Instituto Superior Técnico

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Projeto de BD - Parte 2

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Grupo nº 93, turno B2L09

Nome, número e aproveitamento:

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Modelo Relacional

PointOfretail (address, name)

IVM (serial_number, manuf)

InstalledAt (serial_number, manuf, address, nr)

- serial_number, manuf : **FK** (IVM)
- address : **FK** (PointOfretail)

Shelve (serial_number, manuf, nr, height, category_name)

- serial_number, manuf : **FK** (IVM)
- category_name : **FK** (Category.name)
- **IC-1** – All **Shelve** primary key combinations must appear in **AmbientTempShelf**, **Cold_Shelf** or **WarmShelf** relations.
- **IC-2** – No **Shelve** primary key combinations can appear in both **AmbientTempShelf, ColdShelf** or **WarmShelf** relations at the same time.

AmbientTempShelf (serial_number, manuf, nr)

- serial_number, manuf, nr : **FK** (Shelve)

ColdShelf (serial_number, manuf, nr)

- serial_number, manuf, nr : **FK** (Shelve)

WarmShelf (serial_number, manuf, nr)

- serial_number, manuf, nr : **FK** (Shelve)

Product (ean, descr)

- **IC-3** – All **Product** ean must appear in **Has** relation.

Planogram (serial_number, manuf, nr, ean, faces, units, loc)

- serial_number, manuf, nr : **FK** (Shelves)
- ean : **FK** (Product)

Has (name, ean)

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

Category (name)

SimpleCategory (name)

- name : **FK** (Category)

SuperCategory (name)

- name : **FK** (Category)
- **IC-4** – All **SuperCategory** name must also appear in **HasOther** relation.

HasOther (simple_category_name, super_category_name)

- Simple_category_name : **FK** (SimpleCategory.name)
- Super_category_name : **FK** (SuperCategory.name)
- **IC-5** – simple_category_name and super_category_name cannot be the same.

Retailer (tin, name)

- **UNIQUE**(name)

ResponsibleFor (serial_number, manuf, tin, category_name)

- serial_number, manuf : **FK** (IVM)
- tin: **FK** (Retailer)
- Category_name : **FK** (Category.name)

ReplenishmentEvent (serial_number, manuf, nr, ean, instant, tin, units)

- serial_number, manuf, nr, ean : **FK** (Planogram)
- tin : **FK** (Retailer)
- **IC-8** – units must be less or equal to the units of the **Planogram** relation with primary key serial_number, manuf, nr and ean.
- **IC-9** – category_name of the **Planogram** relation with primary key serial_number, manuf, nr and ean, and tin must appear in the **ResponsibleFor** relation.

RI-6: a Category(1) cannot have a Sub-Category(2) that contains Category(1).

Álgebra Relacional

1. $((\pi_{ean} (\sigma_{name = "Barras Energéticas"} (has))) \cap (\pi_{ean} (\sigma_{inst > '2021/12/32' \wedge units > 10} (ReplenishmentEvent)))) \bowtie Product.$
2. $\pi_{serial\_number}(\sigma_{ean = "9002490100070"} (Planogram))$.
3. $G_{count()} (\sigma_{super\_category\_name = "Sopas Take-Away"} (HasOther)$.
4. $SUM\_TABLE <- {}_{ean}G_{sum(units)} (ReplenismentEvent)$
   $MAX\_VAL <- G_{max(sum(units)} (SUM\_TABLE)$
   $(\pi_{ean}(MAX\_VAL \bowtie SUM\_TABLE)) \bowtie Product.$

SQL

1. ((SELECT ean
   FROM Has
   WHERE name = ‘Barras Energéticas’)
   INTERSECT
   (SELECT ean
   FROM ReplenishmentEvent
   WHERE inst = ‘2021/12/32’ AND units > ‘10’))
   NATURAL JOIN Product.

2. SELECT serial_number
   FROM Planogram
   WHERE ean = ‘9002490100070’.

3. SELECT COUNT(*)
   FROM HasOther
   WHERE super_category_name = ‘Sopas Take-Away’.

4. SELECT ean
   FROM ReplenishmentEvent
   WHERE units = (SELECT MAX
   FROM (SELECT SUM(units)

   FROM ReplenishmentEvent))

   FROM (MAX_VAL
   NATURAL JOIN SUM_TABLE))
   NATURAL JOIN Product.