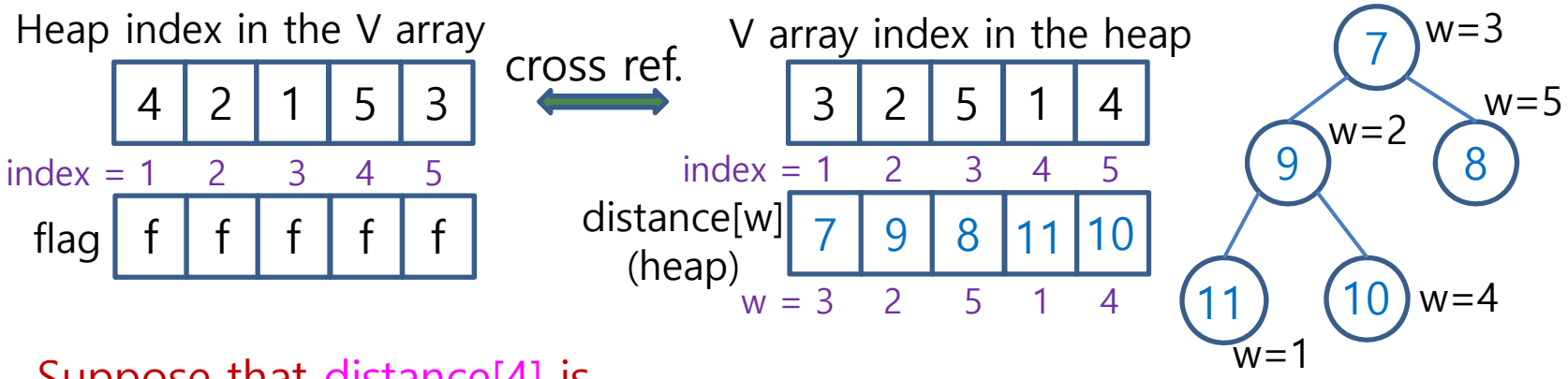
Heap Operations for Dijkstra

- Need Cross Reference between the Vertex and Heap Arrays.
- Heap Update Example

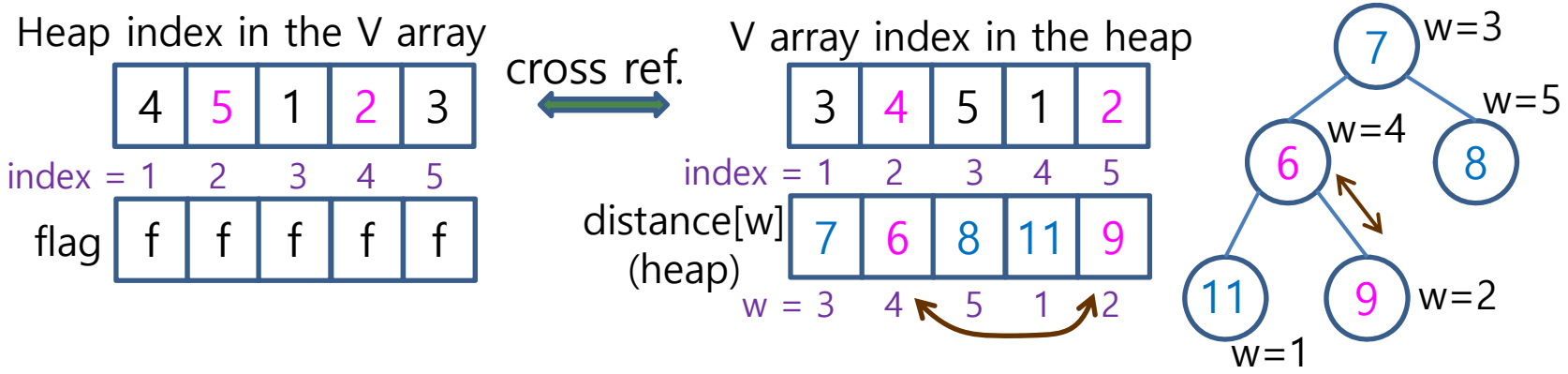
Heap_size = 5



Suppose that distance[4] is changed from 10 to 6

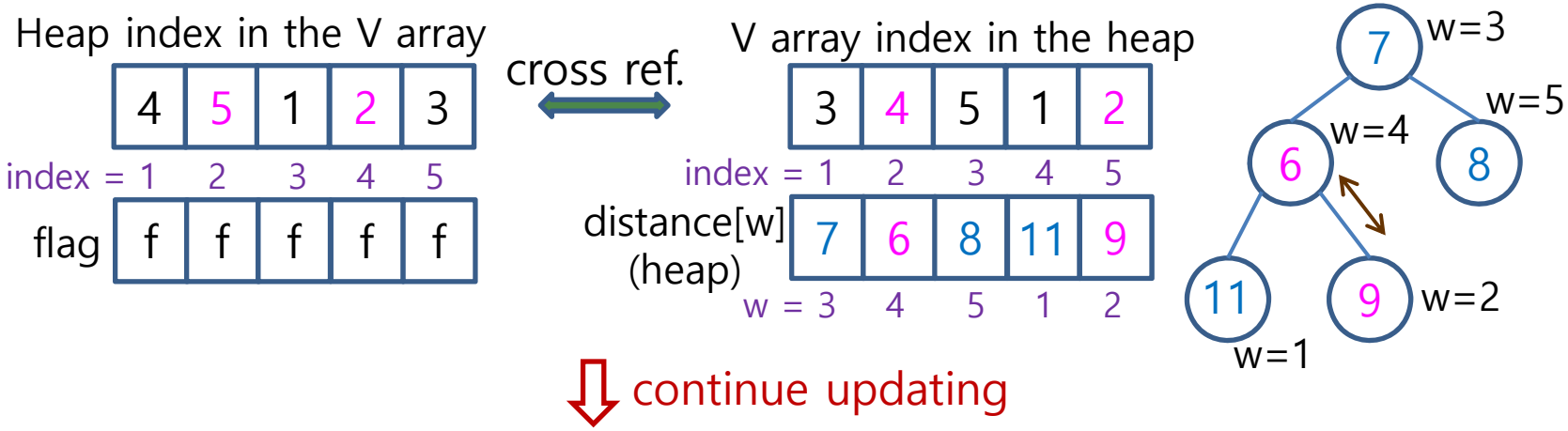
⇩ update the heap

(1) Exchange distance[4] and distance[2]



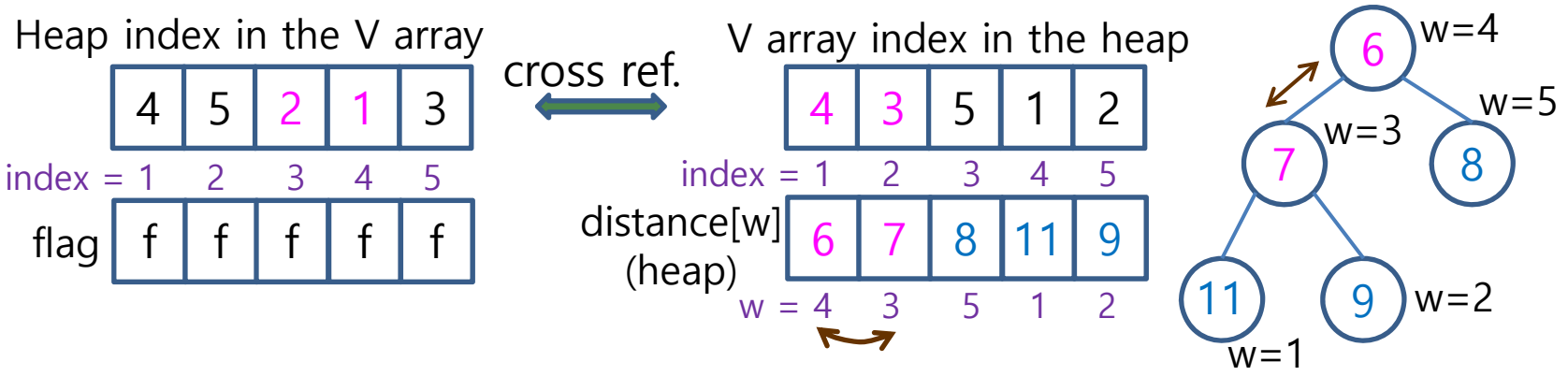
✦Heap Update Example(cont'd)

(1) Exchange distance[4] and distance[2]



⇩ continue updating

(2) Exchange distance[4] and distance[3]



✦Delete Min Example

Heap_size = 5

(1) Exchange distance[4] and distance[2]

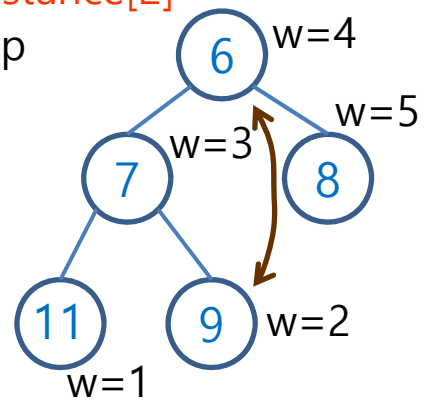
Heap index in the V array

	1	2	3	4	5
	4	5	2	1	3
flag	f	f	f	f	f

cross ref.

V array index in the heap

	1	2	3	4	5
	4	3	5	1	2
distance[w] (heap)	6	7	8	11	9
w =	4	3	5	1	2



(2) Exchange distance[2] and distance[3]

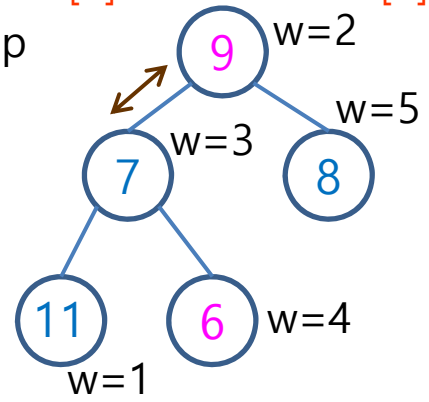
Heap index in the V array

	1	2	3	4	5
	4	1	2	5	3
flag	f	f	f	T	f

cross ref.

V array index in the heap

	1	2	3	4	5
	2	3	5	1	4
distance[w] (heap)	9	7	8	11	6
w =	2	3	5	1	4



Heap_size = 4

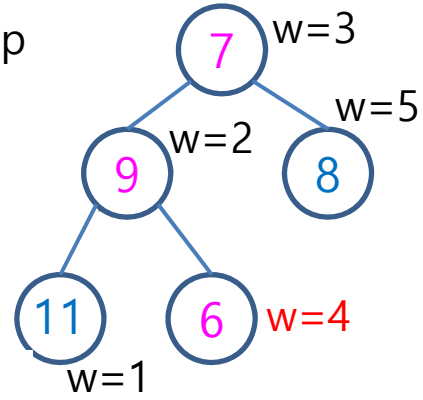
Heap index in the V array

	1	2	3	4	5
	4	2	1	5	3
flag	f	f	f	T	f

cross ref.

V array index in the heap

	1	2	3	4	5
	3	2	5	1	4
distance[w] (heap)	7	9	8	11	6
w =	3	2	5	1	4



distance[4] must still be in the heap array even if it was deleted from the heap.