Aufgabe 2

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π_{LName}

Aufgabe 1

1. **RA**: π_{TNr}(T) - π_{TNr}(LL)

TK: { t | (∃ u: T(u) ∧ t = u[TNr])
∧ (∃ k: LL(k))
∧ (∀ k: ¬k[TNr] = u[Tnr])}

2. **RA**: $\pi_{PNr}(\sigma_{OrtL \neq OrtP}(LL \bowtie \rho_{OrtL \leftarrow Ort}(L) \bowtie \rho_{OrtP \leftarrow Ort}(P)))$

TK: { t | (∃ u: LL(u) ∧ t = u[Pnr])
∧ (∃ v: L(v) ∧ v[LNr] = u[LNr])
∧ (∃k: P(k) ∧ k[PNr] = u[PNr])
∧¬(v[Ort] = k[Ort]) }

3. **RA**: $\pi_{PName}((\pi_{PNr,TNr}(LL) \div \pi_{TNr}(T)) \bowtie (P))$

TK: { t | (∃ u: P(u) ∧ t = u[PName])
∧ (∃ k: LL(k) ∧ k[PNr] = u[PNr])
∧ (∃ v: T(v))
∧ (∀ v: v[TNr] = k[TNr])}

Aufgabe 2

{t | (∃ u: L(u) ∧ t = u[LName] ∧¬u[Ort] = 'Marburg')
∧ (∃ k: T(k) ∧ k[Gewicht] < 15)
∧ (∃ v: LL(v) ∧ v[LNr] = u[LNr] ∧ v[TNr] = k[TNr])}

Aufgabe 3

1. $count_{PNr}(\sigma_{Gewicht \geq 50}(T \bowtie LL))$
2. $\tau_{c,LName}(\gamma_{LName,c \leftarrow sum(Menge)}(L \bowtie LL))$
3. $\pi_{Ort}(\sigma_{c<8}(L \bowtie \gamma_{LNr,c \leftarrow count(LNr)}(LL)))$
4.

$A_1 = \gamma_{PNr,c \leftarrow count(LNr)}(LL)$
$A_2 = \gamma_{PNr,m \leftarrow sum(Menge)}(LL \bowtie (\sigma_{Farbe='Schwarz'}(T)))$
$\pi_{PNr}(\sigma_{(m/c>60)}(A_1 \bowtie A_2))$