Projeto de BD – Parte 2

Grupo 12

Turno BD2L06

Professores **Pedro Sousa** e **João Caldeira**

Aluno	Esforço (horas)	Esforço Relativo
João Amadeu (98943)	6 horas	33%
Mateus Correia (103557)	6 horas	33%
João Iria (98954)	6 horas	33%

Modelo Relacional:

OBJECTS

customer(<u>cust no</u>, name, email, phone, address)
- unique (email)

order(<u>order no</u>, date)
- IC1: every order must participate in the places association
- IC2: every order must participate in the contains association

sale(<u>order no</u>)
- order no: FK(order)

employee(<u>ssn</u>, TIN, bdate, name)
- unique (TIN)
- IC3: every employee must participate in the works association

department(<u>name</u>)

workplace(<u>address</u>, lat, lon)
- IC4: lat and lon pairs are unique

ofice(<u>address</u>)
- address: FK(Workplace)

warehouse(<u>address</u>)
- address: FK(Workplace)

product(<u>sku</u>, name, description, price)
- IC5: every product must participate in the suply_contract association

EAN product(<u>sku</u>, EAN)
- sku: FK(product)
- IC6: EAN must be unique

suplier(<u>TIN</u>, address, name)
- IC7: every suplier must participate in the suply_contract association

ASSOCIATIONS

pay(<u>order no</u>, cust no)
- Cust no: FK(Customer)
- Order no: FK(Order)

places(<u>order no</u>, cust no)
- Cust no: FK(Customer)
- Order no: FK(Order)

works(<u>ssn</u>, <u>address</u>, <u>name</u>)
- ssn: FK(Employee)
- address: FK(Workplace)
- name: FK(Department)

contains(<u>order no</u>, <u>sku</u>, qty)
- Order no: FK(Order)
- Sku: FK(Product)

suply_contract(<u>sku</u>, <u>TIN</u>, Date)
- Sku: FK(Product)
- TIN: FK(Supplier)

Delivery(<u>address</u>, <u>sku</u>, <u>TIN</u>)
- TIN: FK(Supplier)
- sku: FK(Product)
- address: FK(Warehouse)

Restrictions that can't be represented in a relational model are:
- IC10: Customers can only pay for the Sale of an Order they have placed themselves

Ágebra Relacional:

1) π_name(σ_price>50 AND year(date)=2023 ((Customer ⋈_cust_no=Places.cust_no Places) ⋈_order_no=Contains.order_no (Contains ⋈_sku=Product.sku Product)))

2) π_name((Employee ⋈_ssn=Works.ssn (σ_month(date)=01 AND year(date)=2023 (Works ⋈_address=Warehouse.address Warehouse))) - (Employee ⋈_ssn=Works.ssn Works ⋈_address=Office.address Office))

3) π_name(σ qty=max(qty) (Product ⋈ sku=Contains.sku (γ sku,SUM(qty)→qty Contains)))

4) γ_order_no,SUM(price*qty)->Total_Sale (Sale ⋈_order_no=Contains.order_no ((Product ⋈_sku=Contains.sku Contains) ⋈_order_no=Order.order_no Order))

SQL:

```
1) SELECT DISTINCT c.name
    FROM customer c
            JOIN places pl ON c.cust_no = pl.cust_no
            JOIN "Order" o ON pl.order_no = o.order_no
            JOIN contains cn ON o.order_no = cn.order_no
            JOIN product p ON cn.sku = p.sku
    WHERE p.price > 50
    AND EXTRACT(YEAR FROM o.date) = 2023;



2) SELECT DISTINCT e.name
    FROM employee e
            JOIN works w ON e.ssn = w.ssn
```

```sql
            JOIN workplace wp ON w.address = wp.address

            JOIN warehouse wh ON wh.address = wp.address

            LEFT JOIN office o ON o.address = wp.address

            JOIN process pr ON e.ssn = pr.ssn

            JOIN "Order" ord ON pr.order_no =
    ord.order_no

        WHERE EXTRACT(MONTH FROM ord.date) = 1

          AND EXTRACT(YEAR FROM ord.date) = 2023

          AND o.address IS NULL;
```

3)
```sql
    SELECT p.name

        FROM product p

                JOIN contains cn ON p.sku = cn.sku

        GROUP BY p.name

        ORDER BY SUM(cn.qty) DESC

        LIMIT 1;
```

4)
```sql
    SELECT o.order_no, SUM(p.price * cn.qty) AS
    total_value

    FROM "Order" o

                JOIN contains cn ON o.order_no = cn.order_no

                JOIN product p ON cn.sku = p.sku

        GROUP BY o.order_no

        ORDER BY o.order_no;
```