

Database creation.

DDL

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- To create a database, you must be a superuser or have the special CREATEDB privilege.

Database creation

```
CREATE DATABASE name
    [ [ WITH ] [ OWNER [=] user_name ]
      [ TEMPLATE [=] template ]
      [ ENCODING [=] encoding ]
      [ LC_COLLATE [=] lc_collate ]
      [ LC_CTYPE [=] lc_ctype ]
      [ TABLESPACE [=] tablespace_name ]
      [ ALLOW_CONNECTIONS [=] allowconn ]
      [ CONNECTION LIMIT [=] connlimit ]
      [ IS_TEMPLATE [=] istemplate ] ]
```

Parameters

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- *user_name* - The role name of the user who will own the new database, or DEFAULT to use the default
- *template* - The name of the template from which to create the new database, or DEFAULT to use the default

Parameters

- *encoding* - Character set encoding to use in the new database

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- *lc_collate* - Collation order to use in the new database
- *lc_ctype* - Character classification to use in the new database

Parameters

- *tablespace_name* - The name of the tablespace that will be associated with the new database

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Parameters

- *tablespace_name* - The name of the tablespace that will be associated with the new database
- *allow_conn* - If false then no one can connect to this database
- *conn_limit* - How many concurrent connections can be made to this database. -1 (the default) means no limit.
- *istemplate* - If true, then this database can be cloned by any user with CREATEDB privileges; if false (the default), then only superusers or the owner of the database can clone it.

Examples

```
CREATE DATABASE lusiadas;
```

```
CREATE DATABASE sales  
  OWNER salesapp  
  TABLESPACE salesspace;
```

Examples

```
CREATE DATABASE music  
    LC_COLLATE 'sv_SE.utf8'  
    LC_CTYPE 'sv_SE.utf8'  
    TEMPLATE template0;
```

```
CREATE DATABASE music2  
    LC_COLLATE 'sv_SE.iso885915'  
    LC_CTYPE 'sv_SE.iso885915'  
    ENCODING LATIN9  
    TEMPLATE template0;
```


TABLESPACE

```
CREATE TABLESPACE tablespace_name  
  [ OWNER { new_owner | CURRENT_USER | SESSION_USER } ]  
  LOCATION 'directory'  
  [ WITH ( tablespace_option = value [, ... ] ) ]
```

Examples

```
CREATE TABLESPACE fastspace  
    LOCATION '/ssd1/postgresql/data';
```

```
CREATE TABLESPACE indexspace  
    OWNER genevieve  
    LOCATION '/data/indexes';
```

Deleting database

- DROP DATABASE -- remove a database

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- It removes the catalog entries for the database and deletes the directory containing the data.
- It can only be executed by the database owner.

Deleting database

```
DROP DATABASE [ IF EXISTS ] name
```

DDL

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- DDL statements create, modify, and remove database objects such as tables, indexes, and users.
- Common DDL statements are CREATE, ALTER, and DROP.

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- The number and order of the columns is fixed, and each column has a name
- The number of rows is variable
- Each column has a data type

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- CREATE TABLE will create a new, initially empty table in the current database.
- The table will be owned by the user issuing the command.

Table creation

```
CREATE TABLE [ IF NOT EXISTS ] table_name ( [
    { column_name data_type [ COLLATE collation ] [ column_constraint [ ... ] ]
      | table_constraint
      | LIKE source_table [ like_option ... ] }
    [, ... ]
] )
[ INHERITS ( parent_table [, ... ] ) ]
[ TABLESPACE tablespace_name ]
```

Parameters

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- *table_name* - The name (optionally schema-qualified) of the table to be created.

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- *table_name* - The name (optionally schema-qualified) of the table to be created.
- *column_name* - The name of a column to be created in the new table.

Parameters

- IF NOT EXISTS - Do not throw an error if a relation with the same name already exists.
- *table_name* - The name (optionally schema-qualified) of the table to be created.
- *column_name* - The name of a column to be created in the new table.
- *data_type* - The data type of the column. This can include array specifiers.

Parameters

- *COLLATE collation - The COLLATE clause assigns a collation to the column (which must be of a collatable data type).*

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- *INHERITS (parent_table [, ...])* - The optional *INHERITS* clause specifies a list of tables from which the new table automatically inherits all columns. Parent tables can be plain tables or foreign tables.

Parameters

- *COLLATE collation* - The *COLLATE* clause assigns a collation to the column (which must be of a collatable data type).
- *INHERITS (parent_table [, ...])* - The optional *INHERITS* clause specifies a list of tables from which the new table automatically inherits all columns. Parent tables can be plain tables or foreign tables.
- *LIKE source_table [like_option ...]* - The *LIKE* clause specifies a table from which the new table automatically copies all column names, their data types, and their not-null constraints.

Parameters

- CONSTRAINT *constraint_name* - An optional name for a column or table constraint.

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- CONSTRAINT *constraint_name* - An optional name for a column or table constraint.
- TABLESPACE *tablespace_name* -The tablespace_name is the name of the tablespace in which the new table is to be created.

Examples

```
CREATE TABLE films (  
    code          char(5) CONSTRAINT firstkey PRIMARY KEY,  
    title         varchar(40) NOT NULL,  
    did           integer NOT NULL,  
    date_prod     date,  
    kind          varchar(10),  
    len           interval hour to minute  
);
```

Examples

```
CREATE TABLE films (  
    code          char(5),  
    title         varchar(40),  
    did           integer,  
    date_prod     date,  
    kind          varchar(10),  
    len           interval hour to minute,  
    CONSTRAINT production UNIQUE(date_prod)  
);
```

Examples

```
CREATE TABLE array_int (  
    vector int[][]  
);|
```

Examples

```
CREATE TABLE distributors (  
    did      integer,  
    name     varchar(40),  
    PRIMARY KEY(did)  
);
```

```
CREATE TABLE distributors (  
    did      integer PRIMARY KEY,  
    name     varchar(40)  
);
```

Default values

```
CREATE TABLE products (  
    product_no integer,  
    name text,  
    price numeric DEFAULT 9.99  
);
```

Modifying tables

- `ALTER TABLE` — change the definition of an existing table

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```
ALTER TABLE [ IF EXISTS ] [ ONLY ] name [ * ]  
    action [, ... ]
```

Parameters

- `ADD COLUMN` - adds a new column to the table, using the same syntax as `CREATE TABLE`

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- DROP COLUMN - drops a column from a table. Indexes and table constraints involving the column will be automatically dropped as well.

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- ADD COLUMN - adds a new column to the table, using the same syntax as CREATE TABLE
- DROP COLUMN - drops a column from a table. Indexes and table constraints involving the column will be automatically dropped as well.
- SET DATA TYPE/TYPE - changes the type of a column of a table.

Parameters

- SET/DROP DEFAULT - These forms set or remove the default value for a column.

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- SET/DROP NOT NULL - These forms change whether a column is marked to allow null values or to reject null values.

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- SET/DROP DEFAULT - These forms set or remove the default value for a column.
- SET/DROP NOT NULL - These forms change whether a column is marked to allow null values or to reject null values.
- *ADD table_constraint* - This form adds a new constraint to a table using the same syntax as CREATE TABLE.

Examples

```
ALTER TABLE distributors  
    ADD COLUMN address varchar(30);
```

```
ALTER TABLE distributors  
    DROP COLUMN address RESTRICT;
```


Examples

```
ALTER TABLE distributors  
  ALTER COLUMN address TYPE varchar(80),  
  ALTER COLUMN name TYPE varchar(100);
```

```
ALTER TABLE distributors  
  ALTER COLUMN address SET DATA TYPE varchar(80),  
  ALTER COLUMN name SET DATA TYPE varchar(100);
```

Deleting tables

`DROP TABLE` — removes tables from the database.

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`DROP TABLE` — removes tables from the database.

Only the table owner, the schema owner, and superuser can drop a table.

Deleting tables

```
DROP TABLE [ IF EXISTS ] name [, ...]  
[ CASCADE | RESTRICT ]
```

Parameters

- CASCADE - Automatically drop objects that depend on the table (such as views), and in turn all objects that depend on those objects

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- RESTRICT - Refuse to drop the table if any objects depend on it. This is the default.

Examples

```
DROP TABLE films, distributors CASCADE;
```

Data types

- PostgreSQL has a rich set of native data types available to users.
- Users can add new types to PostgreSQL using the CREATE TYPE command.

Data types

- Numeric types
- Character types
- Binary Data types
- Date/Time types
- Boolean types
- Arrays

Integer types

- *smallint* (2 bytes) - small-range integer (-32768 to +32767)

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- *integer* (4 bytes) - typical choice for integer (-2147483648 to +2147483647)

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- *smallint* (2 bytes) - small-range integer (-32768 to +32767)
- *integer* (4 bytes) - typical choice for integer (-2147483648 to +2147483647)
- *bigint* (8 bytes) - large-range integer
(-9223372036854775808 to +9223372036854775807)

Floating-Point types

- *real* (4 bytes) - variable-precision, inexact (6 decimal digits precision)

Floating-Point types

- *real* (4 bytes) - variable-precision, inexact (6 decimal digits precision)
- *double* (8 bytes) - variable-precision, inexact (15 decimal digits precision)

Serial types

- *smallserial* (2 bytes) - small autoincrementing integer (1 to 32767)

Serial types

- *smallserial* (2 bytes) - small autoincrementing integer (1 to 32767)
- *serial* (4 bytes) - autoincrementing integer (1 to 2147483647)

Character Types

- *varchar(n)* - variable-length string with limit

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- *varchar(n)* - variable-length string with limit
- *char(n)* - fixed-length string, blank padded

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- *varchar(n)* - variable-length with limit
- *char(n)* - fixed-length, blank padded
- text - variable unlimited length

Binary Data Types

- *bytea* - variable-length binary string (1 or 4 bytes)

Date/Time Types

- *timestamp [(p)] [without time zone]* (8 bytes)- both date and time (no time zone)

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- *timestamp [(p)] with time zone* (8 bytes) - both date and time, with time zone

Date/Time Types

- *timestamp [(p)] [without time zone]* (8 bytes)- both date and time (no time zone)
- *timestamp [(p)] with time zone* (8 bytes) - both date and time, with time zone
- *date* (4 bytes)- date (no time of day)

Date/Time Types

- *time [(p)] [without time zone]* (8 bytes)- time of day (no date)

Date/Time Types

- *time [(p)] [without time zone]* (8 bytes)- time of day (no date)
- *time [(p)] with time zone* (12 bytes) - time of day (no date), with time zone

Date/Time Types

- *time [(p)] [without time zone]* (8 bytes)- time of day (no date)
- *time [(p)] with time zone* (12 bytes) - time of day (no date), with time zone
- *interval [fields] [(p)]* (16 bytes)- time interval

Boolean Types

- *boolean* (1 byte)- state of true or false

Questions?