

Investigating a Drop in User Engagement

Step 1. Hypothesis:

1. check activities of all types of events (Table 2)
2. Less user registered (Table 1)
3. check activities of sending emails (Table 3)

In [1]:

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
```

Step 2: Number of weeks that weekly active users decreased (Week 31-35)

In [2]:

```
import datetime
```

In [3]:

```
datetime.date(2014, 7, 28).isocalendar()[1]
```

Out[3]:

31

In [4]:

```
datetime.date(2014, 8, 4).isocalendar()[1]
```

Out[4]:

32

In [5]:

```
datetime.date(2014, 8, 18).isocalendar()[1]
```

Out[5]:

34

Step 3. Start analyzing weekly active per event of table 2

In [6]:

```
table2=pd.read_csv('yammer_events.csv', parse_dates=[1])
```

In [7]:

```
table2.head(n=10)
```

Out[7]:

	user_id	occurred_at	event_type	event_name	location	device	user_type
0	10522.0	2014-05-02 11:02:39	engagement	login	Japan	dell inspiron notebook	3.0
1	10522.0	2014-05-02 11:02:53	engagement	home_page	Japan	dell inspiron notebook	3.0
2	10522.0	2014-05-02 11:03:28	engagement	like_message	Japan	dell inspiron notebook	3.0

13	Year	Week	user_id	occurred_at	event_type	event_name	location	device	user_type
	2014	31	22700	22700	22700	22700	22700	22700	21706
14	2014	32	19358	19358	19358	19358	19358	19358	18530
15	2014	33	17882	17882	17882	17882	17882	17882	16862
16	2014	34	17448	17448	17448	17448	17448	17448	16417
17	2014	35	17542	17542	17542	17542	17542	17542	16432

In [12]:

```
#check how many types of events in table 2
table2_ywet=table2.groupby(['Year','Week','event_type']).count().reset_index()
```

In [13]:

```
table2_ywet.tail(5)
```

Out[13]:

	Year	Week	event_type	user_id	occurred_at	event_name	location	device	user_type
31	2014	33	signup_flow	1270	1270	1270	1270	1270	250
32	2014	34	engagement	16158	16158	16158	16158	16158	16158
33	2014	34	signup_flow	1290	1290	1290	1290	1290	259
34	2014	35	engagement	16166	16166	16166	16166	16166	16166
35	2014	35	signup_flow	1376	1376	1376	1376	1376	266

In [14]:

```
table2_engage_tail=table2_ywet.loc[table2_ywet['event_type']=='engagement'].tail(7)
```

In [15]:

```
table2_engage_tail
```

Out[15]:

	Year	Week	event_type	user_id	occurred_at	event_name	location	device	user_type
22	2014	29	engagement	20723	20723	20723	20723	20723	20723
24	2014	30	engagement	20132	20132	20132	20132	20132	20132
26	2014	31	engagement	21472	21472	21472	21472	21472	21472
28	2014	32	engagement	18341	18341	18341	18341	18341	18341
30	2014	33	engagement	16612	16612	16612	16612	16612	16612
32	2014	34	engagement	16158	16158	16158	16158	16158	16158
34	2014	35	engagement	16166	16166	16166	16166	16166	16166

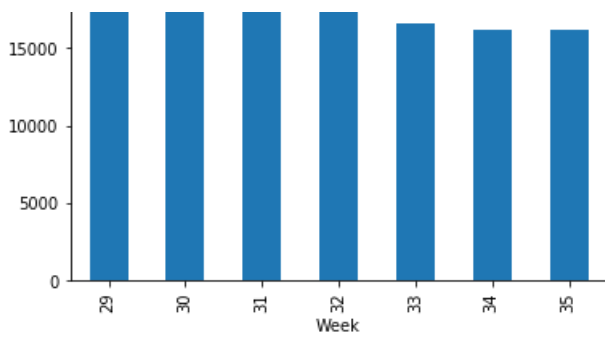
In [16]:

```
table2_engage_tail.plot(x='Week',y='user_id', kind='bar', title='engagement')
```

Out[16]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x125ea9470>
```





In [17]:

```
table2_signup_tail=table2_ywet.loc[table2_ywet['event_type']=='signup_flow'].tail(7)
```

In [18]:

```
table2_signup_tail
```

Out[18]:

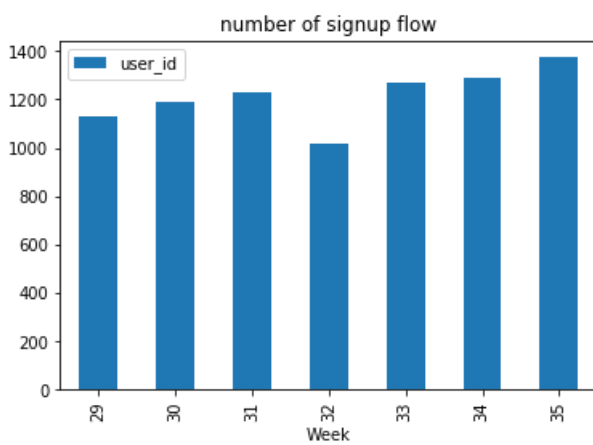
	Year	Week	event_type	user_id	occurred_at	event_name	location	device	user_type
23	2014	29	signup_flow	1130	1130	1130	1130	1130	215
25	2014	30	signup_flow	1192	1192	1192	1192	1192	228
27	2014	31	signup_flow	1228	1228	1228	1228	1228	234
29	2014	32	signup_flow	1017	1017	1017	1017	1017	189
31	2014	33	signup_flow	1270	1270	1270	1270	1270	250
33	2014	34	signup_flow	1290	1290	1290	1290	1290	259
35	2014	35	signup_flow	1376	1376	1376	1376	1376	266

In [19]:

```
table2_signup_tail.plot(x='Week', y='user_id', title='number of signup flow', kind='bar')
```

Out[19]:

<matplotlib.axes._subplots.AxesSubplot at 0x11fa9ab00>



In [20]:

```
table2_ywen=table2.groupby(['Year','Week','event_name']).count().reset_index()
```

In [21]:

```
table2_ywen.loc[table2_ywen['Week']=='19']
```

Out [21]:

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
21	2014	19	complete_signup	160	160	160	160	160	160
22	2014	19	create_user	350	350	350	350	350	0
23	2014	19	enter_email	205	205	205	205	205	0
24	2014	19	enter_info	169	169	169	169	169	0
25	2014	19	home_page	5113	5113	5113	5113	5113	5113
26	2014	19	like_message	3382	3382	3382	3382	3382	3382
27	2014	19	login	1999	1999	1999	1999	1999	1999
28	2014	19	search_autocomplete	841	841	841	841	841	841
29	2014	19	search_click_result_1	82	82	82	82	82	82
30	2014	19	search_click_result_10	26	26	26	26	26	26
31	2014	19	search_click_result_2	78	78	78	78	78	78
32	2014	19	search_click_result_3	66	66	66	66	66	66
33	2014	19	search_click_result_4	78	78	78	78	78	78
34	2014	19	search_click_result_5	66	66	66	66	66	66
35	2014	19	search_click_result_6	49	49	49	49	49	49
36	2014	19	search_click_result_7	36	36	36	36	36	36
37	2014	19	search_click_result_8	33	33	33	33	33	33
38	2014	19	search_click_result_9	54	54	54	54	54	54
39	2014	19	search_run	753	753	753	753	753	753
40	2014	19	send_message	1894	1894	1894	1894	1894	1894
41	2014	19	view_inbox	2982	2982	2982	2982	2982	2982

In [22]:

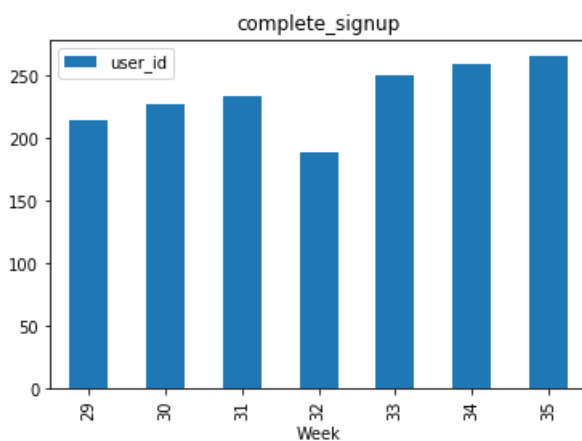
```
complete_signup_tail=table2_ywen.loc[table2_ywen['event_name']=='complete_signup'].tail(7)
```

In [23]:

```
complete_signup_tail.plot(x='Week', y='user_id', title='complete_signup', kind='bar')
```

Out [23]:

<matplotlib.axes._subplots.AxesSubplot at 0x10dcc8198>



In [24]:

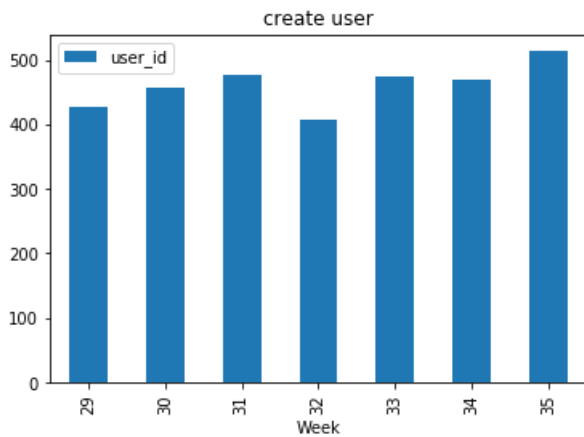
```
create_user=table2_ywen.loc[table2_ywen['event_name']=='create_user'].tail(7)
```

In [25]:

```
create_user.plot(x='Week', y='user_id', kind='bar', title='create user')
```

Out[25]:

<matplotlib.axes._subplots.AxesSubplot at 0x11e5036a0>



In [26]:

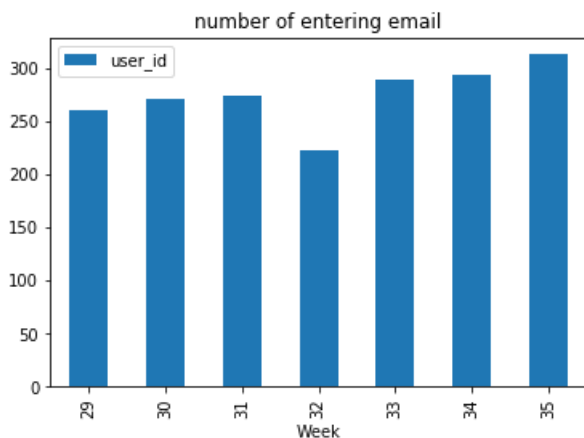
```
enter_email_tail=table2_ywen.loc[table2_ywen['event_name']=='enter_email'].tail(7)
```

In [27]:

```
enter_email_tail.plot(x='Week', y='user_id', kind='bar',title='number of entering email')
```

Out[27]:

<matplotlib.axes._subplots.AxesSubplot at 0x10f5c7668>



In [28]:

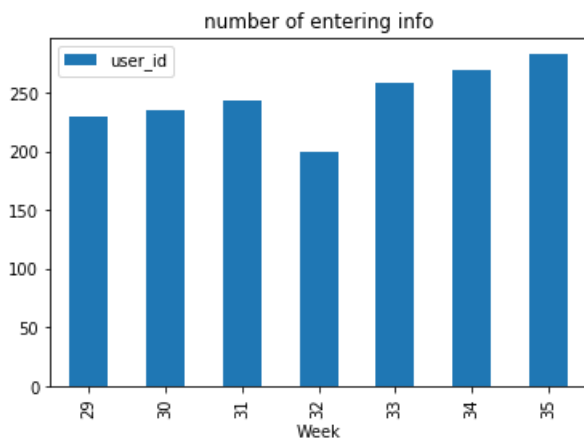
```
enter_info_tail=table2_ywen.loc[table2_ywen['event_name']=='enter_info'].tail(7)
```

In [29]:

```
enter_info_tail.plot(x='Week',y='user_id', title='number of entering info', kind='bar')
```

Out[29]:

<matplotlib.axes._subplots.AxesSubplot at 0x120a91470>



In [30]:

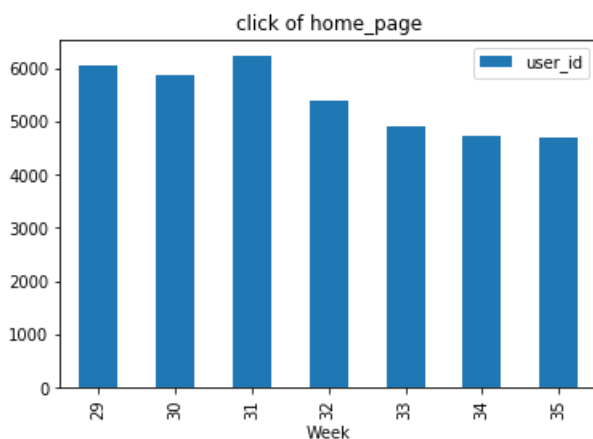
```
home_page_tail=table2_ywen.loc[table2_ywen['event_name']=='home_page'].tail(n=7)
```

In [31]:

```
home_page_tail.plot(x='Week',y='user_id',title='click of home_page',kind='bar')
```

Out[31]:

<matplotlib.axes._subplots.AxesSubplot at 0x121b852e8>



home_page had ~600 decrease

In [32]:

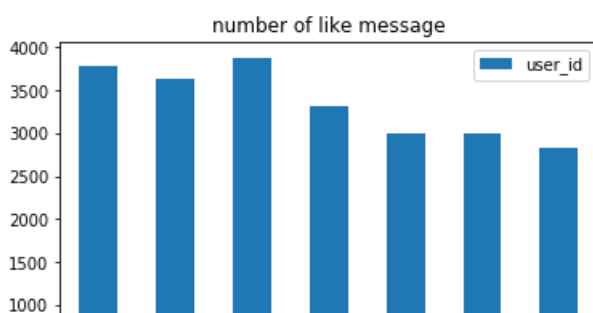
```
like_msg_tail=table2_ywen.loc[table2_ywen['event_name']=='like_message'].tail(n=7)
```

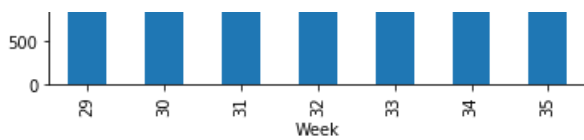
In [33]:

```
like_msg_tail.plot(x='Week', y='user_id', title='number of like message', kind='bar')
```

Out[33]:

<matplotlib.axes._subplots.AxesSubplot at 0x1236fe278>





like_message had ~300 decrease

In [34]:

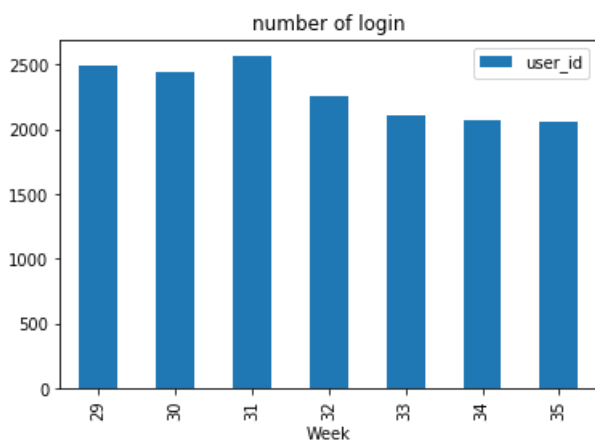
```
login_tail=table2_ywen.loc[table2_ywen['event_name']=='login'].tail(n=7)
```

In [35]:

```
login_tail.plot(x='Week',y='user_id', title='number of login', kind='bar')
```

Out[35]:

<matplotlib.axes._subplots.AxesSubplot at 0x1237e4550>



'login' ~100 decrease

In [36]:

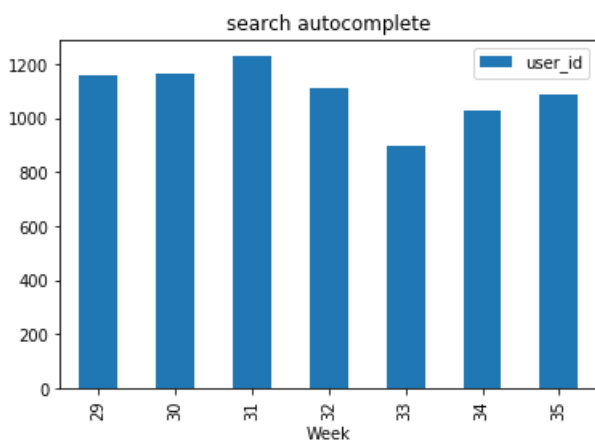
```
search_autocomplete_tail=table2_ywen.loc[table2_ywen['event_name']=='search_autocomplete'].tail(n=7)
```

In [37]:

```
search_autocomplete_tail.plot(x='Week',y='user_id',title='search autocomplete',kind='bar')
```

Out[37]:

<matplotlib.axes._subplots.AxesSubplot at 0x1238bd198>



'search_autocomplete' ~150 decrease

In [38]:


```
table2_ywen.loc[table2_ywen['event_name']=='search_click_result_1'].tail(n=7)
```

Out[38]:

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
239	2014	29	search_click_result_1	94	94	94	94	94	94
260	2014	30	search_click_result_1	92	92	92	92	92	92
281	2014	31	search_click_result_1	96	96	96	96	96	96
302	2014	32	search_click_result_1	74	74	74	74	74	74
323	2014	33	search_click_result_1	69	69	69	69	69	69
344	2014	34	search_click_result_1	40	40	40	40	40	40
365	2014	35	search_click_result_1	66	66	66	66	66	66

In [39]:

```
table2_ywen.loc[table2_ywen['event_name']=='search_click_result_2'].tail(n=7)
```

Out[39]:

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
241	2014	29	search_click_result_2	114	114	114	114	114	114
262	2014	30	search_click_result_2	83	83	83	83	83	83
283	2014	31	search_click_result_2	91	91	91	91	91	91
304	2014	32	search_click_result_2	87	87	87	87	87	87
325	2014	33	search_click_result_2	67	67	67	67	67	67
346	2014	34	search_click_result_2	60	60	60	60	60	60
367	2014	35	search_click_result_2	56	56	56	56	56	56

In [40]:

```
table2_ywen.loc[table2_ywen['event_name']=='search_click_result_3'].tail(n=7)
```

Out[40]:

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
242	2014	29	search_click_result_3	62	62	62	62	62	62
263	2014	30	search_click_result_3	67	67	67	67	67	67
284	2014	31	search_click_result_3	82	82	82	82	82	82
305	2014	32	search_click_result_3	55	55	55	55	55	55
326	2014	33	search_click_result_3	58	58	58	58	58	58
347	2014	34	search_click_result_3	39	39	39	39	39	39
368	2014	35	search_click_result_3	51	51	51	51	51	51

In [41]:

```
table2_ywen.loc[table2_ywen['event_name']=='search_click_result_4'].tail(n=7)
```

Out[41]:

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
243	2014	29	search_click_result_4	74	74	74	74	74	74

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
264	2014	30	search_click_result_4	84	84	84	84	84	84
285	2014	31	search_click_result_4	75	75	75	75	75	75
306	2014	32	search_click_result_4	73	73	73	73	73	73
327	2014	33	search_click_result_4	55	55	55	55	55	55
348	2014	34	search_click_result_4	50	50	50	50	50	50
369	2014	35	search_click_result_4	55	55	55	55	55	55

In [42]:

```
table2_ywen.loc[table2_ywen['event_name']=='search_click_result_5'].tail(n=7)
```

Out[42]:

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
244	2014	29	search_click_result_5	48	48	48	48	48	48
265	2014	30	search_click_result_5	65	65	65	65	65	65
286	2014	31	search_click_result_5	56	56	56	56	56	56
307	2014	32	search_click_result_5	53	53	53	53	53	53
328	2014	33	search_click_result_5	41	41	41	41	41	41
349	2014	34	search_click_result_5	36	36	36	36	36	36
370	2014	35	search_click_result_5	35	35	35	35	35	35

In [43]:

```
table2_ywen.loc[table2_ywen['event_name']=='search_click_result_6'].tail(n=7)
```

Out[43]:

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
245	2014	29	search_click_result_6	52	52	52	52	52	52
266	2014	30	search_click_result_6	52	52	52	52	52	52
287	2014	31	search_click_result_6	60	60	60	60	60	60
308	2014	32	search_click_result_6	38	38	38	38	38	38
329	2014	33	search_click_result_6	50	50	50	50	50	50
350	2014	34	search_click_result_6	33	33	33	33	33	33
371	2014	35	search_click_result_6	33	33	33	33	33	33

In [44]:

```
table2_ywen.loc[table2_ywen['event_name']=='search_click_result_7'].tail(n=7)
```

Out[44]:

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
246	2014	29	search_click_result_7	36	36	36	36	36	36
267	2014	30	search_click_result_7	40	40	40	40	40	40
288	2014	31	search_click_result_7	50	50	50	50	50	50
309	2014	32	search_click_result_7	47	47	47	47	47	47
330	2014	33	search_click_result_7	32	32	32	32	32	32
351	2014	34	search_click_result_7	30	30	30	30	30	30

372	2014	29	search_click_result_7	47	47	47	47	47	47
-----	------	----	-----------------------	----	----	----	----	----	----

In [45]:

```
table2_ywen.loc[table2_ywen['event_name']=='search_click_result_8'].tail(n=7)
```

Out[45]:

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
247	2014	29	search_click_result_8	50	50	50	50	50	50
268	2014	30	search_click_result_8	42	42	42	42	42	42
289	2014	31	search_click_result_8	40	40	40	40	40	40
310	2014	32	search_click_result_8	43	43	43	43	43	43
331	2014	33	search_click_result_8	26	26	26	26	26	26
352	2014	34	search_click_result_8	24	24	24	24	24	24
373	2014	35	search_click_result_8	28	28	28	28	28	28

In [46]:

```
table2_ywen.loc[table2_ywen['event_name']=='search_click_result_9'].tail(n=7)
```

Out[46]:

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
248	2014	29	search_click_result_9	52	52	52	52	52	52
269	2014	30	search_click_result_9	47	47	47	47	47	47
290	2014	31	search_click_result_9	54	54	54	54	54	54
311	2014	32	search_click_result_9	48	48	48	48	48	48
332	2014	33	search_click_result_9	29	29	29	29	29	29
353	2014	34	search_click_result_9	19	19	19	19	19	19
374	2014	35	search_click_result_9	29	29	29	29	29	29

In [47]:

```
table2_ywen.loc[table2_ywen['event_name']=='search_click_result_10'].tail(n=7)
```

Out[47]:

	Year	Week	event_name	user_id	occurred_at	event_type	location	device	user_type
240	2014	29	search_click_result_10	35	35	35	35	35	35
261	2014	30	search_click_result_10	30	30	30	30	30	30
282	2014	31	search_click_result_10	46	46	46	46	46	46
303	2014	32	search_click_result_10	27	27	27	27	27	27
324	2014	33	search_click_result_10	34	34	34	34	34	34
345	2014	34	search_click_result_10	12	12	12	12	12	12
366	2014	35	search_click_result_10	23	23	23	23	23	23

In [48]:

```
search_run_tail=table2_ywen.loc[table2_ywen['event_name']=='search_run'].tail(n=7)
```

In [49]:

```
search_run_tail.plot(x='Week', y='user_id', title='number of search run', kind='bar')
```

Out[49]:

<matplotlib.axes._subplots.AxesSubplot at 0x1239b1dd8>



'search_run' decrease ~200

In [50]:

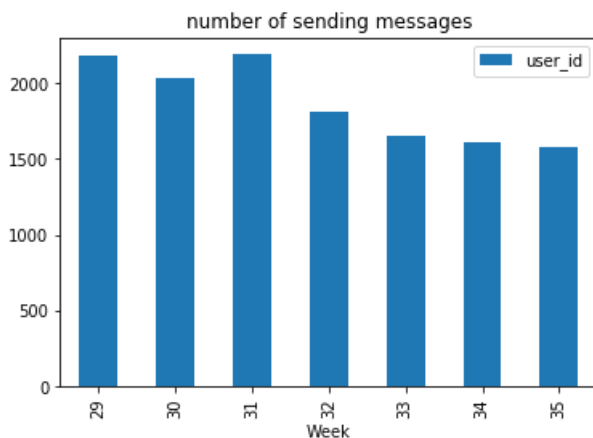
```
send_msg_tail=table2_ywen.loc[table2_ywen['event_name']=='send_message'].tail(n=7)
```

In [51]:

```
send_msg_tail.plot(x='Week', y='user_id', title='number of sending messages', kind='bar')
```

Out[51]:

<matplotlib.axes._subplots.AxesSubplot at 0x123a85748>



'send_message' decrease ~500

In [52]:

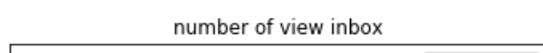
```
view_inbox_tail=table2_ywen.loc[table2_ywen['event_name']=='view_inbox'].tail(n=7)
```

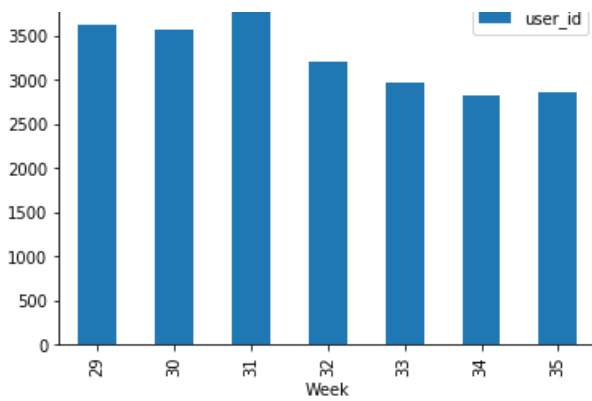
In [53]:

```
view_inbox_tail.plot(x='Week', y='user_id', title='number of view inbox', kind='bar')
```

Out[53]:

<matplotlib.axes._subplots.AxesSubplot at 0x123b5fcf8>





Conclusion:

Among the 12 types of events, the decrease in activities of the following contribute to the overall weekly activity decrease:

1. User loads the home page,
2. User likes another user's messages,
3. User logs into Yamme,
4. User runs a search query and is taken to the search results page,
5. User posts a message,
6. User views messages in the inbox What are the explanation and how to improve the product:
7. They don't find Yamme is that helpful;
8. Yamme needs to improve their search engine;
9. Yamme needs to change webdesign to make user more comfortable explore inbox, send messages etc.

Can ignore: Analysis on Table 1 and Table 3, results are not significant related to engagement decreasing.

In [54]:

```
table1=pd.read_csv('yammer_users.csv',parse_dates= [1]) #parse_dates
```

In [55]:

```
table1.head()
```

Out[55]:

	user_id	created_at	company_id	language	activated_at	state
0	0.0	2013-01-01 20:59:39	5737.0	english	2013-01-01 21:01:07	active
1	1.0	2013-01-01 13:07:46	28.0	english	NaN	pending
2	2.0	2013-01-01 10:59:05	51.0	english	NaN	pending
3	3.0	2013-01-01 18:40:36	2800.0	german	2013-01-01 18:42:02	active
4	4.0	2013-01-01 14:37:51	5110.0	indian	2013-01-01 14:39:05	active

In [56]:

```
#df['week_number_of_year'] = df['date_given'].dt.week
table1['Week'] = table1['created_at'].apply(lambda x: "%d" % (x.week))
```

In [57]:

```
table1['Year'] = table1['created_at'].apply(lambda x: "%d" % (x.year))
```

In [58]:

```
#table1.drop(columns=['year-week'], axis=1, inplace=True)
```

In [59]:

```
table1.head()
```

Out[59]:

	user_id	created_at	company_id	language	activated_at	state	Week	Year
0	0.0	2013-01-01 20:59:39	5737.0	english	2013-01-01 21:01:07	active	1	2013
1	1.0	2013-01-01 13:07:46	28.0	english	NaN	pending	1	2013
2	2.0	2013-01-01 10:59:05	51.0	english	NaN	pending	1	2013
3	3.0	2013-01-01 18:40:36	2800.0	german	2013-01-01 18:42:02	active	1	2013
4	4.0	2013-01-01 14:37:51	5110.0	indian	2013-01-01 14:39:05	active	1	2013

In [60]:

```
table1_count=table1.groupby(['Year','Week']).count().reset_index() #if not reset_index, 'Year', 'Week' will be index
```

In [61]:

```
table1_count.Week=pd.to_numeric(table1_count.Week) #if not, values type in 'Week' are str  
table1_count.Year=pd.to_numeric(table1_count.Year)
```

In [62]:

```
table1_sort=table1_count.sort_values(by=['Year','Week'])
```

In [63]:

```
table1_sort.tail(n=30)
```

Out[63]:

	Year	Week	user_id	created_at	company_id	language	activated_at	state
83	2014	6	257	257	257	257	132	257
84	2014	7	262	262	262	262	135	262
85	2014	8	272	272	272	272	127	272
86	2014	9	268	268	268	268	127	268
53	2014	10	272	272	272	272	135	272
54	2014	11	288	288	288	288	152	288
55	2014	12	286	286	286	286	132	286
56	2014	13	300	300	300	300	151	300
57	2014	14	306	306	306	306	161	306
58	2014	15	319	319	319	319	166	319
59	2014	16	303	303	303	303	165	303
60	2014	17	365	365	365	365	176	365
61	2014	18	353	353	353	353	172	353
62	2014	19	350	350	350	350	160	350
64	2014	20	362	362	362	362	186	362
65	2014	21	371	371	371	371	177	371
66	2014	22	366	366	366	366	186	366
67	2014	23	390	390	390	390	197	390
68	2014	24	413	413	413	413	198	413
69	2014	25	421	421	421	421	222	421

70	2014	Week	user_id	created_at	company_id	language	activated_at	state
71	2014	27	405	405	405	405	199	405
72	2014	28	424	424	424	424	223	424
73	2014	29	426	426	426	426	215	426
75	2014	30	458	458	458	458	228	458
76	2014	31	476	476	476	476	234	476
77	2014	32	406	406	406	406	189	406
78	2014	33	473	473	473	473	250	473
79	2014	34	468	468	468	468	259	468
80	2014	35	514	514	514	514	266	514

In [64]:

```
new_users=table1_sort['created_at'].values
```

In [65]:

```
import datetime
```

In [66]:

```
datetime.date(2014, 7, 28).isocalendar()[1]
```

Out[66]:

31

In [67]:

```
datetime.date(2014, 8, 4).isocalendar()[1]
```

Out[67]:

32

In [68]:

```
datetime.date(2014, 8, 18).isocalendar()[1]
```

Out[68]:

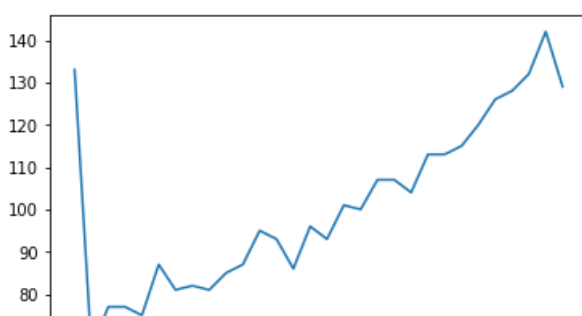
34

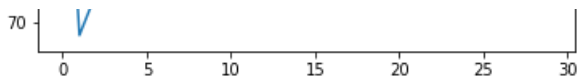
In [69]:

```
plt.plot(new_users[:30])
```

Out[69]:

[<matplotlib.lines.Line2D at 0x11ff77b00>]





In [70]:

```
table1_sort.tail(n=6)
```

Out[70]:

	Year	Week	user_id	created_at	company_id	language	activated_at	state
75	2014	30	458	458	458	458	228	458
76	2014	31	476	476	476	476	234	476
77	2014	32	406	406	406	406	189	406
78	2014	33	473	473	473	473	250	473
79	2014	34	468	468	468	468	259	468
80	2014	35	514	514	514	514	266	514

Decrease of active engagement is because of less new users

In [71]:

```
table3=pd.read_csv('yammer_emails.csv', parse_dates=[1])
```

In [72]:

```
table3.head(n=10)
```

Out[72]:

	user_id	occurred_at	action	user_type
0	0.0	2014-05-06 09:30:00	sent_weekly_digest	1.0
1	0.0	2014-05-13 09:30:00	sent_weekly_digest	1.0
2	0.0	2014-05-20 09:30:00	sent_weekly_digest	1.0
3	0.0	2014-05-27 09:30:00	sent_weekly_digest	1.0
4	0.0	2014-06-03 09:30:00	sent_weekly_digest	1.0
5	0.0	2014-06-03 09:30:25	email_open	1.0
6	0.0	2014-06-10 09:30:00	sent_weekly_digest	1.0
7	0.0	2014-06-10 09:30:24	email_open	1.0
8	0.0	2014-06-17 09:30:00	sent_weekly_digest	1.0
9	0.0	2014-06-17 09:30:23	email_open	1.0

In [73]:

```
table3['week']=table3['occurred_at'].apply(lambda x: "%d" % (x.week))
```

In [74]:

```
table3['year']=table3['occurred_at'].apply(lambda x: "%d" % (x.year))
```

In [75]:

```
table3_count=table3.groupby(['year','week']).count().reset_index()
```

In [76]:

In [/6]:

```
table3_count
```

Out[76]:

	year	week	user_id	occurred_at	action	user_type
0	2014	18	1525	1525	1525	1525
1	2014	19	4119	4119	4119	4119
2	2014	20	4290	4290	4290	4290
3	2014	21	4405	4405	4405	4405
4	2014	22	4480	4480	4480	4480
5	2014	23	4595	4595	4595	4595
6	2014	24	4796	4796	4796	4796
7	2014	25	5063	5063	5063	5063
8	2014	26	5008	5008	5008	5008
9	2014	27	5251	5251	5251	5251
10	2014	28	5465	5465	5465	5465
11	2014	29	5592	5592	5592	5592
12	2014	30	5593	5593	5593	5593
13	2014	31	5955	5955	5955	5955
14	2014	32	5767	5767	5767	5767
15	2014	33	5908	5908	5908	5908
16	2014	34	6177	6177	6177	6177
17	2014	35	6400	6400	6400	6400

Decrease of active engagement is because of less emails communications

In [77]:

```
table4=pd.read_csv('dimension_rollup_periods.csv')
```

In [78]:

```
table4.tail()
```

Out[78]:

	period_id	time_id	pst_start	pst_end	utc_start	utc_end
55997	2007.0	2015-12-31 19:00:00	2015-12-24 19:00:00	2015-12-31 19:00:00	2015-12-25 03:00:00	2016-01-01 03:00:00
55998	2007.0	2015-12-31 20:00:00	2015-12-24 20:00:00	2015-12-31 20:00:00	2015-12-25 04:00:00	2016-01-01 04:00:00
55999	2007.0	2015-12-31 21:00:00	2015-12-24 21:00:00	2015-12-31 21:00:00	2015-12-25 05:00:00	2016-01-01 05:00:00
56000	2007.0	2015-12-31 22:00:00	2015-12-24 22:00:00	2015-12-31 22:00:00	2015-12-25 06:00:00	2016-01-01 06:00:00
56001	2007.0	2015-12-31 23:00:00	2015-12-24 23:00:00	2015-12-31 23:00:00	2015-12-25 07:00:00	2016-01-01 07:00:00