lib/basic/maps.ath

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```
(define empty-map [])
   (define (add-binding x y map)
     (add [x y] map))
  (define (extend map pairs)
     (match pairs
       ([] map)
        ((list-of [x y] more) (extend (add-binding x y map) more))))
11
  (define (remove-binding x map)
12
13
     (match map
       ([] [])
14
15
        ((list-of [key value] more) (check ((equal? key x) more)
                                                  (else (add-binding key value (remove-binding x more))))))
16
17
   (define (apply-map map x)
19
     (match map
       ([] ())
20
       ((list-of [a b] more) (check ((equal? a x) b)
21
22
                                         (else (apply-map more x))))))
24 (define (dom m)
    (letrec ((loop (lambda (m res)
                         (match m
26
                           ([] res)
27
                             ((\textbf{list-of} \ [\texttt{a} \ \texttt{b}] \ \texttt{more}) \ (\textbf{check} \ ((\texttt{member}? \ \texttt{a} \ \texttt{res}) \ (\texttt{loop} \ \texttt{more} \ \texttt{res})) 
                                                              (else (loop more (add a res)))))))))
29
       (loop m [])))
31
   (define (map-range m)
33
    (map (lambda (x) (apply-map m x))
          (dom m)))
37 (define (dom-range-list m)
    (map (lambda (x) [x (apply-map m x)])
           (dom m)))
40
41
42 (define (in-dom? a m)
    (match m
43
      ([] false)
       ((list-of [x _] rest) (|| (equal? a x)
45
                                      (in-dom? a rest)))))
```