



Patient Support Analysis [p4] (UnitedHealth)

QUESTION

UnitedHealth Group has a program called Advocate4Me, which allows members to call an advocate and receive support for their health care needs – whether that's behavioural, clinical, well-being, health care financing, benefits, claims or pharmacy help.

A long-call is categorised as any call that lasts more than 5 minutes (300 seconds). What's the month-over-month growth of long-calls?

Output the year, month (both in numerical and chronological order) and growth percentage rounded to 1 decimal place.

callers Table:

Column Name	Type
policy_holder_id	integer
case_id	varchar
call_category	varchar
call_received	timestamp
call_duration_secs	integer
original_order	integer

callers Example Input:

policy_holder_id	case_id	call_category	call_received	call_duration_secs	original_order
50986511	b274-c8f0-4d5c-8704		2022-01-28T09:46:00	252	456
54026568	405a-b9be-45c2-b311	n/a	2022-01-29T16:19:00	397	217
54026568	c4cc-fd40-4780-8a53	benefits	2022-01-30T08:18:00	320	134
54026568	81e8-6abf-425b-add2	n/a	2022-02-20T17:26:00	1324	83
54475101	5919-b9c2-49a5-8091		2022-02-24T18:07:00	206	498

54624612	a17f-a415-4727-9a3f	benefits	2022-02-27T10:56:00	435	19
53777383	dfa9-e5a7-4a9b-a756	benefits	2022-03-19T00:10:00	318	69
52880317	cf00-56c4-4e76-963a	claims	2022-03-21T01:12:00	340	254
52680969	0c3c-7b87-489a-9857		2022-03-21T14:00:00	310	213
54574775	ca73-bf99-46b2-a79b	billing	2022-04-18T14:09:00	181	312
51435044	6546-61b4-4a05-9a5e		2022-04-18T21:58:00	354	439
52780643	e35a-a7c2-4718-a65d	n/a	2022-05-06T14:31:00	318	186
54026568	61ac-eee7-42fa-a674		2022-05-07T01:27:00	404	341
54674449	3d9d-e6e2-49d5-a1a0	billing	2022-05-09T11:00:00	107	450
54026568	c516-0063-4b8f-aa74		2022-05-13T01:06:00	404	270

Step 1: Identify the problem of the case

By case definition, a long call is classified as any call that lasts more than 5 minutes (300 seconds). The Monthly Increment of Long Calls must be calculated. Monthly growth is computed as the current month's calls minus the previous month's calls divided by the month before the previous month's calls. The final output should include the year, month (both numerical and chronological), and % increase rounded to one decimal point, as seen below:

Column Name	Type
yr	integer
month	integer
growth_pct	demical

Step 2 : Analyze and solve problems

First, we need to get year and month value of call_retrieved using `EXTRACT()` function and filter long calls (record with call_duration_secs value more than 300) with `WHERE`

```
SELECT policy_holder_id, case_id, call_duration_secs, call_received
      , EXTRACT(year FROM call_received) yr
      , EXTRACT(month FROM call_received) mth
FROM callers
```

Then we calculate the number of long calls per month then sort by year and month.

```
WITH tbl AS (SELECT call_duration_secs, call_received
              , EXTRACT(year FROM call_received) yr
              , EXTRACT(month FROM call_received) mth
              FROM callers
              WHERE call_duration_secs > 300 )

SELECT yr, mth
      , COUNT(*)
FROM tbl
GROUP BY yr, mth
ORDER BY mth, yr
```

Using lag create more column the number of previous calls with `LAG()` , then follow the scaling formula and round the result to 1 decimal place.

```
WITH tbl AS (SELECT call_duration_secs, call_received
              , EXTRACT(year FROM call_received) yr
              , EXTRACT(month FROM call_received) mth
              FROM callers
              WHERE call_duration_secs > 300 ),

tbl2 AS (SELECT yr, mth
              , COUNT(*) num_call
              FROM tbl
              GROUP BY yr, mth
              ORDER BY mth, yr)

SELECT yr, mth
      , ROUND(100.0*(num_call - lag(num_call)
              OVER(ORDER BY yr))/ lag(num_call)
              OVER(ORDER BY yr),1) growth_pct
FROM tbl2
```

Output

yr	mth	growth_pct
2022	1	NULL
2022	2	0.0
2022	3	400.0
2022	4	-50.0
2022	5	280.0
2022	6	15.8
2022	7	-13.6
2022	8	-26.3
2022	9	-71.4
2022	10	25.0

2022	11	120.0
2022	12	-36.4