

Row Pattern Matching in SQL

Advanced SQL

Torsten Grust, Louisa Lambrecht

University of Tübingen

Summer Term 2024

Row Pattern Matching (SQL:2016)

SQL:2016 introduced an entirely new SQL construct for *row pattern matching* ([MATCH_RECOGNIZE](#)).



As of July 2024, not supported by 🐼.

Row Pattern Matching (SQL:2016)

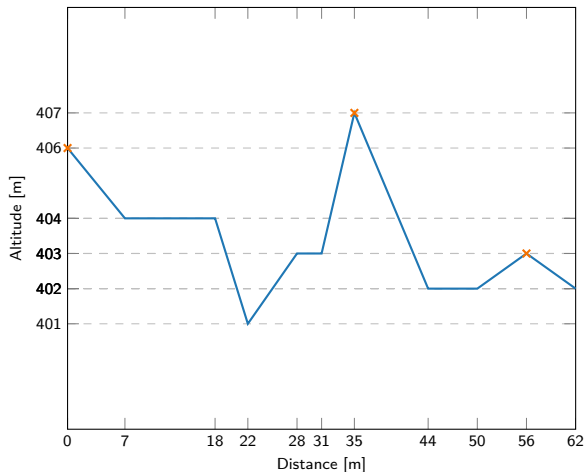
Key components of `MATCH_RECOGNIZE`:

1. `ORDER BY`: Order the rows of a table.
2. `DEFINE`: Tag rows that satisfy given predicates.
3. `PATTERN`: Specify a regular expression over row tags, find matches in the ordered sequence of rows.
4. `MEASURES`: For each match, evaluate expressions that measure its features (matched rows, length, ...).

Row Pattern Matching (SQL:2016)

```
1 SELECT *
2 FROM   map MATCH_RECOGNIZE (
3     ORDER BY x
4     MEASURES MATCH_NUMBER()      AS feature,
5                PREV(FIRST(DOWN.x)) AS start,
6                LAST(UP.x)         AS term
7     ONE ROW PER MATCH
8     AFTER MATCH SKIP PAST LAST ROW
9     PATTERN( DOWN (DOWN|EVEN)* (EVEN|UP)* UP )
10    DEFINE   UP      AS UP.alt    > PREV(UP.alt),
11             DOWN    AS DOWN.alt  < PREV(DOWN.alt),
12             EVEN    AS EVEN.alt  = PREV(EVEN.alt) } row tags
13 )
```

Row Pattern Matching (SQL:2016)



map	
x	alt
0	406
7	404
18	404
22	401
28	403
31	403
35	407
44	402
50	402
56	403
62	402

DEFINE
NULL
DOWN
EVEN
DOWN
UP
EVEN
UP
DOWN
EVEN
UP
DOWN

Row Pattern Matching (SQL:2016)

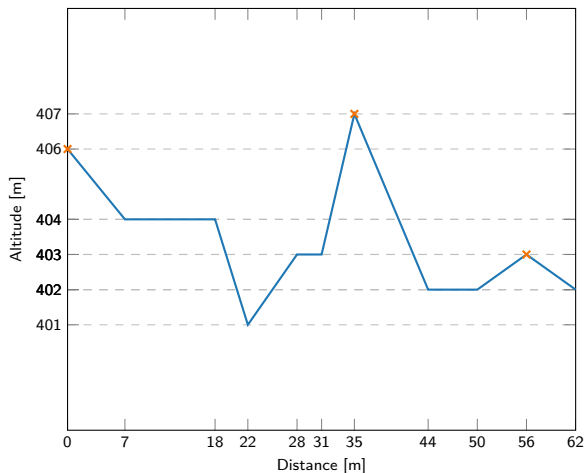
```
1 SELECT *
2 FROM map MATCH_RECOGNIZE (
3     ORDER BY x
4     MEASURES MATCH_NUMBER() AS feature,
5                PREV(FIRST(DOWN.x)) AS start,
6                LAST(UP.x) AS term
7     ONE ROW PER MATCH
8     AFTER MATCH SKIP PAST LAST ROW
9     PATTERN( DOWN (DOWN|EVEN)* (EVEN|UP)* UP )
10    DEFINE  UP AS UP.alt > PREV(UP.alt),
11            DOWN AS DOWN.alt < PREV(DOWN.alt),
12            EVEN AS EVEN.alt = PREV(EVEN.alt)
13 )
```

map		DEFINE	
x	alt		
0	406		NULL
7	404		DOWN
18	404		EVEN
22	401		DOWN
28	403		UP
31	403		EVEN
35	407		UP
44	402		DOWN
50	402		EVEN
56	403		UP
62	402		DOWN



feature	start	term
1	0	35
2	35	56

Row Pattern Matching (SQL:2016)



map		DEFINE	
x	alt		
0	406		NULL
7	404		DOWN
18	404		EVEN
22	401		DOWN
28	403		UP
31	403		EVEN
35	407		UP
44	402		DOWN
50	402		EVEN
56	403		UP
62	402		DOWN



feature	start	term
1	0	35
2	35	56