 500 | 33 | dell inspiron notebook | 1011 | 34 | iphone 5 | 966 | 35 | samsung galaxy note | 11 | 35 | nexus 10 | 15 |
| 32 | lenovo thinkpad | 1915 | 32 | asus chromebook | 611 | 33 | amazon fire phone | 121 | 33 | nokia lumia 635 | 215 | 34 | macbook air | 1456 | 35 | lenovo thinkpad | 127 | 35 | nexus 7 | 17 |
| 32 | samsumg galaxy tablet | 81 | 32 | ipad mini | 257 | 33 | iphone 5 | 1205 | 34 | samsumg galaxy tablet | 120 | 34 | nexus 5 | 770 | 35 | samsung galaxy s4 | 36 | 36 | macbook air | 2 |
| 32 | samsung galaxy s4 | 816 | 32 | macbook air | 1265 | 33 | macbook pro | 3185 | 34 | acer aspire notebook | 571 | 34 | dell inspiron desktop | 465 | 35 | dell inspiron notebook | 66 | 36 | iphone 5 | 5 |
| 32 | nexus 7 | 242 | 32 | hp pavilion desktop | 549 | 33 | acer aspire desktop | 363 | 34 | iphone 4s | 474 | 34 | htc one | 271 | 35 | iphone 4s | 57 | 36 | macbook pro | 6 |
| 32 | mac mini | 127 | 32 | nexus 10 | 318 | 33 | dell inspiron desktop | 408 | 34 | nexus 7 | 329 | 34 | nokia lumia 635 | 151 | 35 | nokia lumia 635 | 7 | 36 | dell inspiron notebook | 3 |
| 32 | ipad air | 470 | 32 | acer aspire desktop | 354 | 33 | samsung galaxy note | 127 | 34 | asus chromebook | 559 | 34 | acer aspire desktop | 281 | 35 | htc one | 18 | 36 | htc one | 2 |
| 32 | kindle fire | 70 | 32 | windows surface | 86 | 33 | nexus 5 | 641 | 34 | lenovo thinkpad | 1921 | 34 | nexus 10 | 208 | 35 | macbook pro | 122 | 36 | lenovo thinkpad | 18 |
| 32 | iphone 5 | 1309 | 32 | nokia lumia 635 | 357 | 33 | iphone 5s | 712 | 34 | mac mini | 399 | 34 | ipad mini | 252 | 35 | dell inspiron desktop | 4 | 36 | nexus 5 | 4 |

| | D | E | W | D | E | W | D | E | W | D | E | W | D | E | W | D | E | W | D | E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 36 | acer aspire notebook | 5 | 38 | ipad air | 2 | 40 | dell inspiron desktop | 2 | 42 | asus chromebook | 3 | 44 | samsung galaxy s4 | 7 | 45 | dell inspiron notebook | 7 | 47 | hp pavilion desktop | 1 |
| 36 | ipad air | 5 | 38 | samsung galaxy s4 | 5 | 40 | acer aspire notebook | 7 | 42 | htc one | 1 | 44 | macbook air | 7 | 45 | nexus 5 | 6 | 47 | nexus 5 | 4 |
| 36 | samsung galaxy s4 | 1 | 38 | iphone 5s | 7 | 40 | samsung galaxy s4 | 2 | 42 | macbook air | 3 | 44 | iphone 5 | 18 | 46 | samsung galaxy s4 | 2 | 47 | samsung galaxy s4 | 2 |
| 37 | iphone 5 | 4 | 38 | htc one | 6 | 40 | lenovo thinkpad | 4 | 42 | hp pavilion desktop | 6 | 44 | macbook pro | 4 | 46 | acer aspire notebook | 5 | 47 | dell inspiron notebook | 1 |
| 37 | dell inspiron notebook | 3 | 39 | dell inspiron notebook | 5 | 40 | windows surface | 4 | 42 | kindle fire | 3 | 44 | htc one | 6 | 46 | lenovo thinkpad | 9 | 48 | macbook air | 9 |
| 37 | macbook pro | 1 | 39 | iphone 5s | 8 | 40 | iphone 5 | 6 | 42 | iphone 4s | 2 | 44 | lenovo thinkpad | 5 | 46 | ipad mini | 5 | 48 | lenovo thinkpad | 18 |
| 37 | lenovo thinkpad | 26 | 39 | macbook pro | 20 | 41 | ipad mini | 9 | 43 | ipad mini | 8 | 44 | iphone 4s | 2 | 46 | hp pavilion desktop | 7 | 48 | iphone 5s | 6 |
| 37 | ipad mini | 5 | 39 | lenovo thinkpad | 2 | 41 | macbook pro | 25 | 43 | samsung galaxy s4 | 5 | 44 | dell inspiron notebook | 3 | 46 | iphone 5s | 11 | 48 | samsung galaxy s4 | 1 |
| 37 | macbook air | 5 | 39 | htc one | 1 | 41 | dell inspiron desktop | 7 | 43 | dell inspiron desktop | 1 | 44 | nexus 5 | 1 | 46 | macbook air | 10 | 48 | macbook pro | 7 |
| 37 | ipad air | 7 | 39 | ipad mini | 2 | 41 | acer aspire notebook | 5 | 43 | iphone 5 | 3 | 45 | samsung galaxy s4 | 7 | 46 | iphone 5 | 3 | 48 | nexus 10 | 5 |
| 37 | iphone 5s | 7 | 39 | acer aspire notebook | 2 | 41 | samsung galaxy s4 | 6 | 43 | asus chromebook | 6 | 45 | macbook air | 3 | 46 | macbook pro | 1 | 48 | acer aspire notebook | 5 |
| 37 | htc one | 1 | 39 | acer aspire desktop | 3 | 41 | windows surface | 4 | 43 | htc one | 9 | 45 | ipad mini | 3 | 46 | dell inspiron notebook | 7 | 49 | macbook air | 7 |
| 38 | dell inspiron notebook | 7 | 39 | samsung galaxy s4 | 5 | 41 | htc one | 2 | 43 | lenovo thinkpad | 7 | 45 | iphone 5 | 16 | 47 | acer aspire notebook | 2 | 49 | lenovo thinkpad | 16 |
| 38 | macbook pro | 12 | 39 | macbook air | 3 | 41 | iphone 5 | 7 | 43 | hp pavilion desktop | 2 | 45 | hp pavilion desktop | 1 | 47 | macbook pro | 11 | 49 | ipad mini | 7 |
| 38 | lenovo thinkpad | 13 | 40 | ipad mini | 12 | 42 | ipad mini | 14 | 43 | acer aspire desktop | 5 | 45 | macbook pro | 2 | 47 | macbook air | 10 | 49 | samsung galaxy s4 | 7 |
| 38 | ipad mini | 10 | 40 | macbook pro | 25 | 42 | macbook pro | 14 | 43 | macbook pro | 7 | 45 | iphone 5s | 5 | 47 | lenovo thinkpad | 9 | 49 | macbook pro | 20 |
| 38 | acer aspire desktop | 1 | 40 | htc one | 1 | 42 | dell inspiron desktop | 7 | 43 | iphone 4s | 6 | 45 | iphone 4s | 4 | 47 | iphone 5s | 6 | 49 | acer aspire notebook | 4 |

| WEEK | DEVICE | ENGAGEMENT | WEEK | DEVICE | ENGAGEMENT | WEEK | DEVICE | ENGAGEMENT |
|---|---|---|---|---|---|---|---|---|
| 50 | macbook air | 2 | 50 | nokia lumia 635 | 3 | 52 | asus chromebook | 4 |
| 50 | asus chromebook | 3 | 51 | nexus 5 | 5 | 52 | samsung galaxy note | 4 |
| 50 | nexus 5 | 2 | 51 | asus chromebook | 5 | 52 | dell inspiron notebook | 7 |
| 50 | samsung galaxy s4 | 5 | 51 | samsung galaxy s4 | 4 | 52 | acer aspire desktop | 1 |
| 50 | ipad mini | 12 | 51 | ipad mini | 1 | 52 | lenovo thinkpad | 2 |
| 50 | macbook pro | 9 | 51 | dell inspiron notebook | 5 | 52 | macbook pro | 8 |
| 50 | lenovo thinkpad | 6 | 51 | acer aspire desktop | 6 | 52 | iphone 5s | 3 |
| 50 | iphone 5s | 1 | 51 | nokia lumia 635 | 3 | 52 | iphone 4s | 4 |
| 50 | dell inspiron notebook | 3 | 51 | macbook pro | 19 | 52 | nexus 5 | 2 |
| 50 | nexus 10 | 3 | 51 | iphone 5s | 7 | 53 | lenovo thinkpad | 1 |

**INSIGHTS-** As shown in the multiple tables, the weekly engagement for different devices are depicted on the tables above to find the activeness of the user.

**QUERRY-**

SELECT

WEEK(occoured_at) AS week,

device,

COUNT(event_type) AS engagement

FROM

events

WHERE

event_type = 'engagement'

GROUP BY device , WEEK(occoured_at);

# E) Email Engagement

| Action | Count | Percentage |
|---|---|---|
| sent_weekly_digest | 57267 | |
| email_open | 20459 | 35.72 % |
| email_clickthrough | 9010 | 44.03 % |
| sent_reengagement_email | 3653 | 40.54% |

**INSIGHTS-** As given on the table, 57267 email were sent as weekly digest out of which 20459 emails were open which is 35.72%. And of the emails opened email clickthrough had 44% out of which 40% users sent reengagement email.

**QUERRY-**

SELECT

action, COUNT(action) AS count_of_action

FROM

email_events

GROUP BY action;

# Result

-I got to understand and learn how the desired data is derived from a large database which would help the App.

-I learned how to do operation analysis, I also learned about investigating metric spike and how it is important to make understand others answers to various questions.

-I also understood the kind of insights which is asked or needed by the various teams to work upon and how it would help further.

# THANK YOU

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