

# Darbas su duomenimis

7. Duomenų generavimas, manipuliavimas ir konvertavimas

# Eilutės – string Data

- Duomenų tipai
  - CHAR – leidžia išsaugoti iki 255 simbolių.
  - Varchar – galima išsaugoti iki 65,535 simbolių.
  - Text, galimi variantai tinytext, text, mediumtext ir longtext (iki 4GB).

```
CREATE TABLE string_tbl  
(char_fld CHAR(30),  
vchar_fld VARCHAR(30),  
text_fld TEXT  
);
```

```
INSERT INTO string_tbl (char_fld, vchar_fld, text_fld)  
VALUES ('This is char data',  
       'This is varchar data',  
       'This is text data');
```

```
UPDATE string_tbl  
SET vchar_fld = 'This is a piece of extremely long varchar data';
```

# Eilutès – string Data

```
SELECT @@session.sql_mode;
```

```
SET sql_mode='ansi';
```

# Kabutès tekste

```
UPDATE string_tbl  
SET text_fld = 'This string doesn't work';
```

```
UPDATE string_tbl  
    SET text_fld = 'This string didn''t work, but it does now';
```

```
SELECT quote(text_fld)  
FROM string_tbl;
```

# Spec. simboliai

- `SELECT CHAR(158,159,160,161,162,163,164,165);`
- `SELECT CONCAT('danke sch', CHAR(148), 'n');`

# Manipulavimas

```
DELETE FROM string_tbl;
```

```
INSERT INTO string_tbl (char_fld, varchar_fld, text_fld)  
VALUES ('This string is 28 characters',  
       'This string is 28 characters',  
       'This string is 28 characters');
```

# Komandos, kurios gražina skaičių

- `SELECT LENGTH(char_fld) FROM string_tbl;`
- `SELECT POSITION('characters' IN vchar_fld) FROM string_tbl;`
  - Jeigu neranda substring gražina 0.
- `SELECT LOCATE('is', vchar_fld, 5) FROM string_tbl;`
  - Trečias parametras nusako nuo kurios pozicijos pradėti paiešką.

# Eilučių palyginimas

```
DELETE FROM string_tbl;  
INSERT INTO string_tbl(vchar_fld)  
VALUES ('abcd'),  
      ('xyz'),  
      ('QRSTUV'),  
      ('qrstuv'),  
      ('12345');
```

```
SELECT vchar_fld  
FROM string_tbl  
ORDER BY vchar_fld;
```

```
SELECT STRCMP('12345','12345') 12345_12345,  
       STRCMP('abcd','xyz') abcd_xyz,  
       STRCMP('abcd','QRSTUV') abcd_QRSTUV,  
       STRCMP('qrstuv','QRSTUV') qrstuv_QRSTUV,  
       STRCMP('12345','xyz') 12345_xyz,  
       STRCMP('xyz','qrstuv') xyz_qrstuv;
```



```
SELECT name, name LIKE '%y' ends_in_y  
FROM category;
```

# Komandos, kurios gražina eilutę

```
DELETE FROM string_tbl;
```

```
INSERT INTO string_tbl (text_fld)
```

```
VALUES ('This string was 29 characters');
```

```
UPDATE string_tbl
```

```
SET text_fld = CONCAT(text_fld, ', but now it is longer');
```

```
SELECT concat(first_name, ' ', last_name,
```

```
' has been a customer since ', date(create_date)) cust_narrative
```

```
FROM customer;
```

# Komandos, kurios gražina eilutę

```
SELECT INSERT('goodbye world', 9, 0, 'cruel ') string;
```

```
SELECT INSERT('goodbye world', 1, 7, 'hello') string;
```

```
SELECT SUBSTRING('goodbye cruel world', 9, 5);
```

# Skaičiai

- Aritmetinės operacijos +/-/\*
- SELECT MOD(10,4);
- SELECT MOD(22.75, 5);
- SELECT POW(2,8);
- SELECT POW(2,10) kilobyte, POW(2,20) megabyte, POW(2,30) gigabyte, POW(2,40) terabyte;
- SELECT CEIL(72.445), FLOOR(72.445);
- SELECT ROUND(72.49999), ROUND(72.5), ROUND(72.50001);
  - SELECT ROUND(17, -1), TRUNCATE(17, -1);
- SELECT TRUNCATE(72.0909, 1), TRUNCATE(72.0909, 2), TRUNCATE(72.0909, 3);
- SELECT account\_id, SIGN(balance), ABS(balance) FROM account;

Function name	Description
<code>acos( x )</code>	Calculates the arc cosine of <code>x</code>
<code>asin( x )</code>	Calculates the arc sine of <code>x</code>
<code>atan( x )</code>	Calculates the arc tangent of <code>x</code>
<code>cos( x )</code>	Calculates the cosine of <code>x</code>
<code>cot( x )</code>	Calculates the cotangent of <code>x</code>
<code>exp( x )</code>	Calculates $e^x$
<code>ln( x )</code>	Calculates the natural log of <code>x</code>
<code>sin( x )</code>	Calculates the sine of <code>x</code>
<code>sqrt( x )</code>	Calculates the square root of <code>x</code>
<code>tan( x )</code>	Calculates the tangent of <code>x</code>

# Datos

- `SELECT @@global.time_zone, @@session.time_zone;`
- `SET time_zone = 'Europe/Zurich';`

Type	Default format
date	YYYY-MM-DD
datetime	YYYY-MM-DD HH:MI:SS
timestamp	YYYY-MM-DD HH:MI:SS
time	HHH:MI:SS

Component	Definition	Range
YYYY	Year, including century	1000 to 9999
MM	Month	01 (January) to 12 (December)
DD	Day	01 to 31
HH	Hour	00 to 23
HHH	Hours (elapsed)	-838 to 838
MI	Minute	00 to 59
SS	Second	00 to 59

# Datos

```
UPDATE rental
```

```
SET return_date = '2019-09-17 15:30:00'
```

```
WHERE rental_id = 99999;
```

Serveris bandys suskaidyti return\_date stringą į 6 komponentus.

Jeigu norime paversti stringą į datą

```
SELECT CAST('2019-09-17 15:30:00' AS DATETIME);
```

```
SELECT CAST('2019-09-17' AS DATE) date_field,
```

```
    -CAST('108:17:57' AS TIME) time_field;
```

# Datos

UPDATE rental

SET return\_date =  
STR\_TO\_DATE('September 17, 2019',  
'%M %d, %Y')

WHERE rental\_id = 99999;

SELECT CURRENT\_DATE(),  
CURRENT\_TIME(),  
CURRENT\_TIMESTAMP();

Format component	Description
%M	Month name ( January to December )
%m	Month numeric ( 01 to 12 )
%d	Day numeric ( 01 to 31 )
%j	Day of year ( 001 to 366 )
%W	Weekday name ( Sunday to Saturday )
%Y	Year, four-digit numeric
%y	Year, two-digit numeric
%H	Hour ( 00 to 23 )
%h	Hour ( 01 to 12 )
%i	Minutes ( 00 to 59 )
%s	Seconds ( 00 to 59 )
%f	Microseconds ( 000000 to 999999 )
%p	A.M. or P.M.

# Data manipulation

```
SELECT DATE_ADD(CURRENT_DATE(),  
INTERVAL 5 DAY);  
  
UPDATE rental  
  
SET return_date = DATE_ADD(return_date,  
INTERVAL '3:27:11' HOUR_SECOND)  
  
WHERE rental_id = 99999;  
  
UPDATE employee  
  
SET birth_date = DATE_ADD(birth_date,  
INTERVAL '9-11' YEAR_MONTH)  
  
WHERE emp_id = 4789;
```

Interval name	Description
second	Number of seconds
minute	Number of minutes
hour	Number of hours
day	Number of days
month	Number of months
year	Number of years
minute_second	Number of minutes and seconds, separated by “:”
hour_second	Number of hours, minutes, and seconds, separated by “:”
year_month	Number of years and months, separated by “-”



# Datų manipuliavimas

Paskutinė mėnesio diena

```
SELECT LAST_DAY('2019-09-17');
```

Savaitės diena

```
SELECT DAYNAME('2019-09-18');
```

```
SELECT EXTRACT(YEAR FROM '2019-09-18 22:19:05');
```

```
SELECT DATEDIFF('2019-09-03', '2019-06-21');
```

```
SELECT DATEDIFF('2019-09-03 23:59:59', '2019-06-21 00:00:01');
```

```
SELECT DATEDIFF('2019-06-21', '2019-09-03');
```

# Konvertavimas

```
SELECT CAST('1456328' AS SIGNED INTEGER);
```

```
SELECT CAST('999ABC111' AS UNSIGNED INTEGER);
```

# Užduotys

- Parašykite užklausą, kuri gražina eilutės 'Please find the substring in this string' simbolius nuo 17 iki 25 pozicijos.
- Parašykite užklausą, kuri gražina skaičiaus `-25.76823` ženklą, jo absoliučią reikšmę ir reikšmę suapvalintą iki šimtųjų dalių.
- Parašykite užklausą, kuri gražina šios dienos mėnesio reikšmę.
- Parašykite užklausą, kuri gražintų kūčių ir kalėdų savaitės dienos reikšmę 21 amžiuje.