

DDL Statements

--" signifies a comment

Defining a primary key

```
ALTER TABLE location ADD CONSTRAINT loc_pk PRIMARY KEY (lid);
```

- automatically defines columns in a primary key as NOT NULL
- max number of chars in constraint name = 63

Defining a foreign key

```
ALTER TABLE location ADD CONSTRAINT location_tz_fk FOREIGN KEY (tzone)
REFERENCES TimeZone(tzone) MATCH FULL;
```

Renaming a Database

```
ALTER DATABASE oldname RENAME TO newname;
```

- user must be owner of the database AND have CREATEUSER privilege

Gotcha

```
"CREATE TABLE tablename ( column_name ..." generates syntax error
```

- extra space not allowed between "(" and "column_name"

Database Level Privileges

if user A creates a db, then user B automatically has access to it

- users A and B must be known to psql through the createuser command

Table Level Privileges

if user A creates a table, users have NO privileges on the table (unless they are granted)
(see Douglas pp741-742)

Date and Time Datatypes

```
SELECT CURRENT_TIMESTAMP generates current time
```

data type TIMESTAMP defaults to TIMESTAMP WITHOUT TIME ZONE

internally, date/times are in UTC

all date and time datatypes have precision of microseconds

DATE value = "08-01" is not valid

- must specify year to create valid DATE field

Date and Time Functions

```
select * from precip where obstime > 'today';
```

- today surrounded by single quotes

```
select * from TextProduct
      where EXTRACT (DAY from CURRENT_TIMESTAMP - postingtime) < 5;
```

To list all records in the Height table which were posted in the last 20 minutes:

```
SELECT * FROM Height WHERE obstime > (now() - interval '20 min');
```

To insert a record containing a NULL DATE value through an INSERT statement:

```
INSERT INTO tablename VALUES(...,NULL,...);
```

In ecpg, recommend using dttoasc only. dttofmasc function exists but does not work properly.

Two more examples:

```
select timestamp '2010-06-26 00:00:00' - timestamp '2008-11-07 00:00:00';
?column?
-----
596 days
(1 row)
```

```
select justify_interval(timestamp '2010-06-26 00:00:00' - timestamp '2008-11-07
00:00:00');
justify_interval
-----
1 year 7 mons 26 days
(1 row)
```

Column Types

INT2
FLOAT4
FLOAT8

FLOAT is the same as FLOAT8

Column Naming

- column names must begin with a letter or underscore
- max of 64 char

JOINS

Postgres has LEFT/RIGHT/FULL OUTER joins available. It uses the ANSI standard format for OUTER join.

- many views in IHFS db contain the keyword OUTER
- Example:

```
CREATE VIEW locview (...
```

```
SELECT ...
FROM location x0 left outer join riverstat x1
ON x0.lid = x1.lid
WHERE ... ;
```

Statement Timing

SET STATEMENT_TIMEOUT TO nn;

- where nn = number of milliseconds
- server run-time configuration parameter
- value of 0 (default) turns off timer
- see Section 16.4.7.1 of PostgreSQL 7.4.7 Documentation

Cursors

EXEC SQL CLOSE statement closes the cursor and frees all resources related to the cursor

Postgres Version 8.3 has "WHERE CURRENT OF ..." clause for cursors. This was available in Informix.

Must close a cursor before reopening it

Checking Query Plans

EXPLAIN SELECT ... ;

EXPLAIN ANALYZE SELECT ...;

If multiple indexes are defined on a table, the optimizer determines which index to use. "A two-column index is bigger and hence more expensive to search than a one-column index --- perhaps quite substantially so ..."

Character Strings

Character strings in SQL statements must be denoted by single quotes (')

Example:

```
psql: SELECT * FROM height WHERE lid = 'ABCD1';
```

To select lids from the Location table which begin with lower case characters:

```
SELECT lid FROM Location WHERE lid SIMILAR TO '[a-z]%' ;
```

To change all characters of a column's values to upper case:

```
UPDATE <tablename> SET <columnname> TO UPPER CASE (<columnname>);
```

To list all Location table identifiers with all lower case characters:

```
SELECT lid FROM Location WHERE lid ~ ('[a-z]');
```

“~” is a POSIX regular expression operator similar to “LIKE” (See Section 9.6.3)

Select records from the HourlyPP table where any char of the hourly_qc field = D
(D signifies the result of a disaggregation)
(note that the hourly_qc field is defined as char (24))

```
SELECT * FROM HourlyPP WHERE hourly_qc ~ ('D');
```

Print only the first X chars of a char column (version 8.3 and later)

```
create table t1 (g char(10));  
insert into t1 values ('abcdefg'),('hijklmno');
```

```
select overlay(g placing ' ' from 3 to 10); -- display only the first 2 chars of column g
```

Temp tables

postgres allows the user to create a temp table with the same name as a real table - the temp table will "mask" the real table during the session - temp table is dropped at the end of the session - idea can be used for testing

Cascading Updates and Deletes

as part of a CREATE TABLE statement, a column can be defined as "ON UPDATE CASCADE" - this will cause updates to "cascade" from parent table to child table - can also be set up for deletes - see Momjian pp161, 162

Granting Superuser Privileges

```
ALTER USER <username> WITH SUPERUSER
```

Locking Tables

postgres has a LOCK statement but has no UNLOCK statement - ending the transaction unlocks the table

Dropping Roles

Execute “REASSIGN OWNED ...” followed by “DROP OWNED...” to remove a role

Must be done for each database

Other Tidbits

Returning only the “first” 10 records of a SELECT:

```
SELECT * FROM ... LIMIT 10;
```

Note that without an “order by” clause, this query is free to return any 10 records. Over the course of time, if additional inserts and deletes are done on the table, the query may return a different set of records.

Returning unique column values

```
SELECT DISTINCT lid FROM CurPP;
```
