Projeto BD - Parte 1

Nome do Aluno	Número do Aluno	Contribuição (%)	Esforço (horas)
Martim Mendes	102932	30%	18
Lourenço Matos	103432	40%	20
João Correia	103544	30%	18

Número do Grupo: 11
Turno: BD2L03
Nome do Professor do Laboratório: Pedro Miguel Leão Veloso Dias

1. Modelo Relacional

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

Order(<u>order_no</u>, date, cust_no)
- cust_no: FK(Customer.cust_no)
- IC-1: Every order(order_no) must participate in the contains relation.

Sale(<u>order_no</u>)
- order_no: FK(Order.order_no)

pay(<u>cust_no</u>, <u>order_no</u>)
- cust_no: FK(Customer.cust_no)
- order_no: FK(Sale.order_no)

Department(<u>name</u>)

Employee(<u>ssn</u>, TIN, bdate, name)
- UNIQUE(TIN)
- IC-2: Every employee (ssn) must participate in the works relation.

process(<u>ssn</u>, <u>order_no</u>)
- ssn: FK(Employee.ssn)
- order_no: FK(Order.order_no)

Workplace(<u>address</u>, lat, long)
- UNIQUE(lat, long)

Office(<u>address</u>)
- address: FK(Workplace.address)

Warehouse(<u>address</u>)
- address: FK(Workplace.address)

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

Product(sku, name, description, price)
- IC-3: Every product (sku) must be related to a Supplier.

EAN_Product(sku, ean)
- sku: FK(Product.sku)

contains(order_no, sku, qty)
- order_no: FK(Order.order_no)
- sku: FK(Product.sku)

Supplier(TIN, name, address, sku, date)
- sku: FK(Product.sku)

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

Restrições de Integridade não passíveis de conversão:

- (IC-1) Customers can only pay for the sale of an Order they have placed themselves

2. Álgebra Relacional

1. $\pi_{\text{name}}(\sigma_{\text{price}>50 \wedge \text{date}=\text{'\%/\%/2023'}}(\text{Customer} \bowtie (\text{Order} \bowtie (\text{Contains} \bowtie \rho_{\text{name}\rightarrow\text{prodname}}(\text{Product}))))$

2. $\text{employees\_work} \leftarrow \rho_{\text{name}\rightarrow\text{dep\_name}}((\text{Warehouse} - \text{Office}) \bowtie \text{Works})$
   $\pi_{\text{name}}(\sigma_{\text{date}=\text{'\%/01/2023'}}(\text{Employee} \bowtie ((\text{Process} \bowtie \text{Order}) \bowtie \text{employees\_work})))$

3. $\text{totalvendas} \leftarrow_{\text{sku}} G_{\text{SUM(qty)}} \rightarrow \text{total}((\text{Contains} \bowtie \text{Product}) \bowtie \text{Sale})$
   $\pi_{\text{name}}((\text{totalvendas} \bowtie \text{Product}) \bowtie G_{\text{MAX(total)}}(\text{totalvendas}))$

4. $_{\text{order\_no}}G_{\text{order\_no,SUM(total)}}(\pi_{\text{order\_no, sku, (price*qty)}\rightarrow\text{total}}(\text{Sale} \bowtie (\text{Contains} \bowtie \text{Product})))$