

# mode\_analytics\_case\_study

Problem:

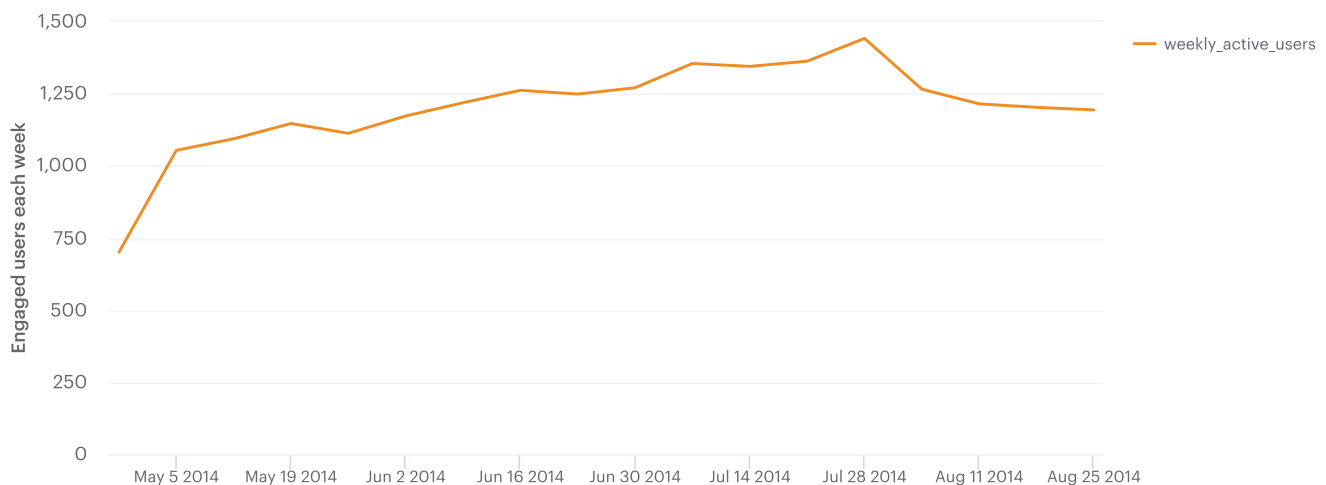
<https://community.modeanalytics.com/sql/tutorial/a-drop-in-user-engagement/>

## Are holidays responsible for the drop in user activity?

No! The second chart makes it clear that the large majority of active users are from the United States. Since the summer break in US starts in early June we should be able to notice a drop in user activity starting on the week of June 2. However, for several weeks the exact opposite happens.

This was an important hypothesis to test since all ups and downs in US activity have a greater impact on the overall user activity. This fact can be observed on the shape of the line on overall user activity, which follows a very similar trend of that of the line of the US activity drawn in the second chart.

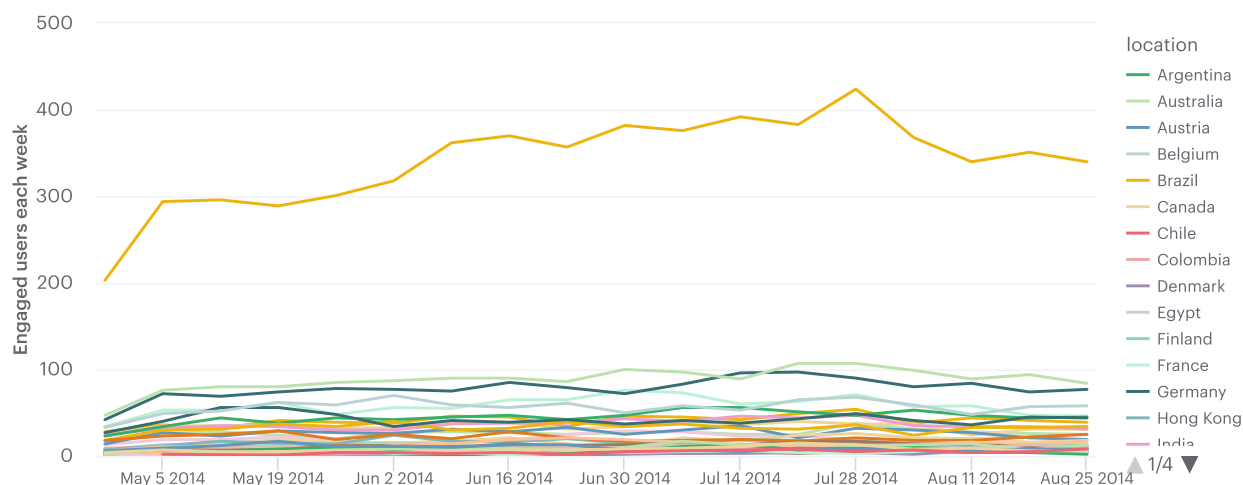
Overall User Activity (per week)



1\_weekly\_active

	date_trunc	weekly_active_users
1	2014-04-28 00:00:00	701
2	2014-05-05 00:00:00	1054
3	2014-05-12 00:00:00	1094
4	2014-05-19 00:00:00	1147
5	2014-05-26 00:00:00	1113

Weekly Active Users (per Country)



1\_weekly\_active\_per\_country

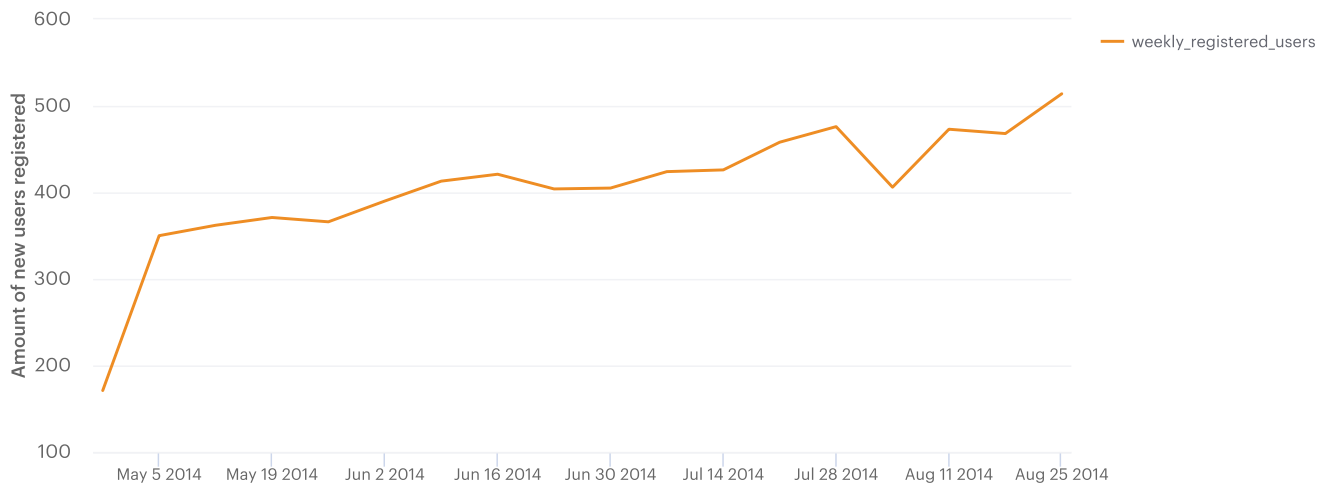
	date_trunc	location	weekly_active_users
1	2014-04-28 00:00:00	Hong Kong	1
2	2014-04-28 00:00:00	Argentina	1
3	2014-04-28 00:00:00	Turkey	2
4	2014-04-28 00:00:00	South Africa	2
5	2014-04-28 00:00:00	Chile	2

## Are the new users to blame for the drop in activity?

*Partially!*

The amount of new users registered every week seem to follow the same trend of the Overall User Activity for most weeks. On Aug 4, the Overall User Activity decreases by ~12% and the number of new users registered by ~15%. After this, both trends follow separate ways: the Overall User Activity continues to drop while the amount of new users registered increases. This means that at a high level overview there seems to be a correlation between the two. However, correlation does not imply causation, and further investigation is necessary to confirm or refute this hypothesis.

## Weekly User Registration

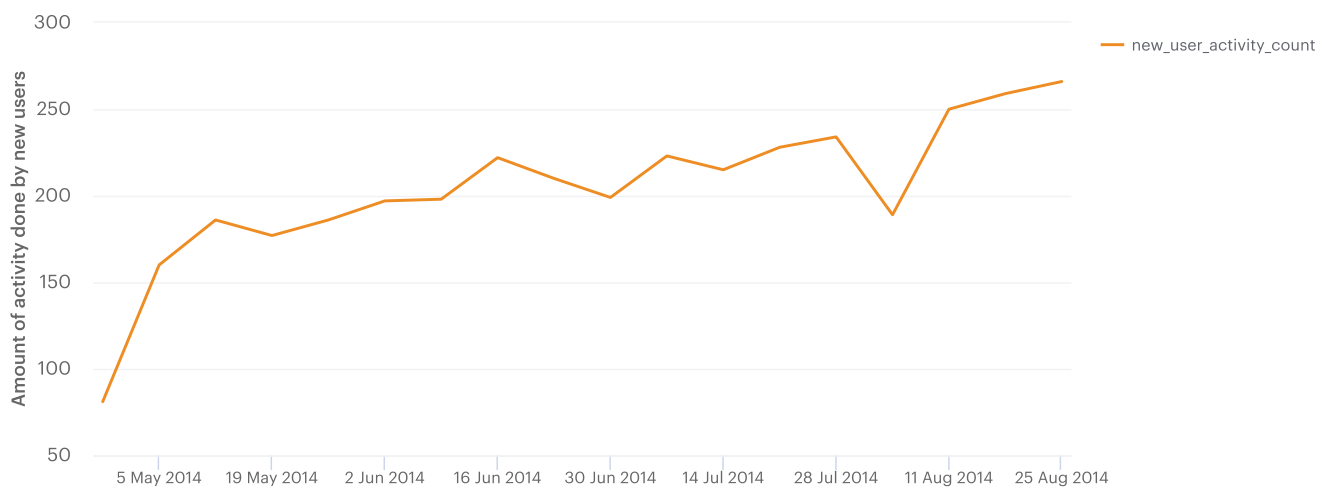


## 2\_new\_users\_registration

	date_trunc	weekly_registered_users
1	2014-04-28 00:00:00	171
2	2014-05-05 00:00:00	350
3	2014-05-12 00:00:00	362
4	2014-05-19 00:00:00	371
5	2014-05-26 00:00:00	366

Analysing the chart below reveals a ~19% drop on Aug 4 in activity from new users, i.e. from users created on that same week. It was mentioned earlier that the original drop in Overall User Activity is ~12%. For the time being, it seems reasonable to think that for at least the week of Aug 4, what caused the drop was a mixture of less users registering on the site and new users not coming back to use the platform.

## New Users Activity (per week)



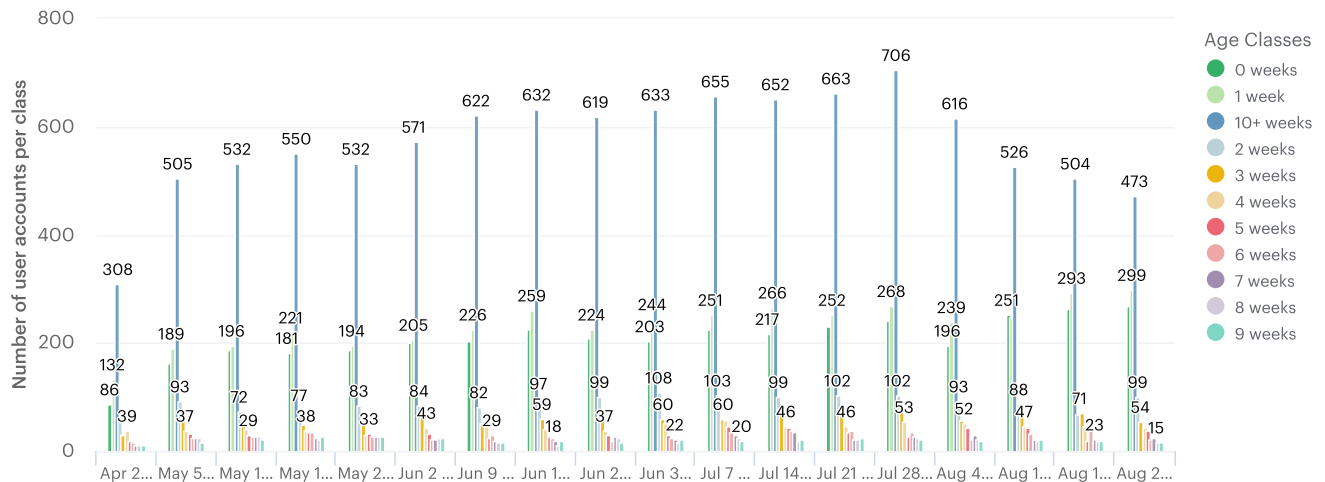
## 2\_new\_users\_activity

	week	new_user_activity_count
1	2014-04-28 00:00:00	81
2	2014-05-05 00:00:00	160
3	2014-05-12 00:00:00	186
4	2014-05-19 00:00:00	177

## Is it possible that old users are the most responsible for the drop in activity?

Yes! After grouping user activity by how old a user account is (measured in weeks), it becomes clear that users with accounts older than 10 weeks are the main driving force behind user activity. It is also possible to notice that after July 28 the number of users with 10+ weeks accounts decreases significantly, despite the number of newer users enjoying a slight increase in activity.

### User Activity based on Age (in weeks)



## 3\_old\_users\_activity

	date_trunc	0 weeks	1 week	2 weeks	3 weeks	4 weeks	5 weeks	6 weeks	7 weeks	8 weeks	9 weeks	10+ weeks
1	2014-04-28 00:00:00	86	132	56	30	39	20	17	11	10	10	308
2	2014-05-05 00:00:00	162	189	93	60	37	32	24	24	24	16	505
3	2014-05-12 00:00:00	187	196	72	57	41	29	26	26	27	22	532
4	2014-05-19 00:00:00	181	221	77	49	38	35	34	25	22	28	550
5	2014-05-26 00:00:00	188	194	83	51	30	33	26	26	26	27	532

The fact that only in the last month we observe a drop of 33% in user activity from users with accounts older than 10+ weeks is extremely important to be able to pinpoint the root cause of this exodus.

Since the platform supports access from a range of devices, it would be important to investigate if the decrease in activity is related to the decrease in usage a particular device type.

# Could there be a bug on the platform that is scaring users away?

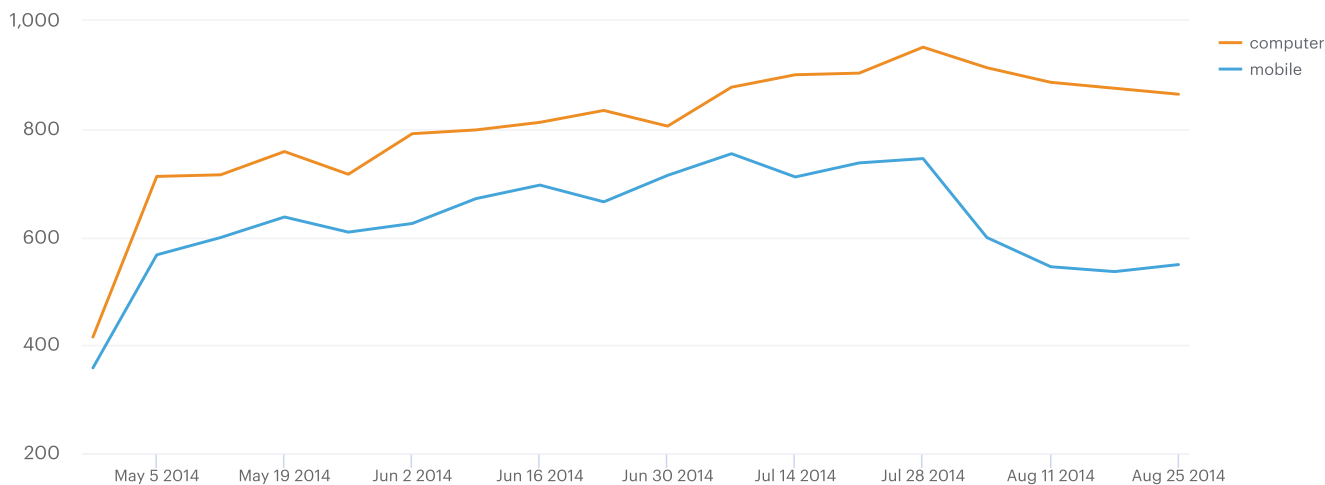
Yes! We start this part of the investigation querying the database to see how many different devices have been used to connect to the platform.

## 4\_list\_all\_devices

	device
1	ipad air
2	nexus 5
3	nexus 7
4	iphone 5s
5	macbook air

The query reveals that there are 26 devices that have been used to connect to the platform so far. To perform more meaningful analysis on this data, the devices were divided into 2 classes: computer and mobile (phone/tablet).

## User Activity by Device Category



## 4\_list\_device\_category

	week	active_users	computer	mobile
1	2014-04-28 00:00:00	701	415	358
2	2014-05-05 00:00:00	1054	712	567
3	2014-05-12 00:00:00	1094	715	599
4	2014-05-19 00:00:00	1147	758	637
5	2014-05-26 00:00:00	1113	716	609

A huge drop in activity from users connecting from mobile devices (smartphones and tablets) after July 28th can be seen on the chart above. A ~19% decrease in usage of mobile devices happens in the week of Aug 4th, coinciding with the start of the downward trend in the Overall User Activity chart.

## Conclusion

At this point, its essential to sit down and have a meeting with the mobile development team to check if there were changes made to the mobile platform after this particular day. All the research done points to a significant amount of 10+ weeks-old users leaving the platform at the same time that mobile devices become a lot less used to connect to it, indicating that a possible bug in the mobile system was introduced after July 28th.