Bases de Datos Relacionales

SQL Intermedio

SQL Intermedio

- Join (Inner Join)

```
select *
from student, takes
where student.ID= takes.ID;
```

```
select *
from student join takes on student.ID= takes.ID;
```

SQL Intermedio

- Natural Join

```
select *
from student natural join takes;
```

- Left Outer Join

```
select *
from student natural left outer join takes;
```

- Right Outer Join

```
select *
from takes natural right outer join student;
```

SQL Intermedio

- Vistas

```
create view faculty as
select ID, name, dept_name
from instructor;

create view physics_fall_2009 as
    select course.course_id, sec_id, building, room_number
    from course, section
    where course.course_id = section.course_id
                    and course.dept_name = 'Physics'
                    and section.semester = 'Fall'
                    and section.year = '2009';
```
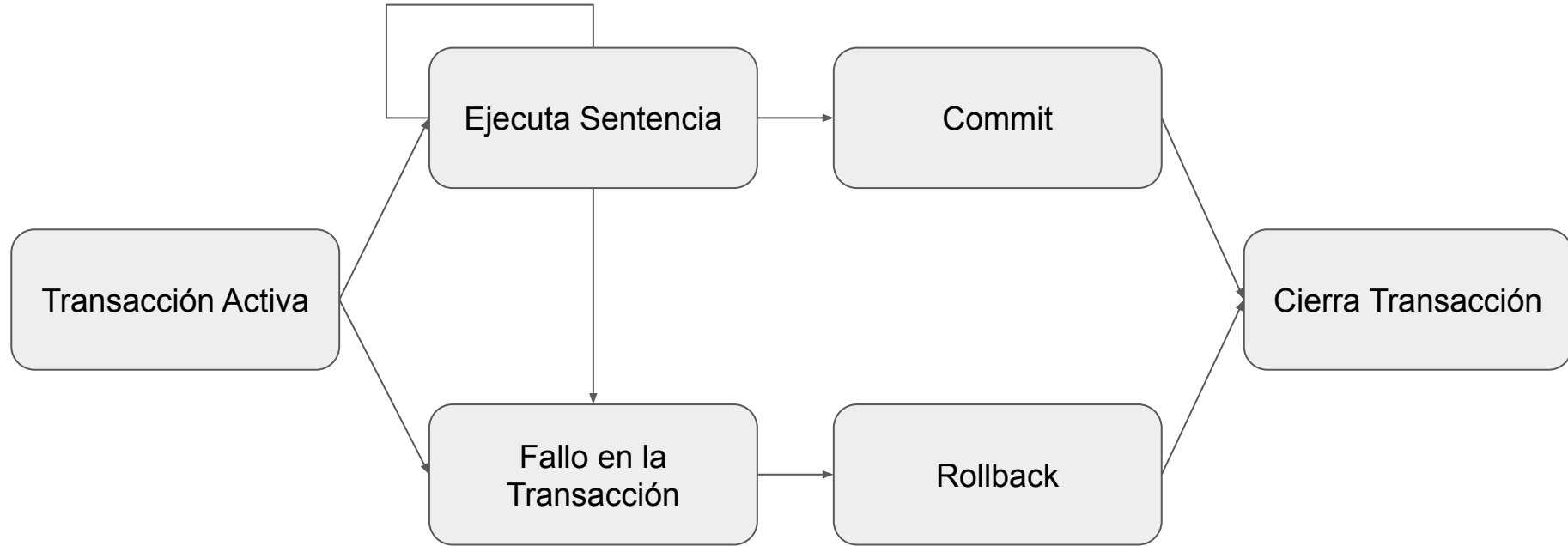
SQL Intermedio

- Vistas
  - Consultas

```
select course_id
from physics_fall_2009
where building= 'Watson';
```

SQL Intermedio

- Transacciones
  - Secuencia de sentencias DML.
  - Una transacción debe finalizar con:
    - Commit
    - Rollback

SQL Intermedio

SQL Intermedio

```python
import psycopg2
try:
    conexion = psycopg2.connect(host="localhost",port="5432",dbname="bd",user="postgres",password="123")
    conexion.autocommit = False
    cursor = conexion.cursor()
    sql = "..."
    cursor.execute(sql)

    sql = "..."

    cursor.execute(sql)

    conexion.commit()
    print("Transaccion exitosa")
except Exception as e:
    print ("Error en la transaccion", e)
    conexion.rollback();
finally:
    cursor.close()
    conexion.close()
    print ("Conexion cerrada")
```

SQL Intermedio

- Restricciones de Integridad
  - Aseguran que los cambios no provoquen pérdida de consistencia
  - Tipos de restricciones
    - En una sola tabla
      - not null
      - unique
      - check

```
create table section
    (course_id      varchar (8),
     sec_id         varchar (8),
     semester       varchar (6),
     year           numeric (4,0),
     building       varchar (15),
     room_number    varchar (7),
     time_slot_id   varchar (4),
     primary key (course_id, sec_id, semester, year),
     check (semester in ('Fall', 'Winter', 'Spring', 'Summer')));
```

SQL Intermedio

- Restricciones de Integridad
  - Integridad referencial
    - Asegura que un valor de un atributo en una tabla aparezca en un atributo de otra tabla
    - Llaves foráneas
  - Violación de integridad durante una transacción
    - Produce excepción que se debe manejar con rollback

SQL Intermedio

- Tipos de datos
  - date
    - yyyy-mm-dd
  - time
    - hh:mm:ss
  - datetime
    - date time
  - timestamp
    - date time
  - default

SQL Intermedio

- Tipos de datos
  - CLOB (Character Large OBject)
    - 10 KB
  - BLOB (Binary Large OBject)
    - Image 10MB
    - Movie 2GB
  - Definición de tipos

```
create type Dollars as numeric(12,2) final;
create table department
    (dept_name      varchar (20),
     building       varchar (15),
     budget         Dollars);
```

SQL Intermedio

- Autorización
  - Autorización para lectura
  - Autorización para inserción
  - Autorización para actualización
  - Autorización para eliminación

grant <privilege list>
on <relation name or view name>
to <user/role list>;

grant select on *department* **to** *Amit, Satoshi;*

grant update (*budget*) **on** *department* **to** *Amit, Satoshi;*

SQL Intermedio

- Autorización

```
revoke <privilege list>
on    <relation name or view name>
from  <user/role list>;
```

```
revoke select on department from Amit, Satoshi;
revoke update (budget) on department from Amit, Satoshi;
```

SQL Intermedio

- Autorización
  - Roles

```
create role instructor;

grant select on takes
to instructor;


grant dean to Amit;
create role dean;
grant instructor to dean;
grant dean to Satoshi;
```