Projeto BD - Parte 2

Nome	Número	Esforço (horas)	Contribuição (%)
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Grupo 108 – Turno BD2L16

Modelo Relacional

- Product(ean, descr)
  Integrity Constraints:
  - (IC-1) Each Product must participate in the 'has' association.
- IVM(serial number, manuf)
- Point of Retail(address, name)
- Retailer(TIN, name)
  - UNIQUE(name)
- Shelve(serial number, manuf, nr, cat name, height)
  - serial number: FK(IVM.serial number)
  - manuf: FK(IVM.manuf)
  - cat name: FK(Category.name)
    Integrity Constraints:
  - (IC-2) serial number, manuf, and nr cannot exist in more than one of the following: Ambient Temp Shelf, Warm Shelf, and Cold Shelf.
  - (IC-3) serial number, manuf, and nr must exist in one of the followings: Ambient Temp Shelf, Warm Shelf, and Cold Shelf.
- Replenishment Event(ean, serial number, manuf, nr, instant, units, TIN)
  - ean, serial number, manuf, nr: FK(planogram.ean, planogram.serial number, planogram.manuf, planogram.nr)
  - TIN: FK(Retailer.TIN)
    Integrity Constraints:
  - (IC-4) units (Replenishment Event.units) cannot be bigger than units (Planogram.units)
  - (IC-5) The replenished product (Product.ean) must participate in the relation "has(product, category)" such that the Category "category", Category(category), is an attribute (category name) of the 'Shelve' with key (serial number, manuf, nr).
  - (IC-6) The replenished product (Product.ean) must participate in the association 'has(product, category) with Category category, such that Category(category) must participate in the association responsible-for.

- Ambient Temp Shelf(serial number, nr)
  - serial number, nr: FK(Shelve.serial number, Shelve.nr)
- Warm Shelf(serial number, nr)
  - serial number, nr: FK(Shelve.serial number, Shelve.nr)
- Cold Shelf(serial number, nr)
  - serial number, nr: FK(Shelve.serial number, Shelve.nr)

- Category(<u>name</u>)

  Integrity Constraints:

  - (IC-7) name should exist in 'Simple Category' or in 'Super Category'
- Simple Category(<u>name</u>)
  - name: FK(Category.name)
- Super Category(<u>name</u>)
  - name: FK(Category.name)
- has-other(<u>category</u>, super category)
  - category: FK(Category.name)
  - super category: FK(Super Category.name)

    Integrity Constraints:
  - (IC-8) each Super Category(super category) must participate in the association 'has-other'.
  - (IC-9) category is always different than super category.
  - (IC-10) no category can have circularity in its hierarchy.
- has(<u>ean</u>, <u>name</u>)
  - ean: FK(Product.ean)
  - name: FK(Category.name)
- installed-at(<u>serial number</u>, <u>manuf</u>, address, nr)
  - serial number, manuf: FK(IVM.serial number, IVM.manuf)
  - address: FK(Point of Retail.address)
- planogram(<u>ean</u>, <u>serial number</u>, <u>manuf</u>, <u>nr</u>, faces, units, loc)
  - ean: FK(Product.ean)
  - serial number, manuf, nr: FK(Shelve.serial number, Shelve.manuf, Shelve.nr)

    Integrity Constraints:
  - (IC-11) units (Replenishment Event.units) cannot be greater than units (Planogram.units)
- responsible-for(<u>name</u>, <u>TIN</u>, <u>serial number</u>, manuf)
  - name: FK(Category.name)
  - TIN: FK(Retailer.TIN)
  - serial number, manuf: FK(IVM.serial number, IVM.manuf)

Álgebra Relacional

1. $t \leftarrow Category \bowtie Product \bowtie planogram \bowtie has \bowtie ReplenishmentEvent$
   $\pi_{ean,descr}\left(\sigma_{units>10 \wedge instant>2021/12/31 \wedge name=\text{Barras Energéticas}}(t)\right)$

2. $\pi_{serialnumber}\left(\sigma_{ean=9002490100070}(IVM \bowtie Shelve \bowtie planogram \bowtie Product)\right)$

3. ${}^{supercategory}G_{COUNT(\ )}\left(\sigma_{supercategory=SopasTake-A} \quad (has - other)\right)$

4. $t \leftarrow Product \bowtie planogram \bowtie ReplenishmentEvent$
   $\underline{max \leftarrow G_{MAX(units)}(ReplenishmentEvent)}$
   $\pi_{ean,descr}\left(\sigma_{units=max}(t)\right)$

SQL

1. **SELECT** ean, descr
   FROM Category
   NATURAL JOIN Product
   NATURAL JOIN planogram
   NATURAL JOIN has
   NATURAL JOIN Replenishment Event
   WHERE units > 10
   AND instant > 2021/12/31
   AND nome='Barras Energéticas';

2. **SELECT** serial number
   FROM IVM
   NATURAL JOIN Shelve
   NATURAL JOIN planogram
   NATURAL JOIN Product
   WHERE ean = 9002490100070;

3. **SELECT COUNT**(super category)
   FROM has-other
   WHERE super category = 'Sopas Take-Away';

4. **SELECT** ean, descr
   FROM Product
   NATURAL JOIN planogram
   NATURAL JOIN Replenishment Event
   WHERE units = (
   SELECT MAX(units)
   FROM Replenishment Event
   );