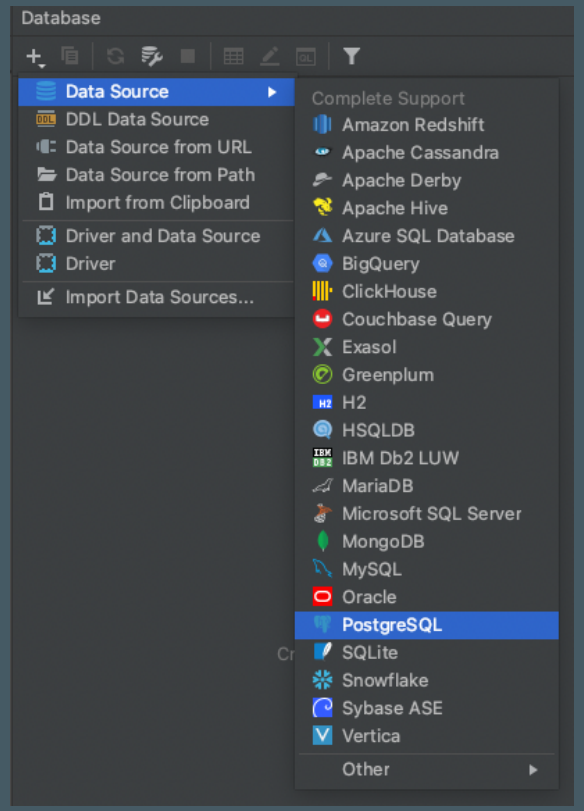
SQL - Structured Query Language

- ANSI Standard since SQL-86
- many dialects and proprietary per vendor
- many versions: SQL-86, SQL-89, SQL-92,... SQL:2016
- Don't panic, there is a common subset which covers 99%

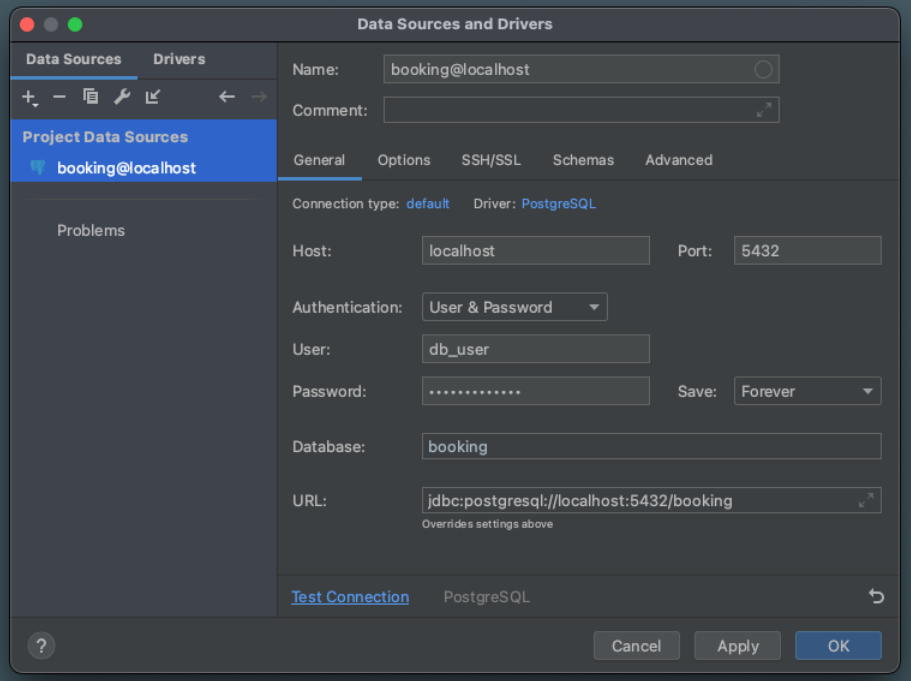
SQL - Structure

- DDL: Data definition language (CREATE, DROP, ALTER, TRUNCATE)
- DQL: Data query language (SELECT)
- DML: Data manipulation language (INSERT, UPDATE)
- DCL: Data control language (GRANT, REVOKE)

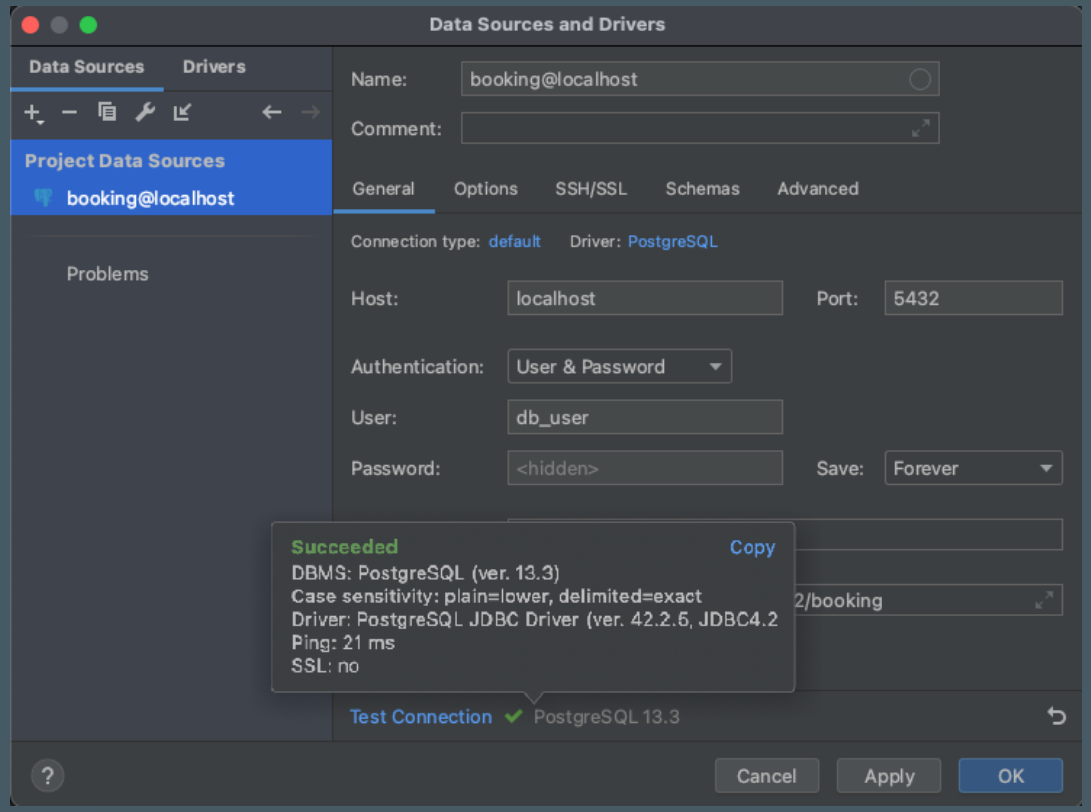
DB Tool - Intellij Idea - Add datasource



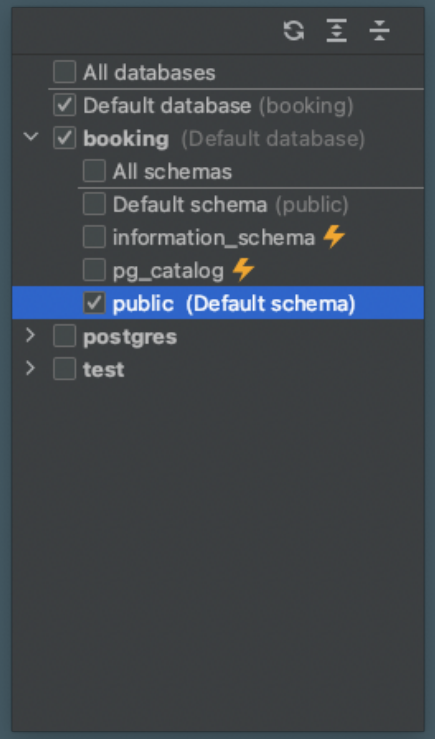
DB Tool - Intellij Idea - Configure connection



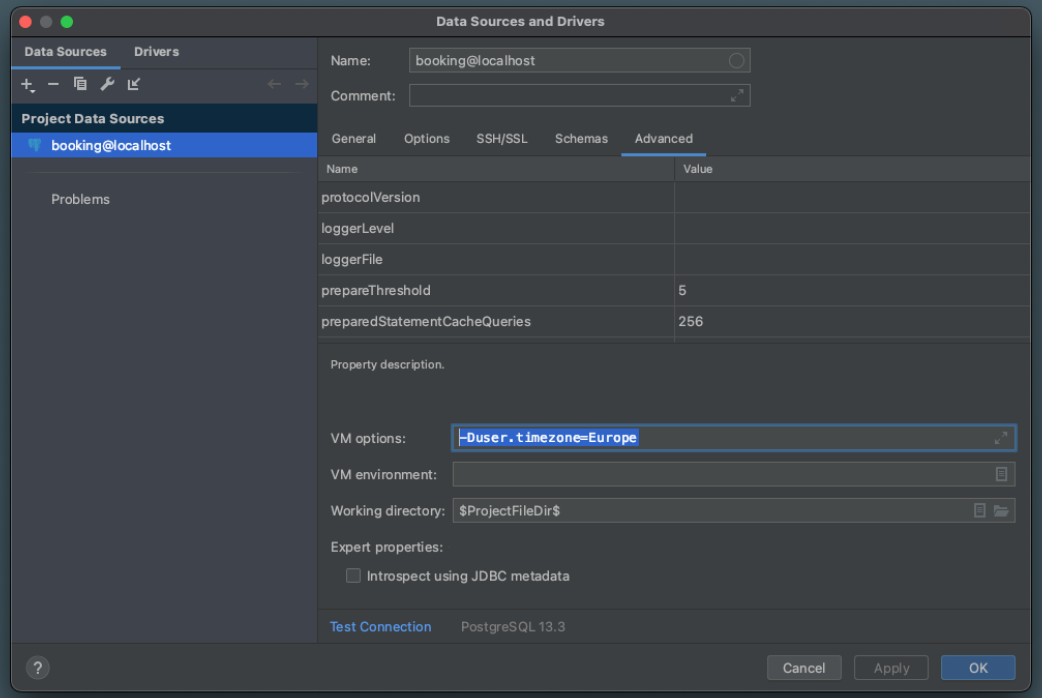
DB Tool - Intellij Idea - Test connection



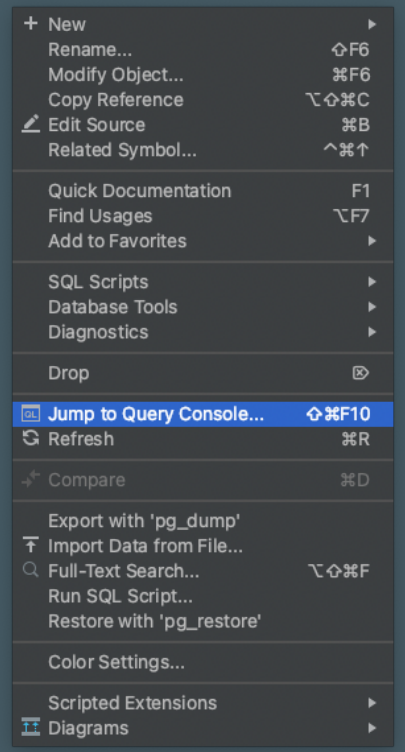
DB Tool - Intellij Idea - Select schema



DB Tool - Intellij Idea - Timezone



DB Tool - Intellij Idea - Open console



Create table

```
CREATE TABLE player
(
  id       BIGINT GENERATED BY DEFAULT AS IDENTITY PRIMARY KEY,
  name     TEXT NOT NULL,
  birthday DATE NOT NULL
);
```

Create table with reference

```
CREATE TABLE booking
(
  id          BIGINT GENERATED BY DEFAULT AS IDENTITY PRIMARY KEY,
  court       INT         NOT NULL,
  player_id   BIGSERIAL NOT NULL REFERENCES player (id),
  start_time TIMESTAMP WITH TIME ZONE,
  end_time    TIMESTAMP WITH TIME ZONE
);
```

PostgreSQL data types

Postgres Data Types

Insert new data

```
INSERT INTO player (id, name, birthday)
VALUES (DEFAULT, 'Sandra', '2002-04-01');

INSERT INTO player (name, birthday)
VALUES ('Peter', '2005-05-01');
```

Bulk insert

```
INSERT INTO player (name, birthday)
VALUES ('Leon', '1990-12-01'),
       ('Paul', '1993-06-01'),
       ('Ben', '2004-09-01'),
       ('Finn', '1988-08-01'),
       ('Felix', '2001-06-01'),
       ('Lina', '2003-03-01'),
       ('Lea', '1996-11-01'),
       ('Clara', '1989-12-01'),
       ('Hanna', '2000-01-01');
```

Query data

```sql
-- select all players born after year 2000
SELECT *
FROM player
WHERE birthday >= '2000-01-01';
```

```sql
-- Select all adults
SELECT *
FROM player
WHERE birthday < NOW() - INTERVAL '18 years';
```

More queries

```sql
SELECT *
FROM player
WHERE birthday < NOW() - INTERVAL '18 years'
AND name ilike 'l%';
```

```sql
SELECT court, p.name, b.start_time from booking b
join player p on p.id = b.player_id
where p.name ilike 'l%';
```

Update existing data

```
UPDATE player
SET birthday = '2005-02-15'
WHERE name = 'Peter';
```

Exercise:

- Add other Peter (yes, same name) with different birthday
- Update Peters birthday to 1st of November 1999
- What's the result?

Delete existing data

```sql
-- good idea: first check what you delete
SELECT *
FROM player
where name = 'Peter';

-- delete players by name
DELETE
FROM player
WHERE name = 'Peter';
```

Constraints - Some examples

```
-- Alternative way of adding constraints later:
ALTER TABLE booking ADD FOREIGN KEY ("player_id") REFERENCES player ("id");

-- prevent duplicates
CREATE UNIQUE INDEX player_name_uidx ON player(name);

-- index used for search
CREATE INDEX player_birthday_idx ON player(birthday);
```