14/06/2016 EX2

martedì 5 gennaio 2021 15:13

Exercise 2 Given the following ASP program P:

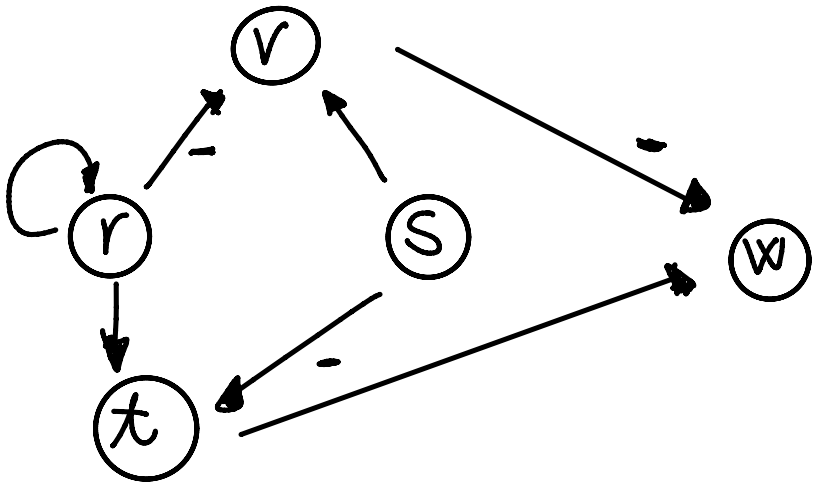
```
r(x,y) :- g(x,y).
r(x,z) :- g(x,y), r(y,z).
s(x,y) :- g(x,y).
t(x,y) :- r(x,y), not s(x,y).
v(x,y) :- s(x,y), not r(x,y).
w(x,z) :- g(x,y), t(x,y), not v(y,z).
g(a,b). g(b,c). g(d,e). g(e,f).
```

(a) tell whether P is stratified;

(b) compute the answer sets of P.

a)

IDB = {r/2, s/2, t/2,v/2,w/2}
EDB = {g/2}



P is stratified

b)

S1 = {r,s}
S2 = {t,v}
S3 = {w}

MM0 = EDB(P) = {g(a,b), g(b,c), g(d,e), g(e,f)}
P(S1)={
    r(x,y) :- g(x,y).
    r(x,z) :- g(x,y), r(y,z).
    s(x,y) :- g(x,y).
}

I = MM0
I' = Tp(I) = {r(a,b), r(b,c),r(d,e),r(e,f), s(a,b),s(b,c), s(d,e), s(e,f)}
Delta' I = {Delta' r(a,b),Delta' r(b,c), Delta'r(d,e),Delta'r(e,f),
Delta's(a,b),Delta's(b,c), Delta's(d,e), Delta's(e,f)}

Delta P = {
    Delta' r(x,z) :- g(x,y), Delta r(y,z).
}

1-iteration
I = I union {r(a,b), r(b,c),r(d,e),r(e,f), s(a,b),s(b,c), s(d,e), s(e,f)}
Delta I = {Delta r(a,b),Delta r(b,c), Delta r(d,e),Delta r(e,f), Delta s(a,b),Delta
s(b,c), Delta s(d,e), Delta s(e,f)}
Delta' I = {Delta' r(a,c), Delta' r(d,f)}

2-iteration
I = I union {r(a,c), r(d,f)}
Delta I = {Delta r(a,c), Delta r(d,f)}
Delta' I = {}

MM1 = MM0 union {r(a,b), r(b,c),r(d,e),r(e,f), r(a,c), r(d,f),
                        s(a,b),s(b,c), s(d,e), s(e,f)}

P(S2) = {
    t(x,y):- r(x,y), not s(x,y).
    v(x,y):- s(x,y), not r(x,y).
}

MM2 = MM1 union {t(a,c), t(d,f)}

P(S3)={
    w(x,y):- g(x,y), t(x,y), not v(y,z).
}

MM3 = MM2 union {}

MM(P) = {g(a,b), g(b,c), g(d,e), g(e,f),
                r(a,b), r(b,c),r(d,e),r(e,f), r(a,c), r(d,f),
                s(a,b),s(b,c), s(d,e), s(e,f),
                t(a,c), t(d,f)}