Projeto BD - Parte 2

Grupo 002 — Turno L13 — LEIC-A

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Modelo Relacional

customer(<u>cust_no</u>, name, email, phone, address)
- UNIQUE(email)

package(<u>package_no</u>, date, cust_no)
- cust_no: FK(customer) NOT NULL
- **(IC-6)** any package_no in package must exist in contains

sale(<u>package_no</u>)
- package_no: FK(package)

pay(<u>package_no</u>, cust_no)
- package_no: FK(sale)
- cust_no: FK(customer) NOT NULL
- **(IC-1)** cust_no must exist in the package identified by package_no

product(<u>sku</u>, name, description, price)
- **(IC-7)** any sku in product must exist in supplier
- **(IC-8)** when a product is removed from the database it must also be removed from ean_product if present

ean_product(<u>sku</u>, ean)
- sku: FK(product)

contains(<u>package_no</u>,<u>sku</u>, qty)
- package_no: FK(package)
- sku: FK(product)

supplier(<u>tin</u>, name, address, sku, supply_contract_date)
- sku: FK(product)

department(<u>name</u>)

workplace(<u>address</u>, lat, long)
- UNIQUE(lat, long)
- **(IC-9)** when a workplace is removed from the database it must also be removed from warehouse and_or office if present

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

delivery(<u>address</u>, <u>tin</u>)
- address: FK(warehouse)
- tin: FK(supplier)

office(<u>address</u>)
- address: FK(workplace)

employee(<u>ssn</u>, tin, b_date, name)
- UNIQUE(tin)
- **(IC-10)** any ssn in employee must exist in works

works(<u>ssn</u>, <u>name</u>, <u>address</u>)
- ssn: FK(employee)
- name: FK(department)
- address: FK(workplace)

process(<u>ssn</u>, <u>package_no</u>)
- ssn: FK(employee)
- package_no: FK(package)

Álgebra Relacional e SQL

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

$$c \leftarrow \sigma_{\text{date}\geq'2023/01/01' \ \wedge \ \text{date}\leq'2023/12/31'}(\text{costumer} \bowtie \text{package}) \bowtie \text{contains}$$

$$\pi_{\text{costumer.name}}(\sigma_{\text{price}>50}(c \bowtie_{\text{contains.sku = product.sku}} \text{product}))$$

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

$$e \leftarrow \sigma_{\text{date}\geq'2023/01/01' \ \wedge \ \text{date}\leq'2023/01/31'}(\text{employee} \bowtie \text{process} \bowtie \text{package}) \bowtie_{\text{employee.ssn = works.ssn}} \text{works}$$

$$\pi_{\text{employee.name}}((e \bowtie \text{warehouse}) - (e \bowtie \text{office}))$$

3. Indique o nome do produto mais vendido.

$$p \leftarrow_{\text{sku}} G_{\text{sum(qty)}\mapsto\text{p\_qty}}(\text{product} \bowtie \text{contains} \bowtie \text{sale})$$

$$\pi_{\text{name}}(G_{\text{max(p\_qty)}\mapsto\text{p\_qty}}(p) \bowtie p \bowtie \text{product})$$

4. Indique o nome do produto mais vendido.

$$_{\text{package\_no}}G_{\text{sum(price * qty)}\mapsto\text{total\_val}}(\pi_{\text{package\_no, sku, price * qty}}(\text{sale} \bowtie \text{contains} \bowtie \text{product}))$$