# Projeto BD - Parte 2

## Grupo 07 – Turno BD2L02

**Professor:**

João Tomás Brazão Caldeira

| Alunos | Número de Aluno | Percentagem Relativa de Contribuição | Esforço Total |
|---|---|---|---|
| André Lazenga | 99052 | 34% | 8h |
| André Correia | 102666 | 33% | 8h |
| Tiago Firmino | 103590 | 33% | 8h |

# CONVERSION TO RELATIONAL MODEL

customer(cust_no, name, email, phone, address)

- UNIQUE(email)

order(order_no, date, cust_no)

- cust_no: FK(customer.cust_no)
- IC-1: Customers can only pay for the Sale of an Order they have placed themselves
- IC-2: Every order (order_no) must participate in the contains association

sale(order_no)

- order_no: FK(order.order_no)

employee(ssn, TIN, bdate, name)

- UNIQUE(TIN)
- IC-3: Every employee (ssn) must participate in the works association

department(name)

workplace(address, lat, long)

- UNIQUE(lat, long)

office(address)

- address: FK(workplace.address)

warehouse(address)

- address: FK(workplace.address)

product(sku, name, description, price)

- IC-4: Every product (sku) must participate in the supplier relation

ean product(sku, ean)

- sku: FK(product.sku)

supplier(TIN, name, address, sku, date)

- sku: FK(product.sku)

pay(cust_no, order_no)

- cust_no: FK(customer.cust_no)
- order_no: FK(sale.order_no)
- IC-1: Customers can only pay for the Sale of an Order they have placed themselves

process(ssn, order_no)

- ssn: FK(employee.ssn)
- order_no: FK(order.order_no)

contains(order_no, sku, qty)

- order_no: FK(order.order_no)
- sku: FK(product.sku)

works(ssn, name, address)

- ssn: FK(employee.ssn)
- name: FK(department.name)
- address: FK(workplace.address)

delivery(sku, TIN, address)

- sku, TIN: FK(supplier.sku, supplier.TIN)
- address: FK(warehouse.address)

# RELATIONAL ALGEBRA

1. List the name of all customers who placed orders containing higher priced products than €50 in the year 2023.

table ← customer ⋈ (order ⋈ (contains ⋈ ($\pi_{sku,\ price}$(product))))

$\pi_{name}\sigma_{(date >= "2023\text{-}01\text{-}01" \wedge date <= "2023\text{-}12\text{-}31") \wedge price > 50}$ (table)

2. List the name of all employees who work in warehouses and not in offices and processed orders in January 2023.

employee_warehouse ← $\pi_{ssn}$(works ⋈ (($\pi_{address}$(works) - office) ∩ warehouse))

employee_jan_2023 ← $\pi_{ssn}\sigma_{(date >= "2023\text{-}01\text{-}01" \wedge date <= "2023\text{-}01\text{-}31")}$ (process ⋈ order)

$\pi_{name}$((employee_warehouse ∩ employee_jan_2023) ⋈ employee)

3. Indicate the name of the bestselling product.

product_sold ← $\pi_{sku,\ qty}$((sale ⋈ contains) ⋈ product)

total_qty_each ← $_{sku}G_{sum(qty) \mapsto total\_qty}$ (product_sold)

$\pi_{name}$($_{name}G_{max(total\_qty)}$(total_qty_each))

4. Indicate the total value of each sale made.

product_sold ← $\pi_{name,\ qty}$((sale ⋈ contains) ⋈ product)

sale_value ← $\pi_{order\_no,\ qty*price \mapsto total\_each\_product}$(product_sold)

$_{order\_no}G_{sum(total\_each\_product) \mapsto total}$(sale_value)