

Corrigé type du rattrapage d'outils formels

Questions de cours (Voir le cours) (6 pts)

- 1.(0.75)
2. (3 pts)
- 3.(0.75)
4. (1.5).

Exercice01 (7 pt)

*** transformation d'un nombre décimal en binaire et la somme des nombres binaires :

fmod binary is

protecting NAT .

sort List .

subsort Nat < List .

op nil : -> List [ctor] .

op ___ : List List -> List [ctor assoc id: nil] .

op bin : Nat -> List .

op inverser : List -> List .

op supz : List -> List .

op somme : List List -> List .

vars N N1 N2 N3 N4 : Nat .

var L L1 L2 : List .

ceq bin(N) = (N rem 2) bin(N quo 2) if N /= 0 .

ceq bin(N) = 0 if N == 0 .

ceq inverser(L N) = N inverser(L) if L /= nil .

ceq inverser(L N) = N if L == nil .

ceq supz(N L) = L if N == 0 and L /= nil . *** supprimer le 0 le plus à gauche.

ceq supz(N L) = N if N == 0 and L == nil .

ceq somme((L1 N1 N2), (L2 N3 N4)) = somme((L1 N1), (L2 N3)) 0 if (N2 == 0 and N4 == 0) .

ceq somme(N1, N2) = 0 if (N1 == 0 and N2 == 0) .

ceq somme(N1, N2) = 1 if (N1 == 0 and N2 == 1) or (N1 == 1 and N2 == 0) .

ceq somme((L1 N1 N2), (L2 N3 N4)) = somme((L1 N1), (L2 N3)) 1 if (N2 == 1 and N4 == 0) or (N2 == 0 and N4 == 1) .

ceq somme(N1, N2) = 1 if (N1 == 1 and N2 == 0) or (N1 == 0 and N2 == 1) .

ceq somme(N1, N2) = 1 0 if (N1 == 1 and N2 == 1) .

ceq somme((L1 N1 N2), (L2 N3 N4)) = somme((L1 1), (L2 N3)) 0 if (N2 == 1 and N4 == 1) and (N1 == 0 and N3 == 0) .

ceq somme((L1 N1 N2), (L2 N3 N4)) = somme((L1 1), (L2 N3)) 0 if (N2 == 1 and N4 == 1) and (N1 == 0 and N3 == 1) .

ceq somme((L1 N1 N2), (L2 N3 N4)) = somme((L1 N1), (L2 1)) 0 if (N2 == 1 and N4 == 1) and (N1 == 1 and N3 == 0) .

ceq somme((L1 N1 N2), (L2 N3 N4)) = somme((L1 2), (L2 N3)) 0 if (N2 == 1 and N4 == 1) and (N1 == 1 and N3 == 1) .

ceq somme((L1 N1 N2), (L2 N3 N4)) = somme((L1 1), (L2 N3)) 1 if (N2 == 2 and N4 == 1) and (N1 == 0 and N3 == 0) .

ceq somme((L1 N1 N2), (L2 N3 N4)) = somme((L1 1), (L2 N3)) 1 if (N2 == 2 and N4 == 1) and (N1 == 0 and N3 == 1) .

ceq somme((L1 N1 N2), (L2 N3 N4)) = somme((L1 N1), (L2 1)) 1 if (N2 == 2 and N4 == 1) and (N1 == 1 and N3 == 0) .

ceq somme((L1 N1 N2), (L2 N3 N4)) = somme((L1 2), (L2 N3)) 1 if (N2 == 2 and N4 == 1) and (N1 == 1 and N3 == 1) .
ceq somme(N1, N2) = 1 1 if (N1 == 2 and N2 == 1) .

endfm

Exercice 2 (7pts)

Voir la solution d'exercice du PGCD (la machine abstraite et le raffinement) ; ici, on remplace le PGCD par : $\text{PPCM}(a,b) = a*b/\text{PGCD}(a,b)$.

La machine abstraite sur 4pts

Le raffinement sur 3pts.