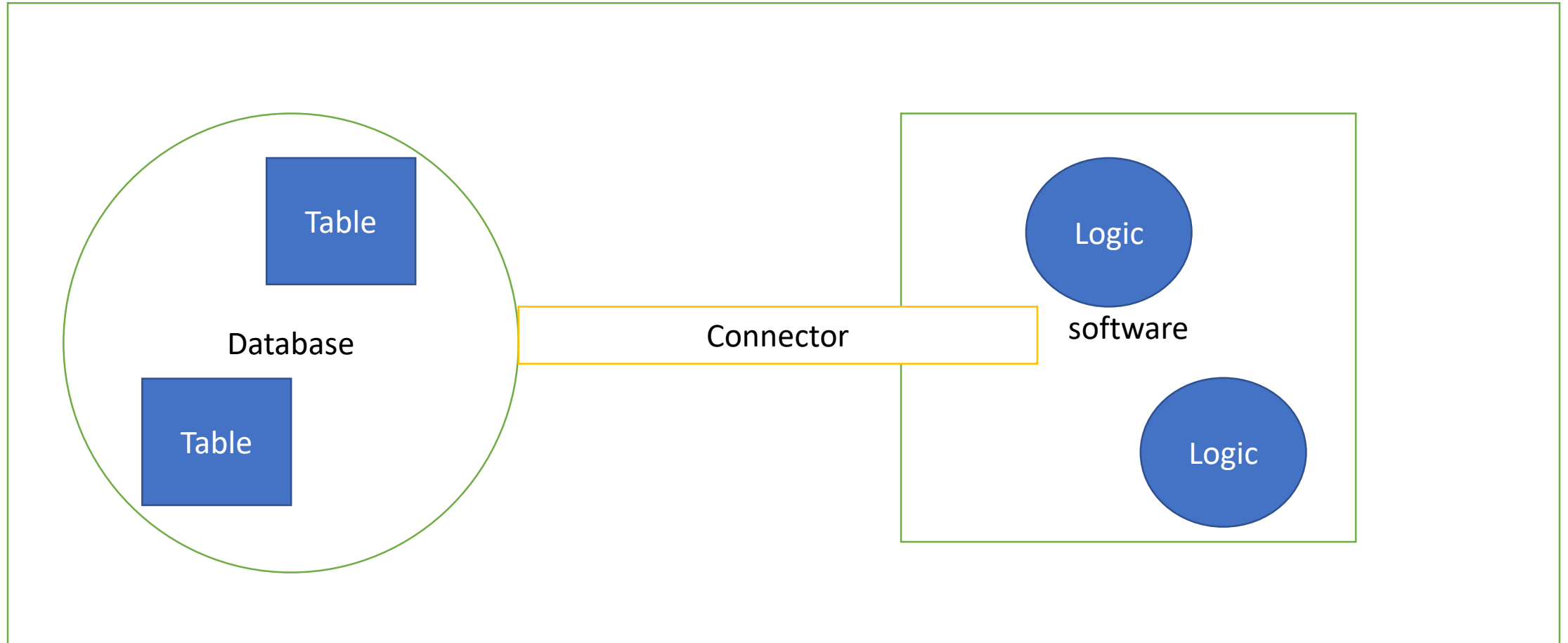


Database

postgresql, db connection & SQL

Databases: data flow



Installing PostgreSQL



Ubuntu:

```
$ sudo apt update
```

```
$ sudo apt install postgresql postgresql-contrib
```

once postgres is installed, we need to work under postgres account

```
$ su - postgres
```

```
postgres@...$
```

Now we can open it

```
$ psql
```

Windows:

<https://www.enterprisedb.com/downloads/postgres-postgresql-downloads>

in the wizard uncheck “stack build”

```
> psql -U postgres -h localhost -W
```

Connector: psycopg2

```
$ pip install psycopg2
```

Connection string

```
$ psql --help
```

connection options:

- h, --host=HOSTNAME database server host or socket directory (default: "local socket")
- p, --port=PORT database server port (default: "5432")
- U, --username=USERNAME database user name (default: "dvirl")
- w, --no-password never prompt for password
- W, --password force password prompt (should happen automatically)

Working with psycopg2

```
import psycopg2
```

```
import logging
```

```
try:
```

```
    conn = psycopg2.connect("dbname='postgres' user='postgres' password='***' host='localhost' port='5432'")
```

```
    cur = conn.cursor()
```

```
    try:
```

```
        cur.execute("""SELECT * FROM test_table""")
```

```
        [print(row) for row in cur.fetchall()]
```

```
    except:
```

```
        logging.error("select failed")
```

```
except:
```

```
    logging.error("connection failed")
```

PSQL

```
postgres=# CREATE DATABASE sample_db;  
postgres=# CREATE TABLE test_table ( x INTEGER);  
postgres=# INSERT INTO test_table (x) VALUES (3);  
postgres=# SELECT * FROM test_table;
```

SQL: SELECT

```
SELECT * FROM my_table
```

```
SELECT name, id, age FROM my_table
```

```
SELECT t.name, t.id FROM my_table AS t
```

```
SELECT * FROM my_table ORDER BY name
```

```
SELECT * FROM my_table ORDER BY name DESC
```

```
SELECT * FROM my_table ORDER BY name LIMIT 3
```

```
SELECT COUNT(id) FROM my_table
```

```
SELECT MAX(age) FROM my_table
```


SQL: WHERE

SELECT name, id WHERE id=1

SELECT name, id WHERE id LIKE "032160111"

SELECT name, id WHERE id LIKE "%3216011%"

SELECT name WHERE id=1

SELECT id WHERE id>6

SELECT id WHERE id IN (1,4,7)

SELECT id WHERE age BETWEEN 30 AND 30

SELECT COUNT(id) FROM my_table WHERE age > 40

SQL: JOIN

```
SELECT t.name FROM my_table AS t  
JOIN his_table AS h  
ON t.id = h.id
```

INNER JOIN, LEFT JOIN, RIGHT JOIN

SQL: AGGREGATION

```
SELECT age FROM my_table
```

```
GROUP BY age
```

(is the same as `SELECT DISTINCT age FROM my_table`)

```
SELECT age, count(id) FROM my_table
```

```
GROUP BY age
```

SQL: WITH

WITH x AS

(

 SELECT age, count(id) AS n_people FROM my_table
 GROUP BY age

)

SELECT n_people FROM x

WHERE age < 30

ORDER BY age DESC

LIMIT 5

SQL: INSERT, UPDATE, DELETE

```
INSERT INTO my_table (id, name)  
VALUES (5, "yossi")
```

```
UPDATE my_table  
SET name = "Yossef", age = 3  
WHERE id = 5  
• dangerous!!!
```

```
DELETE FROM my_table WHERE id=6
```