1. TAD Base de Datos

TAD Base de Datos

igualdad observacional

$$\left(\begin{array}{l}(\forall\ b_1,b_2\text{:bdd})\ (b_1 =_{\text{obs}} b_2) \Leftrightarrow \left(\begin{array}{l}\text{tablas}(b_1) =_{\text{obs}} \text{tablas}(b_2) \wedge (\forall\ t_1,t_2\text{:tabla})(\{\ t_1,\ t_2\ \} \in \\ \text{tablas}(b_1) \wedge \{\ t_1,\ t_2\ \} \in \text{tablas(b2)})\ \text{camposDeJoin}(t_1,t_2,b_1) =_{\text{obs}} \text{camposDeJoin}(t_1,t_2,b_2) \wedge \\ \text{QueTriggerea?}(t_1,b_1) =_{\text{obs}} \text{QueTriggerea?}(t_1,b_1)\end{array}\right)\end{array}\right)$$

géneros bdd

exporta **reg, generadores, observadores, otras operaciones

usa **Nat, String, Campo, Tipo

observadores básicos

Tablas : bdd $\longrightarrow$ conj(tabla)

CamposDeJoin : tabla t_1 × tabla t_2 × bdd b $\longrightarrow$ conj(campo) $\{t_1 \in \text{tablas(b)} \wedge t_2 \in \text{tablas(b)}\}$

QueTriggerea? : tabla t × bdd b $\longrightarrow$ conj(tabla) $\{\text{t} \in \text{tablas(b)}\}$

#Modificaciones : tabla t × bdd b $\longrightarrow$ nat $\{\text{t} \in \text{tablas}(b\}$

generadores

Nuevobdd : $\longrightarrow$ bdd

AgTabla : tabla t × bdd b $\longrightarrow$ bdd

AgJoin : tabla t_1 × tabla t_2 × campo c × bdd b $\longrightarrow$ bdd
$\{t_1 \in \text{tablas(b)} \wedge t_2 \in \text{tablas(b)} \wedge \text{c} \in (\text{claves}(t_1) \cup \text{claves}(t_2))\}$

DefTrigger : tabla t_1 × tabla t_2 × bdd b $\longrightarrow$ bdd
$\{t_1 \in \text{tablas(b)} \wedge t_2 \in \text{tablas(b)} \wedge (\text{claves}(t_2) \subseteq \text{claves}(t_1)) \wedge t_1 \neq t_2\}$

ElimJoin : tabla t_1 × tabla t_2 × campo c × bdd b $\longrightarrow$ bdd
$\{\{t_1, t_2\} \in \text{tablas(b)} \wedge_{\text{L}} \text{c} \in \text{CamposDeJoin}(t_1, t_2, \text{b})\}$

ElimTrigger : tabla t_1 × tabla t_2 × bdd b $\longrightarrow$ bdd $\{t_1 \in \text{tablas(b)} \wedge_{\text{L}} t_2 \in \text{QueTriggerea?}(t_1, \text{b})\}$

**AgregarReg : reg r × tabla t × bdd b $\longrightarrow$ bdd
$\left\{\begin{array}{l}\text{t} \in \text{tablas(b)} \wedge_{\text{L}} ((\forall\ t_1\text{:Tabla})(t_1 \in \text{QueTriggerea?(t,b)})) \Rightarrow_{\text{L}} ((\forall\ \text{c:Campo})(\text{c} \in \text{claves}(t_1))) \Rightarrow_{\text{L}} \\ ((\forall\ r_1\text{:reg})(r_1 \in \text{registros}(t_1)))\ \text{NoRepiten}(r_1, \text{r}, \text{c})\end{array}\right\}$

ElimRegStr : campo c × string s × tabla t_1 × bdd b $\longrightarrow$ bdd $\{\neg(\text{Nat?}(\text{tipo}(c) \wedge t_1 \in \text{tablas}(b)\}$

ElimRegNat : campo c × nat n × tabla t_1 × bdd b $\longrightarrow$ bdd $\{(\text{Nat?}(\text{tipo}(c) \wedge t_1 \in \text{tablas}(b)\}$

otras operaciones

hayJoin? : tabla t_1 × tabla t_2 × bdd b $\longrightarrow$ bool $\{t_1 \in \text{tablas(b)} \wedge t_2 \in \text{tablas(b)}\}$

verJoin : tabla t_1 × tabla t_2 × campo c × bdd b $\longrightarrow$ tabla
$\{t_1 \in \text{tablas(b)} \wedge t_2 \in \text{tablas(b)} \wedge_{\text{L}} \text{c} \in \text{CamposdeJoin}(t_1, t_2, \text{b})\}$

AgregarReg : reg$r$ × tabla t_1 × bdd b $\longrightarrow$ bdd $\{t_1 \in \text{tablas}(b)\}$

axiomas $\forall t_1, t_2, t_3, t_4$: tabla, $\forall r$: registro, $\forall c$: campo, $\forall cs$: conj(campo), $\forall n$: nat, $\forall s$: string

Tablas(Nuevobdd) $\equiv \emptyset$

Tablas(AgTabla(t_1,b)) $\equiv$ **if** $t_1 \in$ tablas(b) **then** tablas(b) **else** Ag(t_1,tablas(b)) **fi**

Tablas(AgJoin(t_1,t_2,c,b)) $\equiv$ Tablas(b)

Tablas(DefTrigger(t_1,t_2,b)) $\equiv$ Tablas(b)

Tablas(ElimJoin(t_1, t_2, c, b)) $\equiv$ Tablas(b)

Tablas(ElimTrigger(t_1, t_2, b)) $\equiv$ Tablas(b)

Tablas(AgregarReg(r, t, b)) $\equiv$ Tablas(b)-Ag(t, QueTriggerea?(t, b))) $\cup$ Ag(AñadirReg(t,r), Triggereados(r, t, QueTriggerea?(t, b)))

Tablas(ElimRegStr(c, s, t, b)) $\equiv$ Ag(borrarPalabra(t, c, s), Tablas(b)-t)

Tablas(ElimRegNat(c, n, t, b)) $\equiv$ Ag(borrarValor(t, c, n), Tablas(b)-t)

Tablas(ElimJoin(t_1,t_2,c,b)) $\equiv$ Tablas(b)

Tablas(AgregarReg(r,t,b)) $\equiv$ Tablas(b) - Ag(t,QueTriggerea?(t,b)))$\cup$ Ag(añadirReg(t,r),Triggereados(r,t,QueTriggerea?(

CamposDeJoin(t_1,t_2,AgTabla(t_3,b)) $\equiv$ CamposDeJoin(t_1,t_2,b)

CamposDeJoin(t_1,t_2,AgJoin(t_3,t_4,c,b)) $\equiv$ CamposDeJoin(t_1,t_2,b)

CamposDeJoin(t_1,t_2,DefTrigger(t_3,t_4,b)) $\equiv$ CamposDeJoin(t_1,t_2,b)

CamposDeJoin(t_1, t_2, ElimJoin(t_3, t_4, c, b)) $\equiv$ **if** (($t_1 =_{\text{obs}} t_3 \vee t_1 =_{\text{obs}} t_4$) $\wedge$ ($t_2 =_{\text{obs}} t_3 \vee t_2 =_{\text{obs}} t_4$)) **then**
c - CamposDeJoin(t_1, t_2, b)
else
CamposDeJoin(t_1, t_2, b)
fi

CamposDeJoin(t_1, t_2, ElimTrigger(t_3, t_4, b)) $\equiv$ CamposDeJoin(t_1, t_2, b)

CamposDeJoin(t_1, t_2, AgregraReg(r, t_3,b)) $\equiv$ CamposDeJoin(t_1, t_2, b)

CamposDeJoin(t_1, t_2, ElimRegStr(c, s, t_3, b)) $\equiv$ CamposDeJoin(t_1, t_2, b)

CamposDeJoin(t_1, t_2, ElimRegNat(c, n, t_3, b)) $\equiv$ CamposDeJoin(t_1, t_2, b)

QueTriggerea?(t_1,AgTabla(t_2,b)) $\equiv$ QueTriggerea?(t_1,b

QueTriggerea?(t_1,AgJoin(t_2,t_3,c,b)) $\equiv$ QueTriggerea?(t_1,b

QueTriggerea?(t_1,DefTrigger(t_2,t_3,b)) $\equiv$ **if** $\neg$($t_1 =_{\text{obs}} t_2 \wedge t_1 =_{\text{obs}} t_3$) **then**
QueTriggerea?(t_1,b)
else
if ($t_1 =_{\text{obs}} t_2$) **then**
Ag(t_3,QueTriggerea?(t_1,b)
else
QueTriggerea?(t_1,b)
fi
fi

HayJoin?(t_1, t_2, b) $\equiv$ **if** $\emptyset$?(camposDeJoin(t_1, t_2, b) **then** false **else** true **fi**

VerJoin(t_1, t_2, c, b) $\equiv$ UnirTablas(t_1, t_2, c,registros(t_2))

Fin TAD