PROTO\_vEB\_MAXIMUM(*V*)

1. **if** *V.u* == 2
2. **if** *V.A*[1] == 1
3. **return** 1
4. **elseif** *V.A*[0] == 1
5. **return** 0
6. **else**
7. **return** NIL
8. **else**
9. *max\_cluster* = PROTO-vEB-MAXIMUM(*V.summary*)
10. **if** *max\_cluster* ==NIL
11. **return** NIL
12. **else**
13. *offset* = PROTO\_vEB\_MINIMUM(*V.cluster*[*max\_cluster*])
14. **return** *index*(*max\_cluster*, *offset*)

PROTO\_vEB\_PREDECESSOR(*V*, *x*)

1. **if** *V.u*==2
2. **if** *x* == 1 && *V.A*[0] == 1
3. **return** 0
4. **else**
5. **return** NIL
6. **else**
7. *offset* = PROTO\_vEB\_PREDECESSOR(*V.cluster*[*high*(*x*)], *low*(*x*))
8. **if** *offset* != NIL
9. **return** *index*(*high*(*x*), *offest*)
10. **else**
11. *pred\_cluster* = PROTO\_vEB\_PREDECESSOR(*V.summary*, *high*(*x*))
12. **if** *pred\_cluster* == NIL
13. **return** NIL
14. **else**
15. *offset* = PROTO\_vEB\_MAXIMUM(*V.cluster*[*pred\_cluster*])
16. **return** *index*(*succ\_cluster*, *offset*)

PROTO\_vEB\_DELETE(*V*, *x*)

1. **if** *V.u* == 2
2. *V.*A[*x*] = 0
3. *isEmpty* = 0
4. **for** *i* = 1 to 2
5. *isEmpty* = *isEmpty* || A[*i*]
6. **return** !*isEmpty*
7. **else**
8. *isEmpty* = PROTO\_vEB\_DELETE(*V.cluster*[*high*(*x*)], *low*(*x*))
9. **if** *isEmpty* == 1
10. *isEpmty* = PROTO\_vEB\_DELETE(*V.summary*, *high*(*x*))
11. **return** *isEmpty*

PROTO\_vEB\_DELETE(*V*, *x*)

1. **if** *V.u* == 2
2. *V.A*[*x*] = 0
3. **else**
4. PROTO\_vEB\_DELETE(*V.cluster*[*high*(*x*)], *low*(*x*))
5. *inCluster* = *false*
6. **for** *i* = *high*(*x*)·√*u* to (*high*(*x*) + 1)·√*u* − 1
7. **if** PROTO\_vEB\_MEMBER(*V.cluster*[*high*(*x*)], *low*(*i*))
8. *inCluster* = *true*
9. **break**
10. **if** *inCluster* == *false*
11. PROTO\_vEB\_DELETE(*V.summary*, *high*(*x*))