Projeto BD - Parte 2

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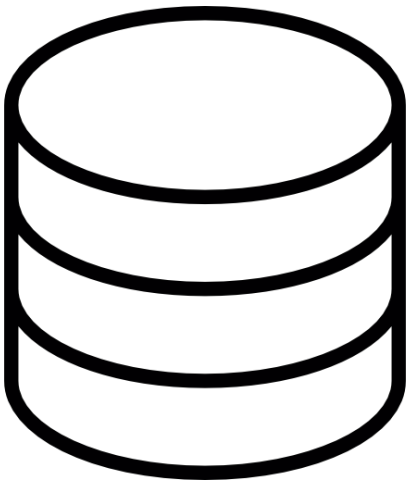

Turno Laboratorial: L03

Professor Responsável pelo Laboratório: Pedro Leão Dias

Número do Grupo: 09

Percentagem Relativa de Contribuição de cada aluno:
-> Francisco Gouveia = 34%
-> Rui Amaral = 33%
-> Pedro Freitas = 33%

Esforço Total (em horas) de cada aluno:
-> Francisco Gouveia = 15h
-> Rui Amaral = 15h
-> Pedro Freitas = 15h

Modelo Relacional:

department(name)

employee(ssn, TIN, bdate, name)
- UNIQUE(TIN)
- RI-4: Every employee(ssn) must participate in the *works* association

workplace(address, lat, long)
- UNIQUE(lat, long)
- (-90<= lat <= 90): Latitude must be between -90 and 90
- (-180<= long <= 180): Longitude must be between -180 and 180

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

office(address)
- address: FK(workplace.address)

warehouse(address)
- address: FK(workplace.address)

supplier(name, address, TIN, sku, date)
- sku: FK(product.sku)

product(sku, name, description, price)
- RI-5: Every product(sku) must participate in the *supplier* association
- (price >= 0): Price must always be non-negative

delivery(address, TIN)
- TIN: FK(supplier.TIN)

ean_product(sku, ean)

- sku: FK(product.sku)

orders(order_no, date, customer_no)

- cust_no: FK(customer.customer_no)
- RI-6: every order(order_no) must participate in the *contains* association

processes(ssn, order_no)

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

contains(order_no, sku, qty)

- order_no: FK(orders.order_no)
- sku: FK(product.sku)
- (qty > 0): Quantity must always be greater than 0.

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

- UNIQUE(email)

sale(order_no)

- order_no: FK(orders.order_no)

pay(order_no, customer_no)

- order_no: FK(sale.order_no)
- customer_no: FK(customer.cust_no)

Álgebra Relacional

1. Liste o nome de todos os clientes que fizeram encomendas contendo produtos de preço superior a €50 no ano de 2023:

prod ⟵ $\rho_{\text{name}\to\text{prod\_name}}\ \sigma_{\texttt{price>50}}$(contains ⋈ product)

ord ⟵ $\sigma_{\texttt{date>='2023-01-01'}\ \wedge\ \texttt{date<='2023-12-31'}}$ (prod ⋈ order)

$\pi_{\texttt{name}}$(customer ⋈ ord)

2. Liste o nome de todos os empregados que trabalham em armazéns e não em escritórios e processaram encomendas em Janeiro de 2023:

ware_only ⟵ $\pi_{\texttt{ssn}}$(works ⋈ warehouse) - $\pi_{\texttt{ssn}}$(works ⋈ office)

emps ⟵ $\sigma_{\texttt{date>='2023-01-01'}\ \wedge\ \texttt{date<='2023-01-31'}}$(ware_only ⋈ process ⋈ order ⋈ employee)

$\pi_{\texttt{name}}$(emps)

3. Indique o nome do produto mais vendido:

totals ⟵ $_{\texttt{sku}}\mathcal{G}_{\texttt{SUM(qty)}\to\texttt{total}}$(contains ⋈ product)

$\pi_{\texttt{name}}$(totals ⋈ $\mathcal{G}_{\texttt{MAX(total)}}$(totals) ⋈ product)

4. Indique o valor total de cada venda realizada:

vol ⟵ $\pi_{\texttt{order\_no,price*qty}\to\texttt{volume}}$(contains ⋈ product ⋈ sale)

$_{\texttt{order\_no}}\mathcal{G}_{\texttt{SUM(volume)}}$(vol)