

Base de Dados 2021/2022

Projeto BD - Parte 2

Grupo nº 137, Laboratório BD2L10, Professor Flávio Martins

Aluno	Número	Percentagem (%)	Esforço Total (h)
Rúben Nobre	99321	33	8
Alexandra Pato	97375	33	8
Teresa Costa	99177	33	8

Modelo Relacional

ivm(manuf, serial_number)

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

- manuf, serial_number: FK(ivm.manuf, ivm.serial_number)
- category_name: FK(category.name)
- RI-5: A product may only be replenished in a shelf where its category is present
- RI'-1: A shelf must exist in "ambientTempShelf", "warmShelf", or "coldShelf"
- RI'-2: No shelf can exist at the same time in any combination of "ambientTempShelf", "warmShelf", and "coldShelf"

ambientTempShelf(manuf, serial_number, nr)

- manuf, serial_number, nr: FK(shelve.manuf, shelve.serial_number, shelve.nr)

warmShelf(manuf, serial_number, nr)

- manuf, serial_number, nr: FK(shelve.manuf, shelve.serial_number, shelve.nr)

coldShelf(manuf, serial_number, nr)

- manuf, serial_number, nr: FK(shelve.manuf, shelve.serial_number, shelve.nr)

product(ean, descr)

- RI'-3: Every product must participate in the "has" association

has(ean, name)

- ean: FK(product)
- name: FK(category)

category(name)

- RI-1: A category mustn't contain itself
- RI-2: There mustn't exist hierarchical cycles of categories
- RI'-4: A category must exist in "simpleCategory" or "superCategory"
- RI'-5: No category can exist at the same time in any combination of "simpleCategory" and "superCategory"

simpleCategory(name)

- name: FK(category.name)

superCategory(name)

- name: FK(category.name)
- RI'-6: A super category must participate in the "hasOther" association

pointOfRetail(address, name)

installedAt(manuf, serial_number, address, nr)

- manuf, serial_number: FK(ivm.manuf, ivm.serial_number)
- address: FK(pointOfRetail)

hasOther(super_cat, child_cat)

- super_cat: FK(superCategory.name)
- child_cat: FK(category.name)

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

- ean: FK(product)
- manuf, serial_number, nr: FK(shelve.manuf, shelve.serial_number, shelve.nr)
- RI-4: The number of replenished units in a Replenishment Event must not exceed the number of units specified in the planogram

retailer(tin, name)

- UNIQUE(name)

responsibleFor(manuf, serial_number, tin, name)

- manuf, serial_number: FK(ivm.manuf, ivm.serial_number)
- tin: FK(retailer)
- name: FK(category)

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

- ean, manuf, serial_number, nr: FK(planogram.ean, planogram.manuf, planogram.serial_number, planogram.nr)
- tin: FK(retailer)
- RI-6: A product may only be replenished by a retailer that's responsible for said product's category.

Álgebra Relacional

1. $\pi_{ean,descr}(\sigma_{name="Barras Energéticas" \wedge instant > "2021/12/31" \wedge units > 10} (has \bowtie replenishmentEvent \bowtie product))$
2. $\pi_{manuf,serial_number}(\sigma_{ean="9002490100070"}(planogram))$
3. $G_{count}()(\sigma_{super_category="Sopas Take-Away"}(hasOther))$
4. $T \rightarrow (ean,descr G_{sum(units) \rightarrow total_units}(product \bowtie replenishmentEvent))$
 $result \leftarrow \pi_{ean,descr}(T \bowtie G_{max(total_units) \rightarrow total_units}(T))$

SQL

1.

```
SELECT DISTINCT ean, descr
FROM has NATURAL JOIN replenishmentEvent NATURAL JOIN product
WHERE name='Barras Energéticas' AND instant > '2021/12/31' AND units > 10;
```
2.

```
SELECT manuf, serial_number
FROM planogram
WHERE ean='9002490100070';
```
3.

```
SELECT COUNT (*)
FROM hasOther
WHERE super_category = "Sopas Take-Away"
```
4.

```
WITH T as (
  SELECT ean, descr, SUM(units) AS total_units
  FROM replenishmentEvent
  NATURAL JOIN product
  GROUP BY ean, descr
)
SELECT ean, descr
FROM (
  T NATURAL JOIN (
    SELECT MAX(total_units)
    AS total_units
    FROM T
  )
)
AS result
```

Observações

1. Modelo Relacional:
 - a. RI-n: Restrição de Integridade do enunciado
 - b. RI'-n: Restrição de Integridade criada exclusivamente para o modelo relacional
2. Álgebra Relacional:
 - a. Tomou-se “todos os produtos que foram repostos em mais de 10 unidades” como “todos os produtos em que houve reposição, num dado instante, de mais de 10 unidades”;
 - b. Tomou-se “todas as IVMs onde este produto poderá ser apresentado” como “todas as IVMs com planograma referente ao produto”;
 - c. Tomou-se “produto mais repostado” como “produto que, no total, teve mais unidades repostas”;