TÉCNICO LISBOA

Ano Letivo 2021/2022

Projeto BD – Parte 2

Professora Daniela Machado

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Nome	**Número de aluno**	Contribuição relativa	Esforço total (horas)
Martim Santos	95638	33.3%	6
Diogo Adegas	96854	33.3%	6
Tomás Nunes	96915	33.3%	6

Grupo 149 – Turno L15

Modelo Relacional e Restrições de Integridade

Point of Retail (name, address)

IVM (serial number, manuf)

Product (ean, descr)
- (RI-7) Every Product (ean) must participate in the *has* association.

Shelve (serial number, manuf, nr, height, name)
- serial number, manuf : FK (IVM.serial_number, IVM.manuf)
- name : FK (Category)
- (RI-8) One Shelve can only have one of the following types: Ambient Temp Shelf, Warm Shelf or Cold Shelf.
- (RI-9) *nr* must exist in Ambient Temp Shelf, Warm Shelf or Cold Shelf.
- (RI-5) A Product can only be replenished on a Shelf where its Category (*name*) is displayed.

Ambient Temp Shelf (serial number, manuf, nr)
- serial number, manuf, nr : FK (Shelve.serial_number, Shelve.manuf, Shelve.nr)

Warm Shelf (serial number, manuf, nr)
- serial number, manuf, nr : FK (Shelve.serial_number, Shelve.manuf, Shelve.nr)

Cold Shelf (serial number, manuf, nr)
- serial number, manuf, nr : FK (Shelve.serial_number, Shelve.manuf, Shelve.nr)

Retailer (TIN, name)
- unique (name)

Replenishment event (serial number, manuf, nr, ean, instant, units, TIN)
- serial number, manuf, nr, ean : FK (planogram.serial_number, planogram.manuf, planogram.nr, planogram.ean)
- TIN : FK (Retailer)
- (RI-4) *units* cannot exceed the number of *units* specified in the planogram
- (RI-5) A Product can only be replenished on a Shelf where its Category (*name*) is displayed.
- (RI-6) A Product can only be replaced by the Retailer responsible for the Product Category.

Category (name)

- (RI-1) One Category cannot be contained in itself.
- (RI-2) Cycles should not exist in Category hierarchies
- (RI-10) *name* must exist in Simple Category and Super Category

Simple Category (name)

- name : FK (Category)

Super Category (name)

- name : FK (Category)
- (RI-11) Every Super Category must participate in the *has-other* association.

installed-at (address, serial number, manuf, nr)

- address : FK (Point of Retail)
- serial number, manuf : FK (IVM.serial_number, IVM.manuf)

planogram (ean, serial number, manuf, nr, faces, units, loc)

- ean : FK (Product)
- serial number, manuf, nr : FK (Shelve.serial_number, Shelve.manuf, Shelve.nr)
- (RI-4) *units* cannot exceed the number of *units* specified in the planogram

has (ean, name)

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

responsible-for (TIN, serial number, manuf, name)

- TIN : FK (Retailer)
- serial number, manuf : FK (IVM.serial_number, IVM.manuf)
- name : FK (Category)

has-other (super_categ_id, categ_id)

- super_categ_id : FK (Super Category)
- categ_id : FK (Category)

Álgebra Relacional

1. $\pi_{ean,descr}(\sigma_{name=\text{"Barras Energéticas"} \wedge units>10 \wedge instant>\text{"2021/12/31"}}(Product \bowtie has \bowtie Replenishment\ Event))$

2. $\pi_{serial\ number}(\sigma_{ean=\text{"9002490100070"}}(Product \bowtie has \bowtie Shelve))$

3. $\pi_{nr\_sub\_categs}\left(\sigma_{super\_categ\_id=\text{"Sopas Take-Away"}}\left({}_{super\_categ\_id}G_{count()\rightarrow nr\_sub\_categs}(has\text{-}other)\right)\right)$

4. $T \leftarrow {}_{ean,descr}G_{sum(units)\rightarrow tot_{units}}(Product \bowtie Replenishment\ Event)$
   $\pi_{ean,descr}(T \bowtie G_{max(tot\_units)}(T))$

SQL

1. **SELECT** ean, descr
   FROM product **NATURAL JOIN** has **NATURAL JOIN** replenishment_event
   WHERE name= 'Barras Energéticas' **AND** units > 10 **AND** instant > '2021/12/31';

2. **SELECT** serial_number
   FROM product **NATURAL JOIN** has **NATURAL JOIN** shelve
   WHERE ean = '9002490100070';

3. **SELECT** nr_sub_categs
   FROM (
   SELECT super_categ_id, **COUNT**(*) **AS** nr_sub_categs
   FROM has-other
   GROUP BY super_categ_id **)** as x
   WHERE super_categ_id = 'Sopas Take-Away';

4. **SELECT** ean, descr
   FROM product **NATURAL JOIN** replenishment_event
   GROUP BY ean
   HAVING SUM(units) >= **ALL** (
   SELECT SUM(units)
   FROM replenishment_event
   GROUP BY ean);