

```
1 ;Samedi 6 Avril 2002 11:32:38 file : burstall.vlisp ;
2
3 ;----- micro verifieur de preuves par induction;
4 ;   de proprietes de programmes lisp (TRES pur);
5 ;                               d'apres pg;
6
7 (lib evalsym.vlisp)
8
9 (df theo (l) theo
10 (prove l 0))
11
12 ; ex: (theo (p m n) = (p n m));
13
14 (de prove (th n ;; thh) prove
15 ; th = (* = **);
16 (pstar (nconc [n 'prove] th))
17 (cond
18 ((eq (setq thh (reduce th)) t))
19 ((equal th thh) (command))
20 (t (prove thh (1+ n))))
21 (pstar [n 'proved]))
22
23 (de pstar (l) pstar
24 (prin1 '**) (apply 'print l))
25
26 (de command (;; com pat remp nboc) command
27 (print "command ?")
28 (setq com (read))
29 (selectq (car com)
30 (induct
31 (cond
32 ((eq (cadr com) 'list) (listinduct (caddr com) th))
33 ((eq (cadr com) 'num) (numinduct (caddr com) th))
34 (t (print "wrong type") (command))))
35 (indhyp
36 (setq nboc (cadr com))
37 (if (eq (caddr com) '->)
38 (setq pat (car ih) remp (caddr ih))
39 (setq pat (caddr ih) remp (car ih)))
40 (prove (useindhyp th) (1+ n)))
41 (gen
42 (prove
43 (let ((th th) (lsub (cdr com)))
44 (if lsub (self (subst (nextl lsub) (nextl lsub) th) lsub) th)) (1+ n)))
45 (look (print (eval (cadr com))) (command))
46 (t (print "unknown command") (command))))
47
48 (de reduce (thh ;; x y) reduce
49 (setq x (symeval (car thh) nil) y (symeval (caddr thh) nil))
50 (pstar ['reduit 'a x '= y])
51 (or (equal x y) [x '= y]))
52
53
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```
(de listinduct (var ih) listinduct
54 ; ih = hypothese d'induction;
55 (pstar ['base])
56 (prove (subst nil var ih) (1+ n))
57 (pstar ['step])
58 (prove (subst ['cons (gensym) var] var ih) (1+ n)))
59
60 (de numinduct (var ih) numinduct
61 (pstar ['base])
62 (prove (subst 0 var ih) (1+ n))
63 (pstar ['step])
64 (prove (subst ['1+ var] var ih) (1+ n)))
65
66 (de useindhyp (th) useindhyp
67 (cond
68 ((atom th) (if (neq th pat) th (decr nboc) (if (= nboc 0) remp th)))
69 ((equal th pat)
70 (decr nboc)
71 (if (= nboc 0) remp [(useindhyp (nextl th)) . (useindhyp th)]))
72 (t [(useindhyp (nextl th)) . (useindhyp th)]))
73
74
```

Cross Reference

command de 26
listinduct de 53
numinduct de 60
prove de 14
pstar de 23
reduce de 48
theo df 9
useindhyp de 66

1	->	37
2	a	50
3	base	55 61
4	com	26 28 29 32 32 33 33 36 37 43 45
5	command	19 26 34 45 46
6	evalsym.vlisp	7
7	gen	41
8	ih	38 38 39 39 53 56 58 60 62 64
9	indhyp	35
10	induct	30
11	l	9 10 23 24
12	listinduct	32 53
13	look	45
14	lsub	43 44 44 44 44
15	n	14 16 20 21 40 44 56 58 62 64
16	nboc	26 36 68 68 70 71
17	num	33
18	numinduct	33 60
19	pat	26 38 39 68 69

20	prove	10 14 16 20 40 42 56 58 62 64
21	proved	21
22	pstar	16 21 23 50 55 57 61 63
23	reduce	18 48
24	reduit	50
25	remp	26 38 39 68 71
26	symeval	49 49
27	th	14 16 18 19 32 33 40 43 43 44 44 66 68 68 68 68 69 71 71 72 72
28	theo	9
29	thh	14 18 19 20 48 49 49
30	useindhyp	40 66 71 71 72 72
31	x	48 49 50 51 51
32	y	48 49 50 51 51

;Samedi 6 Avril 2002 11:32:38 end of file : burstall.vlisp ;