Search Problem

The Problem

1. Should the engineering team work on Search feature next?
2. If yes, what should be modified within the Search?

Getting Oriented

How users might interact with the search?
- User might be looking for a particular topic about which he/she wants some information about.
- He see the search box and start typing his topic.
- As soon as the first few letters are typed the auto-complete drop down starts showing up.
- User might click on one of the category say "conversations" related to that topic.
- The search results page show up.
- User clicks on one of the links and get to the information he/she was looking for.

What is the purpose of search?
Search feature is there to help the users to find out what they interested in, easily and fast. It can save user's time and make his/her life easy.

General quality of an individual user's search experience?
- If the users use the search feature a lot it is an indication that the feature is useful.
- If the search similar terms again and again, it might indicate that they are not getting the results they want.
- If they click on auto-complete items, it means that they see what they were looking for.
- If they click on top 10 links on the results page, it would mean that the results are relevant and in line with what the user thought.

User table

|	user_id	created_at	company_id	language	activated_at	state
1	0	2013-01-01 20:59:39	5737	english	2013-01-01 21:01:07	active
2	1	2013-01-01 13:07:46	28	english		pending
3	2	2013-01-01 10:59:05	51	english		pending
4	3	2013-01-01 18:40:36	2800	german	2013-01-01 18:42:02	active
5	4	2013-01-01 14:37:51	5110	indian	2013-01-01 14:39:05	active

Event table

	user_id	occurred_at	event_type	event_name	location	device	user_type
1	10522	2014-05-02 11:02:39	engagement	login	Japan	dell inspiron notebook	3
2	10522	2014-05-02 11:02:53	engagement	home_page	Japan	dell inspiron notebook	3
3	10522	2014-05-02 11:03:28	engagement	like_message	Japan	dell inspiron notebook	3
4	10522	2014-05-02 11:04:09	engagement	view_inbox	Japan	dell inspiron notebook	3
5	10522	2014-05-02 11:03:16	engagement	search_run	Japan	dell inspiron notebook	3

When we compare different events and how much they were used by the users, we notice following points.
- Though search is not the most popular feature, it is still called 80% of the times when the user logs into the system.
- Approximately, half of the users who do search do not click the auto-complete search terms, indicative of it being not that great.
- Only one third times when users click one of the top 10 results from the search page. That means two third times they don't find what they are looking in the top 10 results.

Counts of different Events
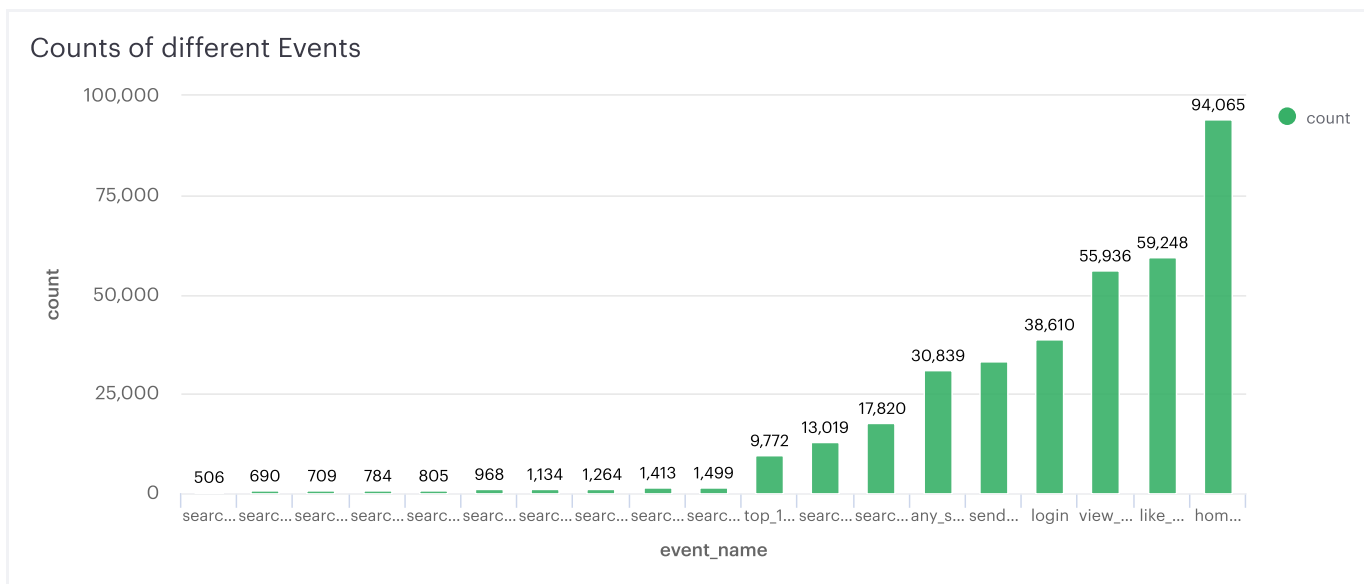
Now let us see how the much the Search and Search result click is called as compared to logins. Here the any_search_done includes with or without auto-complete both. And top_10_search_result_click is any of the top 10 result link click. Apparently Search is used in good amount of logged in sessions. And there is no outlier either for Country or Device. So we may not have any problem to fix related to country or device.

## Login vs Search vs Result Click by Devices
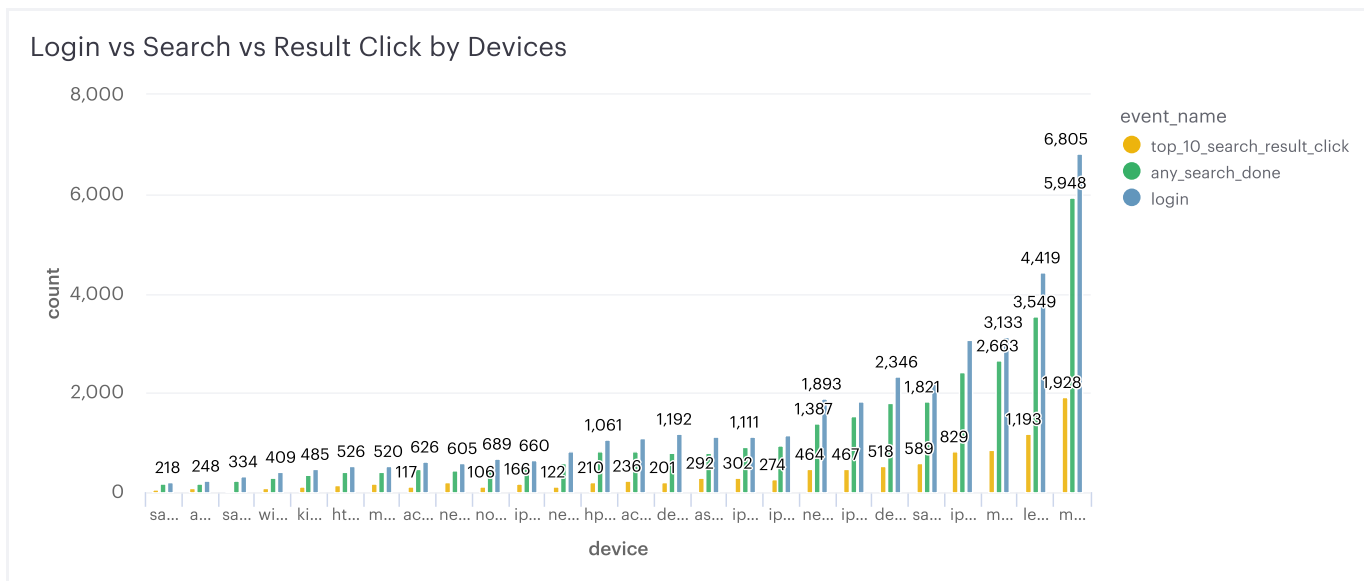
Login vs Search vs Result Click by Countries
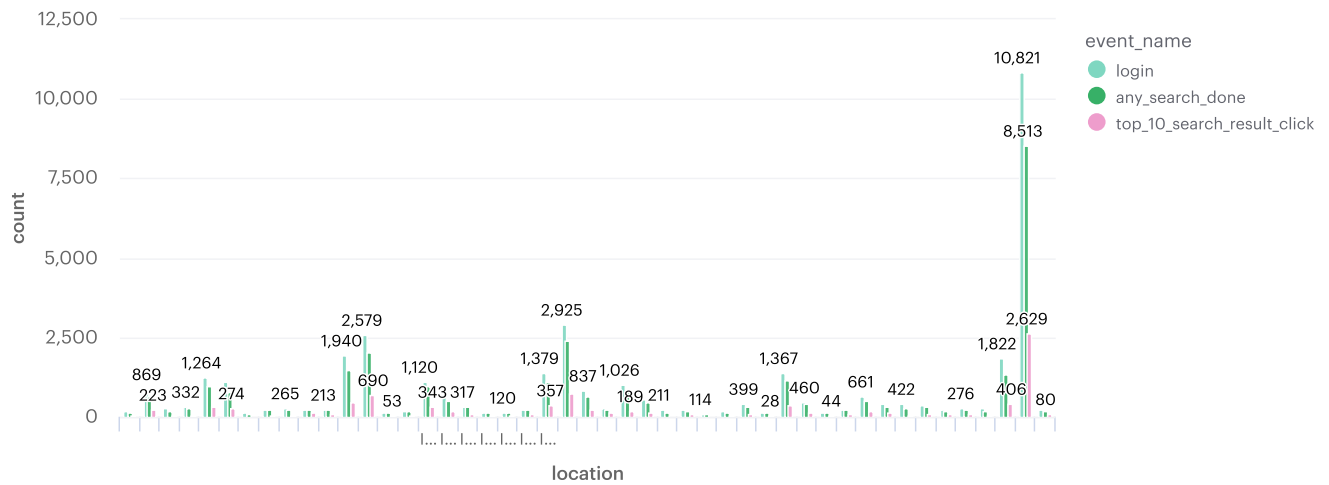
Let us define a new user session whenever there is new login. So a session would consist of all the events started after one login but before next login. Plotting searches and result click totals for every 100 session. Below chart shows that:

- Auto-complete search is called more often than the normal search. This tells that auto-complete feature is useful and is widely used.
- Search result click curve is quite low than the any of search (auto-complete/without auto-complete). This clearly shows that the search result are not as good. And there is scope for improvement because many of the times users don't click any of the search results.

Session groups(50) vs Event counts
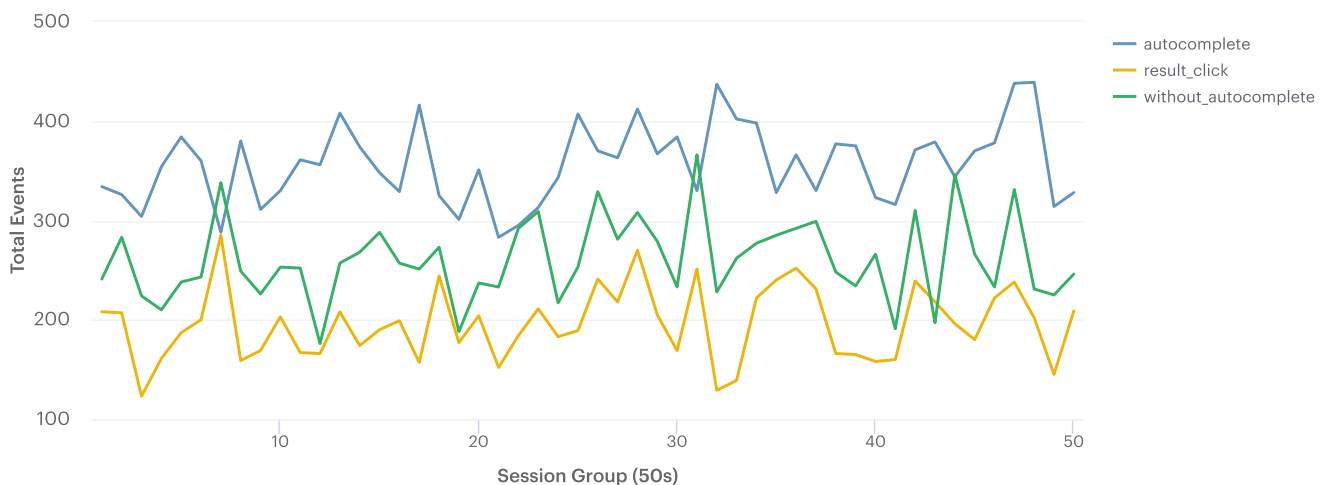
Digging down to further analyze how many searches are done before any kind of expected search result. Following graph shows that for good number of sessions users do search for 2 or more times. The highest is 19 searches before any search result clicked. This confirms that search results should be improved or the priority of results shown should be improved.

How many searches before any successful result?

Conclusion:

After all the data analysis we conclude that the Search feature is used a lot. So we should pay attention to it and see if it needs improvement. The auto-complete is working good and is used quite a lot. But the search results are not very useful. Users have to search multiple times to get to the correct results. This is where the engineering team should work next.