1. TAD Registro

TAD Registro

igualdad observacional

$$\left(\begin{array}{l} (\forall\ r_1,r_2{:}\text{reg})\ (r_1 =_{\text{obs}} r_2) \Leftrightarrow \left(\text{campos}(r_1) =_{\text{obs}} \text{campos}(r_2) \wedge_{\text{L}} \left((\forall\ \text{c:Campos}) \right. \right. \\ \left. \left((\text{c} \in \text{campos}(r_1))) \Rightarrow_{\text{L}} \left((\text{Nat?}(\text{tipo}(\text{c})) \Rightarrow_{\text{L}} (\text{ValorEn}(r_1,\ \text{c}) =_{\text{obs}} \text{ValorEn}(r_2,\ \text{c}))) \wedge \right. \right. \right. \\ \left. \left. \left. (\neg\text{Nat?}(\text{tipo}(\text{c})) \Rightarrow_{\text{L}} (\text{PalabraEn}(r_1,\ \text{c}) =_{\text{obs}} \text{PalabraEn}(r_2,\ \text{c}))) \right) \right) \right) \end{array} \right)$$

géneros reg

exporta reg, generadores, observadores, otras operaciones

usa Nat, String, Campo, Tipo

observadores básicos

Campos : reg $\longrightarrow$ conj(Campo)
valorEn : reg r $\times$ campo c $\longrightarrow$ Nat $\{\text{Nat?}(\text{tipo}(\text{c})) \wedge \text{c} \in \text{Campos}(\text{r})\}$
palabraEn : reg r $\times$ campo c $\longrightarrow$ String $\{\neg\text{Nat?}(\text{tipo}(\text{c})) \wedge \text{c} \in \text{Campos}(\text{r})\}$

generadores

NuevoRegistro : $\bullet$ $\longrightarrow$ reg
agValor : reg r $\times$ campo c $\times$ nat n $\longrightarrow$ reg $\{\text{c} \notin \text{campos}(\text{r}) \wedge \text{Nat?}(\text{tipo}(\text{c}))\}$
agPalabra : reg r $\times$ campo c $\times$ string s $\longrightarrow$ reg $\{\text{c} \notin \text{campos}(\text{r}) \wedge \neg\text{Nat?}(\text{tipo}(\text{c}))\}$

otras operaciones

Combinar : reg $r_1 \times$ reg $r_2 \longrightarrow$ reg
CombinarDeAcuerdoA : reg $r_1 \times$ reg $r_2 \times$ conj(campo) cs $\longrightarrow$ reg
Coincide? : conj(reg) rs $\times$ reg r $\times$ campo c $\longrightarrow$ bool $\{(\forall\ r_1 : \text{reg})\ r_1 \in rs \Rightarrow (\text{c} \in \text{campos}(r_1))\}$
DameCoincidente : conj(reg) $rs \times$ reg $r \times$ campo c $\longrightarrow$ bool
$\{(\text{Coincide?}(rs, r, c) \wedge (\forall\ r_1 : \text{reg})\ (r_1 \in rs \Rightarrow \text{c} \in \text{campos}(r_1))\}$
DameCoincidentesVal : campo $r \times$ nat $n \times$ conj(reg) $rs \longrightarrow$ conj(reg) $\{\text{Nat?}(\text{tipo}(c))\}$
DameCoincidentesPal : campo $r \times$ string $s \times$ conj(reg) $rs \longrightarrow$ conj(reg) $\{\neg\text{Nat?}(\text{tipo}(c))\}$
noRepiten : reg $r_1 \times$ reg $r_2 \times$ campo c $\longrightarrow$ bool $\{\text{c} \in \text{campos}(r_1) \wedge \text{c} \in \text{campos}(r_2)\}$
AgYCompDefault : reg r $\times$ conj(campo) $cs \longrightarrow$ reg
AgregoPorDefault : reg r $\times$ campo c $\longrightarrow$ reg $\{\neg\ (\text{c} \in \text{campos}(\text{r})\}$

axiomas $\forall r_1, r_2$: reg, $\forall c_1, c_2$: campo, $\forall cs$: conj(campo), $\forall n$: nat, $\forall s$: string

axiomas $\forall r_1, r_2$: reg, $\forall c$: campo, $\forall cs$: conj(campo), $\forall n$: nat, $\forall s$: string, $\forall rs$: conj(reg)

campos(nuevoReg) $\equiv \emptyset$
campos(agValor(r_1,c_1,n) $\equiv$ Ag(c_1,campos(r_1))
campos(agPalabra(r_1,c_1,s)) $\equiv$ Ag(c_1,campos(r_1))

valorEn(agValor(r_1,c_1,n), c_2) $\equiv$ **if** $c_1 =_{\text{obs}} c_2$ **then** n **else** valorEn(r_1, c_2) **fi**
valorEn(agPalabra(r_1,c_1,s),c_2) $\equiv$ valorEn(r_1,c_2)

palabraEn(agValor(r_1, c_1,n), c_2) $\equiv$ palabraEn(r_1, c_2)
palabraEn(agPalabra(r_1,c_1,s), c_2) $\equiv$ **if** $c_1 =_{\text{obs}} c_2$ **then** s **else** palabraEn(r_1, c_2) **fi**

Combinar(r_1, r_2) $\equiv$ CombinarDeAcuerdoA(r_1, c_1,campos(c_2))

CombinarDeAcuerdoA(r_1, r_2,cs) $\equiv$ **if** $\emptyset$?(cs) **then**
r_1
else
if DameUno(c)$\in$campos(r_1) **then**
CombinarDeAcuerdoA(r_1, r_2, SinUno(cs))
else
if Nat?(tipo(DameUno(c))) **then**
agValor$\big($CombinarDeAcuerdoA(r_1, r_2,SinUno(cs)),DameUno(c),
valorEn(r_2,DameUno(cs))$\big)$
else
agPalabra$\big($CombinarDeAcuerdoA(r_1, r_2,SinUno(cs)),
DameUno(c),palabraEn(r_2,DameUno(cs))$\big)$
fi
fi
fi
campos(agPalabra(r_1,c_1,s)) $\equiv$ Ag(c_1,campos(r_1))

valorEn(agValor(r_1,c_1,n), c_2) $\equiv$ **if** $c_1 =_{\text{obs}} c_2$ **then** n **else** valorEn(r_1, c_2) **fi**
valorEn(agPalabra(r_1,c_1,s),c_2) $\equiv$ valorEn(r_1,c_2)

palabraEn(agValor(r_1, c_1,n), c_2) $\equiv$ palabraEn(r_1, c_2)
palabraEn(agPalabra(r_1,c_1,s), c_2) $\equiv$ **if** $c_1 =_{\text{obs}} c_2$ **then** s **else** palabraEn(r_1, c_2) **fi**

Coincide?(rs, r, c) $\equiv$ **if** $\emptyset$?(rs) **then**
false
else
$\neg$ NoRepiten(DameUno(rs), r, c) $\vee$ Coincide?(SinUno(rs), r, c)
fi

DameCoincidente(rs, r, c) $\equiv$ **if** NoRepiten(DameUno(rs), r, c) **then**
DameCoincidente(SinUno(rs), r, c)
else
DameUno(rs)
fi

Combinar(r_1, r_2) $\equiv$ CombinarDeAcuerdoA(r_1, c_1,campos(c_2))

CombinarDeAcuerdoA(r_1, r_2, cs) $\equiv$ **if** $\emptyset$?(cs) **then**
r_1
else
if DameUno(c)$\in$campos(r_1) **then**
CombinarDeAcuerdoA(r_1, r_2, SinUno(cs))
else
if Nat?(tipo(DameUno(c))) **then**
agValor$\big($CombinarDeAcuerdoA(r_1, r_2,SinUno(cs)),DameUno(c),
valorEn(r_2,DameUno(cs))$\big)$
else
agPalabra$\big($CombinarDeAcuerdoA(r_1, r_2,SinUno(cs)),
DameUno(c),palabraEn(r_2,DameUno(cs))$\big)$
fi
fi
fi

noRepiten(r_1, r_2, c) $\equiv$ Nat?(Tipo(c)) $\wedge_{\text{L}}$ $\neg$ (valorEn(r_1, c) $=_{\text{obs}}$ valorEn(r_2, c))) $\vee$ ($\neg$ Nat?(tipo(c)) $\wedge_{\text{L}}$
$\vee$(palabraEn(r_1, c) $=_{\text{obs}}$ palabraEn(r_2, c)))

DameCoincidentesVal(c, n, rs) $\equiv$ **if** $\emptyset?(rs)$ **then**
$\emptyset$
else
if ValorEn(DameUno(rs),c)$=_{\text{obs}}$ n **then**
Ag(DameUno(rs),DameCoincidentesVal(c,n,SinUno(rs)))
else
DameCoincidentesVal(c,n,SinUno(rs))
fi
fi

DameCoincidentesPal(c, s, rs) $\equiv$ **if** $\emptyset?(rs)$ **then**
$\emptyset$
else
if PalabraEn(DameUno(rs),c)$=_{\text{obs}}$ s **then**
Ag(DameUno(rs),DameCoincidentesPal(c,s,SinUno(rs)))
else
DameCoincidentesPal(c,s,SinUno(rs))
fi
fi

AgYCompDefault(r,cs) $\equiv$ **if** $\emptyset?$(cs) **then**
NuevoRegistro
else
if DameUno(cs) $\in$ campos(r) **then**
if Nat?(tipo(DameUno(cs))) **then**
AgValor(AgYCompDefault(r,SinUno(cs)),DameUno(cs),
ValorEn(r,DameUno(cs)))
else
AgPalabra(AgYCompDefault(r,SinUno(cs)),DameUno(cs),
PalabraEn(r,DameUno(cs)))
fi
else
AgregoPorDefault(AgYCompDefault(r,SinUno(cs)),DameUno(cs))
fi
fi

AgregoPorDefault(r,c) $\equiv$ **if** Nat?(tipo(c) **then** AgValor(r, c, 0) **else** AgPalabra(r, c, "Default") **fi**

Fin TAD