

2 El problema dels pitxers d'aigua

Tenim dos pitxers d'aigua, X i Y, de 4 i 3 litres de capacitat.

No hi ha marques de mesura excepte la de capacitat màxima.

Inicialment, ambdós pitxers estan buits.

L'objectiu es tenir 2 litres en X aplicant d'accions del tipus:

- Omplir X (Y).
- Omplir X des d'Y (Y des d'X).
- Buidar X (Y).
- Buidar X en Y (Y en X).

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(deffacts bf (cap X 4) (cap Y 3) (aig X 0 Y 0))
(defrule omplirX (cap X ?capX) (aig X ?x Y ?y)
  (test (< ?x ?capX)) => (assert (aig X ?capX Y ?y)))
(defrule omplirY (cap Y ?capY) (aig X ?x Y ?y)
  (test (< ?y ?capY)) => (assert (aig X ?x Y ?capY)))
(defrule buidarX (aig X ?x Y ?y)
  (test (> ?x 0)) => (assert (aig X 0 Y ?y)))
(defrule buidarY (aig X ?x Y ?y)
  (test (> ?y 0)) => (assert (aig X ?x Y 0)))
(defrule omplirXdesdY
  (cap X ?capX) (aig X ?x Y ?y)
  (test (> ?y 0)) (test (< ?x ?capX))
  (test (>= (+ ?x ?y) ?capX)) =>
  (assert (aig X ?capX Y (- ?y (- ?capX ?x)))))
(defrule omplirYdesdX
  (cap Y ?capY) (aig X ?x Y ?y)
  (test (> ?x 0)) (test (< ?y ?capY))
  (test (>= (+ ?x ?y) ?capY)) =>
  (assert (aig X (- ?x (- ?capY ?y)) Y ?capY)))
(defrule buidarXenY
  (cap Y ?capY) (aig X ?x Y ?y)
  (test (> ?x 0)) (test (<= (+ ?x ?y) ?capY)) =>
  (assert (aig X 0 Y (+ ?x ?y))))
(defrule buidarYenX
  (cap X ?capX) (aig X ?x Y ?y)
  (test (> ?y 0)) (test (<= (+ ?x ?y) ?capX)) =>
  (assert (aig X (+ ?x ?y) Y 0)))
(defrule obj
  (aig X 2 Y ?) => (printout t "Solucio trobada!" crlf) (halt))
(set-strategy breadth)
/watch facts)
/watch activations)
(reset)
(run)
(exit)

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CLIPS (V6.24 06/15/06)
CLIPS> ==> f-0      (initial-fact)
==> f-1      (cap X 4)
==> f-2      (cap Y 3)
==> f-3      (aig X 0 Y 0)
==> Activation 0      omplirY: f-2,f-3
==> Activation 0      omplirX: f-1,f-3
CLIPS> ==> f-4      (aig X 0 Y 3)
==> Activation 0      buidarYenX: f-1,f-4
==> Activation 0      buidarY: f-4
==> Activation 0      omplirX: f-1,f-4
==> f-5      (aig X 4 Y 0)
==> Activation 0      omplirYdesdX: f-2,f-5
==> Activation 0      buidarX: f-5
==> Activation 0      omplirY: f-2,f-5
==> f-6      (aig X 3 Y 0)
==> Activation 0      buidarXenY: f-2,f-6
==> Activation 0      omplirYdesdX: f-2,f-6
==> Activation 0      buidarX: f-6
==> Activation 0      omplirY: f-2,f-6
==> Activation 0      omplirX: f-1,f-6
==> f-7      (aig X 4 Y 3)
==> Activation 0      buidarY: f-7
==> Activation 0      buidarX: f-7
==> f-8      (aig X 1 Y 3)
==> Activation 0      buidarYenX: f-1,f-8
==> Activation 0      omplirXdesdY: f-1,f-8
==> Activation 0      buidarY: f-8
==> Activation 0      buidarX: f-8
==> Activation 0      omplirX: f-1,f-8
==> f-9      (aig X 3 Y 3)
==> Activation 0      omplirXdesdY: f-1,f-9
==> Activation 0      buidarY: f-9
==> Activation 0      buidarX: f-9
==> Activation 0      omplirX: f-1,f-9
==> f-10     (aig X 1 Y 0)
==> Activation 0      buidarXenY: f-2,f-10

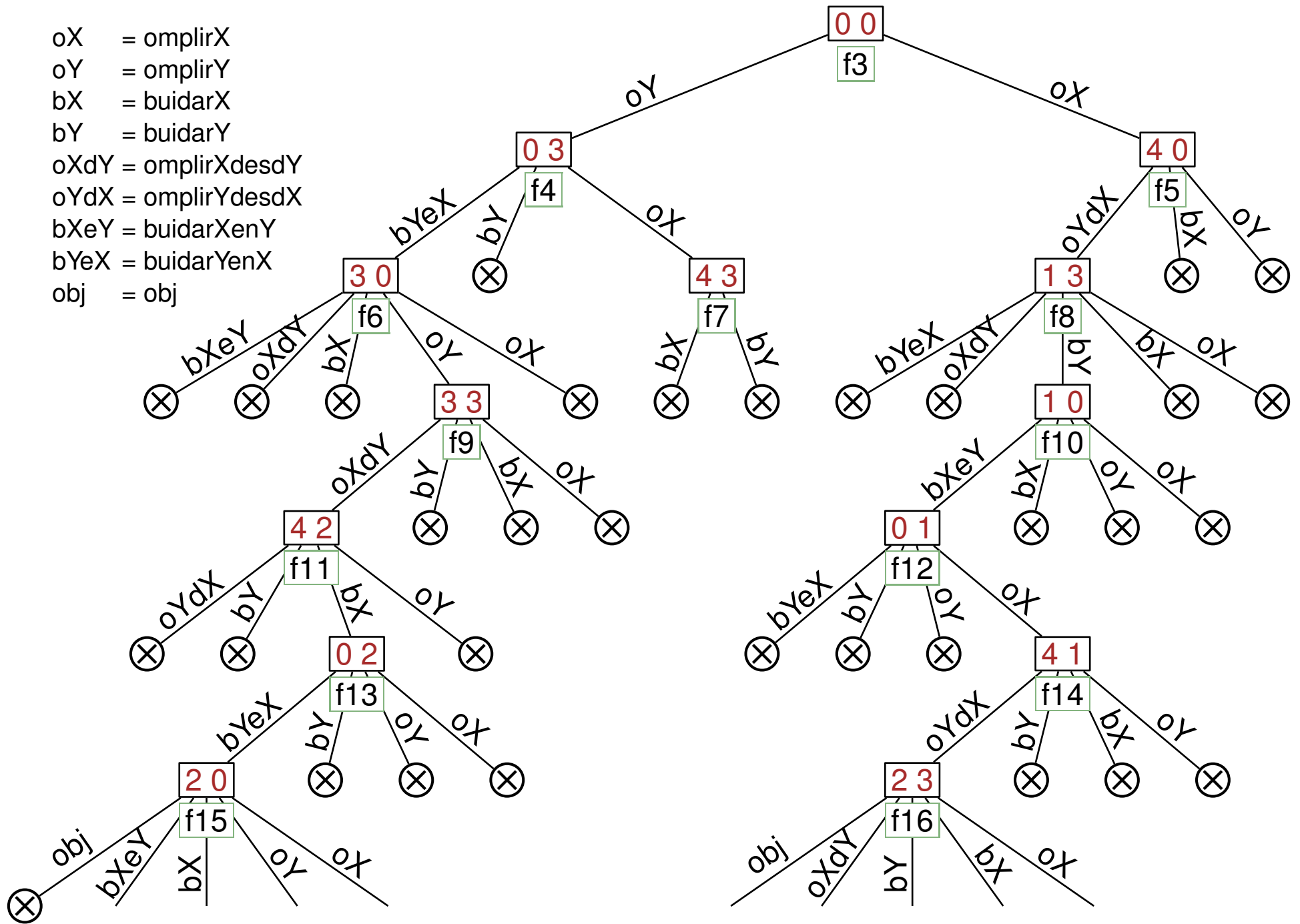
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==> Activation 0          buidarX: f-10
==> Activation 0          omplirY: f-2,f-10
==> Activation 0          omplirX: f-1,f-10
==> f-11      (aig X 4 Y 2)
==> Activation 0          omplirYdesdX: f-2,f-11
==> Activation 0          buidarY: f-11
==> Activation 0          buidarX: f-11
==> Activation 0          omplirY: f-2,f-11
==> f-12      (aig X 0 Y 1)
==> Activation 0          buidarYenX: f-1,f-12
==> Activation 0          buidarY: f-12
==> Activation 0          omplirY: f-2,f-12
==> Activation 0          omplirX: f-1,f-12
==> f-13      (aig X 0 Y 2)
==> Activation 0          buidarYenX: f-1,f-13
==> Activation 0          buidarY: f-13
==> Activation 0          omplirY: f-2,f-13
==> Activation 0          omplirX: f-1,f-13
==> f-14      (aig X 4 Y 1)
==> Activation 0          omplirYdesdX: f-2,f-14
==> Activation 0          buidarY: f-14
==> Activation 0          buidarX: f-14
==> Activation 0          omplirY: f-2,f-14
==> f-15      (aig X 2 Y 0)
==> Activation 0          obj: f-15
==> Activation 0          buidarXenY: f-2,f-15
==> Activation 0          buidarX: f-15
==> Activation 0          omplirY: f-2,f-15
==> Activation 0          omplirX: f-1,f-15
==> f-16      (aig X 2 Y 3)
==> Activation 0          obj: f-16
==> Activation 0          omplirXdesdY: f-1,f-16
==> Activation 0          buidarY: f-16
==> Activation 0          buidarX: f-16
==> Activation 0          omplirX: f-1,f-16
Solucio trobada!
CLIPS>

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oX = omplirX
 oY = omplirY
 bX = buidarX
 bY = buidarY
 oXdY = omplirXdesdY
 oYdX = omplirYdesdX
 bXeY = buidarXenY
 bYeX = buidarYenX
 obj = obj



Pitxers d'aigua: traça simplificada

