Projeto BD - Parte 2

Grupo: 202
Professor: Miguel Garção Silva
Laboratório: L08

Percentagem relativa de contribuição
e
Esforço total de cada membro do grupo

Nome e número do aluno	%Relativa de Contribuição	Esforço Total (horas)
Francisco Guilherme 99069	25%	4
Henrique Anjos 99081	20%	4
Tiago Caldas 99125	30%	6
Vasco Vaz 99133	25%	4

Modelo Relacional

Point_of_retail(address, name)

IVM(serial_number, manuf)

installed-at(address, serial_number, manuf, nr)
- address: FK(Point_of_Retail)
- serial_number, manuf: FK(IVM)

Retailer(TIN, name)
- unique(name)

Category(name)
- IC-1: No Category can exist at the same time in 'Simple Category' and in 'Super Category'
- IC-2: name must exist in 'Simple Category' and/or 'Super Category'

Simple_category(name)
- name: FK(Category)

Super_category(name)
- name: FK(Category)
- IC-3: Every Super Category must participate in the has-other association

responsible-for(TIN, name, serial_number, manuf)
- TIN: FK(Retailer)
- name: FK(Category)
- serial_number, manuf: FK(IVM)

has-other(super_category_name, category_name)
- super_category_name: FK(Super_category.name)
- category_name: FK(Category.name)
- IC-4: Uma categoria não pode estar contida em si própria
- IC-5: Não podem existir ciclos nas hierarquias de Categorias

Product(ean, descr)
- IC-6: Every Product must participate in the has association

has(ean, name)
- ean: FK(Product)
- name: FK(Category)

Shelve(serial_number, manuf, nr, name, height)
- serial_number, manuf: FK(IVM)
- name: FK(Category)
- IC-7: No Shelve can exist at the same time in 'Ambient Temp Shelf', in 'Warm Shelf' and in 'Cold Shelf'
- IC-8: serial_number, manuf, nr must exist in 'Ambient Temp Shelf' or/in 'Warm Shelf' or/in 'Cold Shelf'

Ambient_temp_shelf(<u>serial_number, manuf, nr</u>)

- serial_number, manuf, nr: FK(Shelve)

Warm_shelf(<u>serial_number, manuf, nr</u>)

- serial_number, manuf, nr: FK(Shelve)

Cold_shelf(<u>serial_number, manuf, nr</u>)

- serial_number, manuf, nr: FK(Shelve)

planogram(<u>ean, serial_number, manuf, nr</u>, faces, max_units, loc)

- ean: FK(Product)
- serial_number, manuf, nr: FK(Shelf)

Replenishment_event(<u>ean, serial_number, manuf, nr, instant</u>, TIN, units)

- ean, serial_number, manuf, nr: FK(planogram)
- TIN: FK(Retailer)
- IC-9: units ≤ max_units
- IC-10: Um produto só pode ser reposto numa Prateleira onde a sua Categoria seja apresentada
- IC-11: Um produto só pode ser reposto pelo Retalhista responsável pela Categoria do Produto

Álgebra Relacional

1)

$$\pi_{ean,\ descr}\ \sigma_{name = \text{"Barras } Energéticas\text{"} \ AND \ instant > \text{"2021/12/31"} \ AND \ units > 10}\ (\rho_r\ replentishment\_event \bowtie \rho_p\ product \bowtie \rho_h\ has \bowtie \rho_c\ category)$$

2)

$$\pi_{serial\_number}\ (\sigma_{ean = \text{"9002490100070"}}\ (\rho_i\ ivm \bowtie \rho_p\ planogram))$$

3)

$$G_{count(\ ) \rightarrow \text{número\_subcategorias}}(\sigma_{super\_category\_name = \text{'Sopas Take Away'}}(\rho_{sc}\ super\_category \bowtie \rho_{ho}\ has\_other) \bowtie \rho_c\ category)$$

4)

$$\pi_{ean,\ descr}\ (\sigma_{units = max\_units}\ (replentishment\_event \times G_{max(units) \rightarrow max\_units}\ (\rho_r\ replentishment\_event \bowtie \rho_p\ product))$$

SQL

1)
```
SELECT ean, descr
FROM product p NATURAL JOIN replentishment_event r
        NATURAL JOIN has
        NATURAL JOIN category c
WHERE c.name = 'Barras Energéticas'
        AND r.instant > '2021/12/31'
        AND r.units > 10;
```

2)
```
SELECT serial_number
FROM ivm i NATURAL JOIN planogram p
WHERE p.product_EAN = '9002490100070';
```

3)
```
SELECT COUNT(super_category_name)
FROM has_other
WHERE super_category_name = 'Sopas Take-Away';
```

4)
```
SELECT ean, descr
FROM product p NATURAL JOIN replentishment_event r
GROUP BY ean
HAVING COUNT(ean) >= ALL (
        SELECT COUNT(ean)
        FROM product p2 NATURAL JOIN replentishment_event r2
        GROUP BY ean);
```