

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%	10h
André Correia	102666	33%	10h
Tiago Firmino	103590	33%	10h

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.

$\text{table} \leftarrow \text{customer} \bowtie (\text{order} \bowtie (\text{contains} \bowtie (\Pi_{\text{sku}, \text{price}}(\text{product}))))$

$\Pi_{\text{name}} \sigma_{(\text{date} \geq \text{"2023-01-01"} \wedge \text{date} \leq \text{"2023-12-31"}) \wedge \text{price} > 50} (\text{table})$

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

$\text{employee_warehouse} \leftarrow \Pi_{\text{ssn}}(\text{works} \bowtie ((\Pi_{\text{address}}(\text{works}) - \text{office}) \cap \text{warehouse}))$

$\text{employee_jan_2023} \leftarrow \Pi_{\text{ssn}} \sigma_{(\text{date} \geq \text{"2023-01-01"} \wedge \text{date} \leq \text{"2023-01-31"})} (\text{process} \bowtie \text{order})$

$\Pi_{\text{name}}((\text{employee_warehouse} \cap \text{employee_jan_2023}) \bowtie \text{employee})$

3. Indicate the name of the bestselling product.

$\text{product_sold} \leftarrow \text{sale} \bowtie \text{contains}$

$\text{total_qty_each} \leftarrow \text{sku} \text{Gsum}(\text{qty}) \mapsto \text{total_qty}(\text{product_sold})$

$\Pi_{\text{name}}((\text{Gmax}(\text{total_qty}) \mapsto \text{total_qty}(\text{total_qty_each}) \bowtie \text{total_qty_each}) \bowtie \text{product})$

4. Indicate the total value of each sale made.

$\text{product_sold} \leftarrow (\text{sale} \bowtie \text{contains}) \bowtie \text{product}$

$\text{sale_value} \leftarrow \Pi_{\text{order_no}, \text{qty} * \text{price}} \mapsto \text{total_each_product}(\text{product_sold})$

$\text{order_no} \text{Gsum}(\text{total_each_product}) \mapsto \text{total}(\text{sale_value})$