

Projeto BD - Parte 2

Nome	Número	Percentagem de esforço (%)	Horas totais de esforço (H)
Bernardo Sousa	103191	33.(3)	8
Miguel Sol	102710	33.(3)	8
Mariana Carvalho	102956	33.(3)	8

Grupo: 31

Turno: BD2L02

Professor: João Caldeira

Projeto de BD - Parte 2

Modelo Relational

Department(name)

Workplace(address, lat, long)

- UNIQUE(lat, long)
- $(-90 \leq \text{lat} \leq 90)$: lat must always be in the interval of -90 and 90
- $(-180 \leq \text{long} \leq 180)$: long must always be in the interval of -180 and 180

Office(address)

- address: FK(Workplace.address)

Warehouse(address)

- address: FK(Workplace.address)

Employee(ssn, TIN, bdate, name)

- UNIQUE(TIN)
- IC-1: Every Employee (ssn) must participate in the "works" association

works(address, ssn, name)

- address: FK(Workplace)
- ssn: FK(Employee)
- name: FK(Department)

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

- UNIQUE(email)

Order(order_no, date, cust_no)

- cust_no: FK(Customer)
- IC-2: Every Order (order_no) must participate in the "contains" association

process(ssn, order_no)

- ssn: FK(Employee)
- order_no: FK(Order)

Sale(order_no)

- order_no: FK(Order.order_no)

pay(cust_no, order_no)

- cust_no: FK(Customer)
- order_no: FK(Sale)
- IC-3: The pair (cust_no, order_no) must exist in Order

Product(sku, name, description, price)

- IC-4: Every Product (sku) must exist in a Supplier

contains(order_no, sku, qty)

- order_no: FK(Order)
- sku: FK(Product)

EAN_Product(sku, ean)

- sku: FK(Product.sku)

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

- sku: FK(Product)

delivery(TIN, address)

- TIN: FK(Supplier)
- address: FK(Warehouse)

Algebra Relational

1 -

$R : \pi_{product_name} [\sigma_{price > 50 \wedge 1/1/2023 \leq date \leq 31/12/2023} (Customer \bowtie Order \bowtie contains \bowtie \rho_{name \rightarrow product_name}(Product))]$

2 -

$works_in_warehouse \leftarrow \pi_{employee_name} [\rho_{name \rightarrow employee_name}(Employee) \bowtie works \bowtie Workplace \bowtie Warehouse]$

$works_in_office \leftarrow \pi_{employee_name} [\rho_{name \rightarrow employee_name}(Employee) \bowtie works \bowtie Workplace \bowtie Office]$

$only_works_in_warehouse \leftarrow work_in_warehouse - works_in_office$

$process_in_jan2023 \leftarrow \pi_{name} [\sigma_{1/1/2023 \leq date \leq 31/12/2023} (Employee \bowtie process \bowtie Order)]$

$R : only_works_in_warehouse \cap \rho_{name \rightarrow employee_name}(process_in_jan2023)$

3-

$grouped_qty_by_sku \leftarrow_{sku} G_{sum(qty)}(Sale \bowtie contains \bowtie Product)$

$R : \pi_{name} [\sigma_{qty = G_{max(qty)}(grouped_qty_by_sku)} (grouped_qty_by_sku \bowtie Product)]$

4-

$R : \pi_{order_number} G_{sum(qty*price)}(Sale \bowtie contains \bowtie Product)$