



Capstone Project- Calculating Churn Rates

Learn SQL from Scratch

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1. Get familiar with Codeflix

1.1 Codeflix - Segments and Months

Codeflix has decided to analyze 2 methods of acquiring and maintaining users

- There are 2 segments available to analyze
- Each has 1000 distinct users over a 4 month period
- Churn analysis doesn't apply to the first month as we would have 0 active users to begin with

```
1 select count(DISTINCT id) as users,  
2 segment  
3 from subscriptions  
4 group by segment;
```

users	segment
1000	87
1000	30

```
1 SELECT min(subscription_end) AS earliest_end,  
   min(subscription_start) AS earliest_start,  
2 max(subscription_end) AS latest_end,  
3 max(subscription_start) AS latest_start  
4 FROM subscriptions;
```

earliest_end	earliest_start	latest_end	latest_start
2017-01-01	2016-12-01	2017-03-31	2017-03-3

2. What is the overall churn trend

2.1 Defining Months

In order to calculate churn, we will define active users at the beginning of a month and users who canceled in that month.

We will create a temporary table called months to define the range of dates that fall into each month

first_day	last_day
2017-01-01	2017-01-31
2017-02-01	2017-02-28
2017-03-01	2017-03-31

```
1  WITH months AS
2  (
3  SELECT
4      '2017-01-01' AS first_day,
5      '2017-01-31' AS last_day
6  UNION
7  SELECT
8      '2017-02-01' AS first_day,
9      '2017-02-28' AS last_day
10 UNION
11 SELECT
12     '2017-03-01' AS first_day,
13     '2017-03-31' AS last_day
14 )
15 SELECT *
16 FROM months
17 LIMIT 3;
```

2.2 Checking Subscription Status

Next, we will use a cross join to combine our subscription data with our months table.

- This makes a new, very large table as every id is paired with each month.
- This will allow us to compare a user's start and end date with the start and end date for each month

```
14 ),
15 cross_join AS (
16     SELECT *
17     FROM subscriptions
18     CROSS JOIN months
19 )
20 SELECT *
21 FROM cross_join
22 LIMIT 4;
```

id	subscription_start	subscription_end	segment	first_day	last_day
1	2016-12-01	2017-02-01	87	2017-01-01	2017-01-31
1	2016-12-01	2017-02-01	87	2017-02-01	2017-02-28
1	2016-12-01	2017-02-01	87	2017-03-01	2017-03-31
2	2016-12-01	2017-01-24	87	2017-01-01	2017-01-03

2.3 Calculating The Churn Trend

In order to calculate the churn trend, we will create a final table “status” that will use a case structure to mark users as active or canceled.

- After applying the case structure, we group the users by segment and month so that is easier to view all the churn rates at once

segment	month	churn_rate	active_users
30	2017-01-01	7.5601	291
30	2017-02-01	7.3359	518
30	2017-03-01	11.7318	716
87	2017-01-01	25.1799	278
87	2017-02-01	32.0346	462
87	2017-03-01	48.5876	531

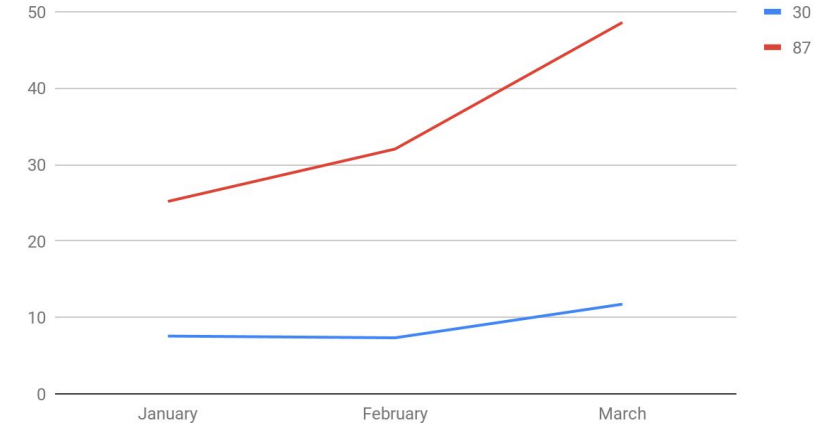
```
20 status AS (  
21   SELECT id,  
22     segment,  
23     first_day as month,  
24     CASE  
25         WHEN (subscription_start < first_day)  
26             AND  
27             (subscription_end > first_day OR subscription_end IS NULL)  
28             THEN 1  
29             ELSE 0  
30     END AS is_active,  
31     CASE  
32         WHEN (subscription_end BETWEEN first_day AND last_day)  
33             THEN 1  
34             ELSE 0  
35     END AS is_canceled  
36   FROM  
37     cross_join  
38 )  
39   SELECT segment,  
40     month,  
41     ROUND(100.0*SUM(is_canceled)/SUM(is_active),4) AS churn_rate,  
42     SUM(is_active) AS active_users  
43   FROM status  
44   GROUP BY segment, month  
45   ORDER BY segment, month;
```


3. Churn Analysis

3.1 Analysis and Recommendations

- Our analysis indicates that segment 30 has a much **smaller churn rate** as well as a **higher active user count**.
- Churn rates increased for users acquired by both segments as time went on, but the change was negligible for segment 30 users.
- The **user base for both methods continues to grow**, but segment 87 users are almost leaving as quickly as they are joining.
- We would recommend **increasing investment** in segment 30 advertising.
- However, around 40% of your users were still connected with through segment 87. We would recommend **continuing to invest** in segment 80 advertising **to maintain your user base**.

Churn Rate by Month



Active Users Per Month

