# goose Database migrations

## CONCEPTS

Set GOOSE_DRIVER, GOOSE_DBSTRING and GOOSE_MIGRATION_DIR (or a .env file) and drop the driver and dbstring from every command.

**create** new .sql file
↓ edit
**Up / Down** SQL annotations
↓ goose up
**Database** goose_db_version
↓ goose status
**Verified** applied list

Each file needs exactly one '-- +goose Up' marker; Down is optional but must come after Up.

## CONNECT

`goose <driver> <dbstring> <command>`
Full invocation form

`goose -dir <path> <command>`
Migration directory (default .)

`export GOOSE_DRIVER=<driver>`
Driver from environment

`export GOOSE_DBSTRING=<dbstring>`
Connection string from environment

`export GOOSE_MIGRATION_DIR=<path>`
Directory from environment

`goose -env <file> <command>`
Load variables from another env file

`goose -table <name> <command>`
Custom version table (schema.table ok)

`goose -timeout <duration> <command>`
Cap query duration, e.g. 1h13m

`goose -v <command>`
Verbose output

`goose -version`
Print goose version

`goose -h`
Help and driver list

## DBSTRING EXAMPLES

**Driver and connection string**

| driver | dbstring |
|---|---|
| sqlite3 | `./app.db` |
| postgres | `"user=postgres dbname=app sslmode=disable"` |
| mysql | `"user:pass@/app?parseTime=true"` |
| mssql | `"sqlserver://user:pass@host:1433?database=app"` |
| clickhouse | `"tcp://127.0.0.1:9000"` |
| redshift | `"postgres://user:pass@host:5439/db"` |

Other drivers: tidb, starrocks, spanner, azuresql, ydb, turso. MySQL needs parseTime=true for status, and multiStatements=true to run several statements per file.

## CREATE

`goose create <name> sql`
New SQL migration

`goose create <name> go`
New Go migration

`goose -s create <name> sql`
Sequential number, not timestamp

`goose -dir <path> create <name> sql`
Create in a given directory

`goose fix`
Renumber timestamps to sequential

`goose validate`
Check files without running them

## SQL ANNOTATIONS

`-- +goose Up`
Start of forward statements

`-- +goose Down`
Start of rollback statements

`-- +goose NO TRANSACTION`
Run outside a transaction (file top)

`-- +goose StatementBegin`
Open a block with inner semicolons

`-- +goose StatementEnd`
Close that block

`-- +goose ENVSUB ON`
Expand ${VAR} in the SQL below

## SQL ANNOTATIONS (cont.)

Every statement must end with a semicolon. Functions and triggers need a StatementBegin/End pair.

## MIGRATE

`goose up`
Apply all pending migrations

`goose up-by-one`
Apply just the next one

`goose up-to <version>`
Migrate up to a version

`goose down`
Roll back the latest one

`goose down-to <version>`
Roll back to a version

`goose redo`
Re-run the latest migration

`goose reset`
Roll back all migrations

`goose -allow-missing up`
Apply out-of-order migrations

## INSPECT

`goose status`
List migrations and applied time

`goose version`
Print current DB version

`goose env`
Print goose environment

## GO MIGRATIONS

`goose.AddMigration(Up, Down)`
Register in init()

`func Up(tx *sql.Tx) error`
Migration function signature

Go migrations need your own goose binary that imports the migrations package; the stock CLI only runs SQL files.

## INSTALL

`go install github.com/pressly/goose/v3/cmd/goose@latest`
Install with Go