

CSE 579: Knowledge Representation and Reasoning

Project Code

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assign-referee.txt

% Search Space

1 {assign(Cas_id,Reff_id) : referee(Reff_id,Reff_type, Wrkld_max, Wrkld_prv, Pymnt_Prev)} 1 :-
case(Cas_id,Case_type, Eff, Dmg, Pstl_Cde, Pymnt).

% constraints

:- Workload_sum = #sum{Eff,Reff_id ,Cas_id :
 assign(Cas_id,Reff_id),
 case(Cas_id, Case_type, Eff, Dmg, Pstl_Cde, Pymnt)},
 referee(Reff_id,Reff_type, Wrkld_max,
 Wrkld_prv, Pymnt_Prev),
 Workload_sum > Wrkld_max.

:- assign(Cas_id,Reff_id),referee(Reff_id,Reff_type, Wrkld_max, Wrkld_prv,
Pymnt_Prev),case(Cas_id,Case_type, Eff, Dmg, Pstl_Cde, Pymnt),
prefRegion(Reff_id,Pstl_Cde,0).

:- assign(Cas_id,Reff_id),referee(Reff_id,Reff_type, Wrkld_max, Wrkld_prv,
Pymnt_Prev),case(Cas_id,Case_type, Eff, Dmg, Pstl_Cde, Pymnt),
prefType(Reff_id,Case_type,0).

:- assign(Cas_id,Reff_id),referee(Reff_id,Reff_type, Wrkld_max, Wrkld_prv,
Pymnt_Prev),case(Cas_id,Case_type, Eff, Dmg, Pstl_Cde, Pymnt), Reff_type==e ,
externalMaxDamage(Max_D), Dmg > Max_D.

intnum(N) :- N=#count{ 1 , Reff_id : assign(Cas_id,Reff_id),referee(Reff_id,Reff_type,
Wrkld_max, Wrkld_prv, Pymnt_Prev) , Reff_type==i }.
#maximize{N: intnum(N)}.

payment(Reff_id , Pay) :- Pay= #sum{Pymnt, Reff_id, Cas_id:assign(Cas_id, Reff_id) ,
case(Cas_id, Case_type, Eff, Dmg, Pstl_Cde, Pymnt)}, referee(Reff_id, Reff_type, Wrkld_max,
Wrkld_prv, Pymnt_Prev), Reff_type == e.

total_payment(Reff_id ,Pay_Money) :- Pay_Money=Pymnt_Prev+Pay, referee(Reff_id,
Reff_type, Wrkld_max, Wrkld_prv, Pymnt_Prev), payment(Reff_id , Pay), Reff_type == e.

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min_pay(Pymnt_Mny1) :- total_payment(Reff_id1,Pymnt_Mny1), 0==#count{1,Reff_id2 :
Pymnt_Mny1>Pymnt_Mny2,total_payment(Reff_id2,Pymnt_Mny2)
},total_payment(Reff_id1,Pymnt_Mny1).
max_pay(Pymnt_Mny1) :- total_payment(Reff_id1,Pymnt_Mny1), 0==#count{1,Reff_id2 :
Pymnt_Mny1<Pymnt_Mny2,total_payment(Reff_id2,Pymnt_Mny2)
},total_payment(Reff_id1,Pymnt_Mny1).

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pay_diff(D) :- D = (MAX-MIN), max_pay(MAX), min_pay(MIN).

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#minimize{D,Cas_id,Reff_id:pay_diff(D), assign(Cas_id,Reff_id), referee(Reff_id,Reff_type,
Wrkld_max, Wrkld_prv, Pymnt_Prev), case(Cas_id,Case_type, Eff, Dmg, Pstl_Cde, Pymnt) }.

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work(Reff_id,Case_Work) :- Case_Work = #sum{Eff , Reff_id , Cas_id :assign(Cas_id, Reff_id)
, case(Cas_id, Case_type, Eff, Dmg, Pstl_Cde, Pymnt)}, referee(Reff_id, Reff_type, Wrkld_max,
Wrkld_prv, Pymnt_Prev).
total_workload(Reff_id, TWork) :- TWork = Wrkld_prv + Case_Work, referee(Reff_id, Reff_type,
Wrkld_max, Wrkld_prv, Pymnt_Prev), work(Reff_id,Case_Work).
min_work(T_wrk1) :- total_workload(Reff_id1, T_wrk1), 0==#count{1, Reff_id2 :
T_wrk1>T_wrk2,total_workload(Reff_id2, T_wrk2) },total_workload(Reff_id1, T_wrk1).
max_work(T_wrk1) :- total_workload(Reff_id1, T_wrk1), 0==#count{1, Reff_id2 :
T_wrk1<T_wrk2,total_workload(Reff_id2, T_wrk2) },total_workload(Reff_id1, T_wrk1).
work_diff(D) :- D = (MAX-MIN), max_work(MAX), min_work(MIN).

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#minimize{D,Cas_id ,Reff_id : work_diff(D), assign(Cas_id,Reff_id), referee(Reff_id,Reff_type,
Wrkld_max, Wrkld_prv, Pymnt_Prev), case(Cas_id,Case_type, Eff, Dmg, Pstl_Cde, Pymnt) }.

```

```

#maximize{Case_Pre+Region_Pre,Reff_id: assign(Cas_id,Reff_id),referee(Reff_id,Reff_type,
Wrkld_max, Wrkld_prv, Pymnt_Prev),case(Cas_id,Case_type, Eff, Dmg, Pstl_Cde, Pymnt) ,
prefRegion(Reff_id,Pstl_Cde,Region_Pre),prefType(Reff_id,Case_type,Case_Pre)}.

```

```

#show assign/2.

```

Output for example 10 given in description:

```
sahilhadke@Sahils-Air project-code % clingo assign-referee.txt example10.txt
clingo version 5.6.2
Reading from assign-referee.txt ...
assign-referee.txt:9:31-41: info: global variable in tuple of aggregate element:
  Referee_id

assign-referee.txt:32:50-60: info: global variable in tuple of aggregate element:
  Referee_id

assign-referee.txt:44:59-69: info: global variable in tuple of aggregate element:
  Referee_id

Solving...
Answer: 1
assign(1,1) assign(2,1) assign(3,3)
Optimization: 8121
OPTIMUM FOUND

Models      : 1
  Optimum   : yes
Optimization : 8121
Calls       : 1
Time        : 0.017s (Solving: 0.00s 1st Model: 0.00s Unsat: 0.00s)
CPU Time    : 0.013s
sahilhadke@Sahils-Air project-code %
```