КУРС «SQL для анализа данных»

МОДУЛЬ 6. Функции для работы с датой и временем — 2

Примеры условий равенства на значения даты и времени

Microsoft SQL Server, MySQL, Postgres

Условия на колонку datetime — с разной точностью:

```
select * from skill_managers where last_transaction_dt = '2020-11-12 19:14:57';

select * from skill_managers where last_transaction_dt = '2020-11-12 19:14:57.000';

select * from skill_managers where last_transaction_dt = '2020-11-12 19:14:57.002';

select * from skill_managers where last_transaction_dt = '2020-11-12 19:14:57.001';
```

Условия на колонку datetime — условия на отдельные части даты и времени:

```
select * from skill_managers where CAST(last_transaction_dt as date) = '2020-01-16';

select * from skill_managers where CAST(last_transaction_dt as time) = '10:26:28';

select * from skill_managers where year(last_transaction_dt) = 2020 and
month(last_transaction_dt)=1;
```

https://dbfiddle.uk/?rdbms=sqlserver_2019&fiddle=0c1c27b67c1297a2b7780069aff099d6&hide=1

Примеры условий неравенства на значения даты и времени

Microsoft SQL Server, MySQL, Postgres

select * from skill_managers where last_transaction_dt > '2020-11-12 19:14:57.000'

select * from skill_managers
where last_transaction_dt >= '2020-11-12 19:14:57.000'

select * from skill_managers
where last_transaction_dt >= '2020-03-06'

select * from skill_managers
where last_transaction_dt >= '2020-03-06' and last_transaction_dt < '2020-03-07'

https://dbfiddle.uk/?rdbms=sqlserver_2019&fiddle=cac53e976dc6f8e7b479e7897acffbe3&hide=1

Компоновка даты и времени

Microsoft SQL Server

```
DATEFROMPARTS ( year, month, day )
DATETIMEFROMPARTS ( year, month, day, hour, minute, seconds, milliseconds )
```

Функции возвращают значение **date** и **datetime** для указанных аргументов.

см. также:
https://docs.microsoft.com/ru-ru/sql/t-sql/functions/datepart-transact-sql?view=sql-server-ver15
https://docs.microsoft.com/ru-ru/sql/t-sql/functions/datetimefromparts-transact-sql?view=sql-server-ver15

Примеры:
select DATEFROMPARTS(2020,11,28)
select DATETIMEFROMPARTS(2020,11,28,13,48,50,0)
select CAST(DATETIMEFROMPARTS(1900,1,1,13,48,50,0) as Time)
select year,month,day,DATEFROMPARTS(year,month,day) dt from skill_operation

https://dbfiddle.uk/?rdbms=sqlserver_2019&fiddle=8a30a741e09fadeb9aae322bb06b9a2f&hide=1

MySQL

```
STR_TO_DATE ( string_to_convert, format_str )
```

Функция возвращает значение **date** и **datetime** для `string_to_convert`, заданной по формату `format_str`

см. также:
https://dev.mysql.com/doc/refman/8.0/en/date-and-time-functions.html#function_str-to-date

Примеры:
select str_to_date(concat(2020,'-',11,'-',28), '%Y-%m-%d')
select str_to_date(concat(2020,11,28), '%Y%m%d')
select str_to_date(concat(2020,'-',11,'-',28,' ',15,':',37), '%Y-%m-%d %H:%i')
select year,month,day, str_to_date(concat(year,'-',month,'-',day), '%Y-%m-%d') dt from skill_operation

https://dbfiddle.uk/?rdbms=mysql_8.0&fiddle=8a5043d161f18f7783202ae7228dd81c&hide=1

Postgres

```
MAKE_DATE ( year, month, day )
MAKE_TIME ( hour, minute, seconds )
MAKE_TIMESTAMP ( year, month, day , hour, minute, seconds )
```

Функции возвращают значение **date, time** и **timestamp** для указанных аргументов.

см. также:
https://www.postgresql.org/docs/9.4/functions-datetime.html

Примеры:
select make_date(2020,11,28)
select make_time(13,48,50)
select make_timestamp(2020,11,28,13,48,50)
select year,month,day,make_date(year,month,day) dt from skill_operation

https://dbfiddle.uk/?rdbms=postgres_12&fiddle=62d2cb5d19f6e895d565a504bcb5cdd2&hide=1

Изменение даты/времени – прибавление/вычитание временных интервалов

Microsoft SQL Server

```
DATEADD (datepart , number , date )
```

Функция добавляет указанное значение number (целое число со знаком) к заданному аргументу datepart входного значения date

datepart	Сокращения
year	yy, yyyy
quarter	qq, q

month	mm, m
dayofyear	dy, y
day	dd, d
week	wk, ww
weekday	dw, w
hour	hh
minute	mi, n
second	ss, s
millisecond	ms
microsecond	mcs
nanosecond	ns

см. также:
https://docs.microsoft.com/ru-ru/sql/t-sql/functions/dateadd-transact-sql?view=sql-server-ver15

Примеры:
select CURRENT_TIMESTAMP, DATEADD(minute,1,CURRENT_TIMESTAMP), DATEADD(hour,1,CURRENT_TIMESTAMP)

select CURRENT_TIMESTAMP, DATEADD(day,10,CURRENT_TIMESTAMP), DATEADD(month,1,CURRENT_TIMESTAMP)

select CURRENT_TIMESTAMP, DATEADD(month,-1,CURRENT_TIMESTAMP)

select * from skill_events where dt_date >= '2020-09-06' and dt_date <= DATEADD(day,10,'2020-09-06')

select * from skill_events where dt_date >= DATEADD(day,-1,'2020-09-06') and dt_date <= DATEADD(day,1,'2020-09-06')

https://dbfiddle.uk/?rdbms=sqlserver_2019&fiddle=f9abff4de91966e9cbfb06efcd003080&hide=1

MySQL.

```
DATE_ADD (date, INTERVAL expr unit )
DATE_SUB (date, INTERVAL expr unit )
```

Функции добавляют/убавляют указанное в `expr` количество к заданному аргументу `unit` входного значения date

unit Value: MICROSECOND, SECOND, MINUTE, HOUR, DAY, WEEK, MONTH, QUARTER, YEAR, SECOND_MICROSECOND, MINUTE_MICROSECOND, MINUTE_SECOND, HOUR_MICROSECOND, HOUR_SECOND, HOUR_MINUTE, DAY_MICROSECOND, DAY_SECOND, DAY_MINUTE, DAY_HOUR, YEAR_MONTH

см. также:
https://dev.mysql.com/doc/refman/8.0/en/date-and-time-functions.html#function_date-add

Примеры:
select CURRENT_TIMESTAMP,DATE_ADD(CURRENT_TIMESTAMP, interval 1 minute),DATE_ADD(CURRENT_TIMESTAMP, interval 1 hour)

select CURRENT_TIMESTAMP,DATE_ADD(CURRENT_TIMESTAMP,interval 10 day),DATE_ADD(CURRENT_TIMESTAMP,interval 1 month)

select CURRENT_TIMESTAMP,DATE_ADD(CURRENT_TIMESTAMP,interval -1 month)

select CURRENT_TIMESTAMP,DATE_SUB(CURRENT_TIMESTAMP,interval 1 month)

select * from skill_events where dt_date >= '2020-09-06' and dt_date <= DATE_ADD('2020-09-06', interval 10 day)

select * from skill_events where dt_date >= DATE_ADD('2020-09-06', interval -1 day) and dt_date <= DATE_ADD('2020-09-06', interval 1 day)

https://dbfiddle.uk/?rdbms=mysql_8.0&fiddle=be52e4580d51699c7140cedbe4a67d65&hide=1

Postgres

Оператор	Пример	Результат
+	date '2001-09-28' + integer '7'	date '2001-10-05'
+	date '2001-09-28' + interval '1 hour'	timestamp '2001-09-28 01:00:00'
+	date '2001-09-28' + time '03:00'	timestamp '2001-09-28 03:00:00'
+	interval '1 day' + interval '1 hour'	interval '1 day 01:00:00'
+	timestamp '2001-09-28 01:00' + interval '23 hours'	timestamp '2001-09-29 00:00:00'
+	time '01:00' + interval '3 hours'	time '04:00:00'
-	- interval '23 hours'	interval '-23:00:00'
-	date '2001-10-01' - date '2001-09-28'	integer '3' (дня)
-	date '2001-10-01' - integer '7'	date '2001-09-24'
-	date '2001-09-28' - interval '1 hour'	timestamp '2001-09-27 23:00:00'
-	time '05:00' - time '03:00'	interval '02:00:00'
-	time '05:00' - interval '2 hours'	time '03:00:00'
-	timestamp '2001-09-28 23:00' - interval '23 hours'	timestamp '2001-09-28 00:00:00'
-	interval '1 day' - interval '1 hour'	interval '1 day -01:00:00'
-	timestamp '2001-09-29 03:00' - timestamp '2001-09-27 12:00'	interval '1 day 15:00:00'
*	900 * interval '1 second'	interval '00:15:00'
*	21 * interval '1 day'	interval '21 days'
*	double precision '3.5' * interval '1 hour'	interval '03:30:00'
/	interval '1 hour' / double precision '1.5'	interval '00:40:00'

см. также:
https://postgrespro.ru/docs/postgresql/9.6/functions-datetime

Примеры:
select CURRENT_TIMESTAMP,CURRENT_TIMESTAMP + interval '1 minute',CURRENT_TIMESTAMP + interval '1 hour'

select CURRENT_TIMESTAMP,CURRENT_TIMESTAMP+interval '10 day',CURRENT_TIMESTAMP+interval '1 month'

select CURRENT_TIMESTAMP,CURRENT_TIMESTAMP - interval '1 month'

select * from skill_events where dt_date >= '2020-09-06'::date and dt_date <= '2020-09-06'::date + interval '10 day'

select * from skill_events where dt_date >= '2020-09-06'::date - interval '1 day' and dt_date <= '2020-09-06'::date + interval '1 day'

https://dbfiddle.uk/?rdbms=postgres_12&fiddle=7227ec3122ecdc6aa55c261373670120&hide=1