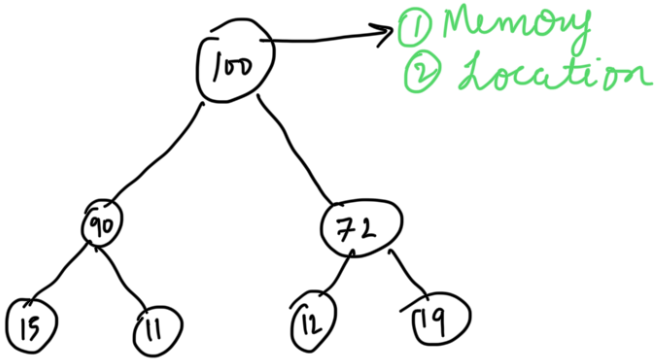
Free Memory Management System

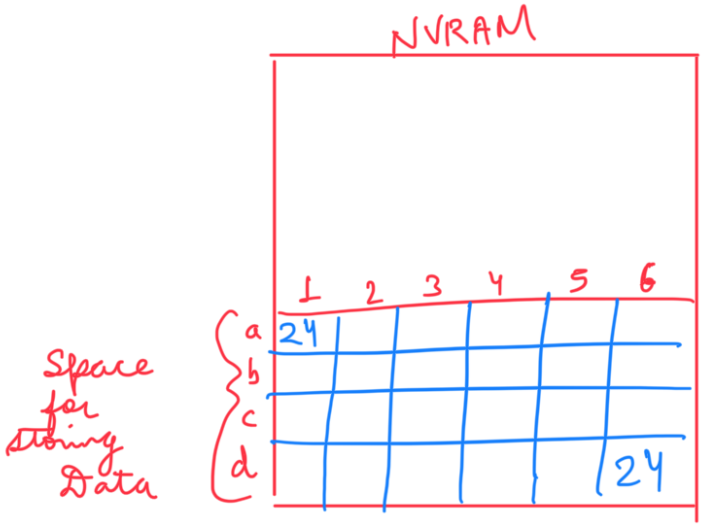
⇒ components : ① Heap
② Prefix Sum and heap pointer storing in NVRAM

Max Heap



Time Complexities for Structure

① Insert : O(log(N))
② Delete : O(log(N))
③ Increase Key : O(log(N))

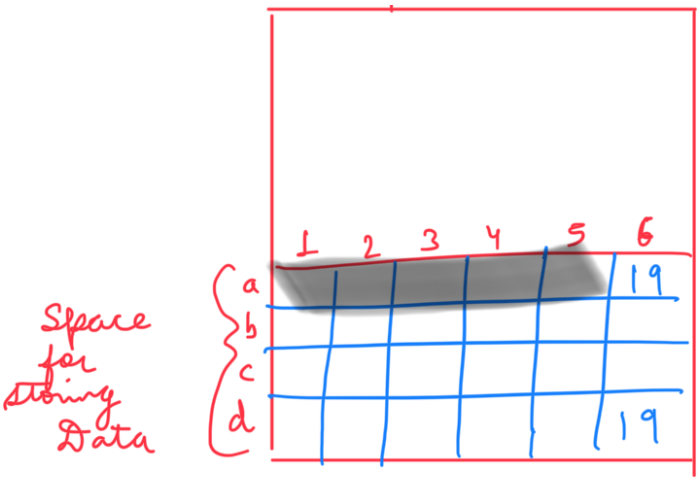


① Initial Heap

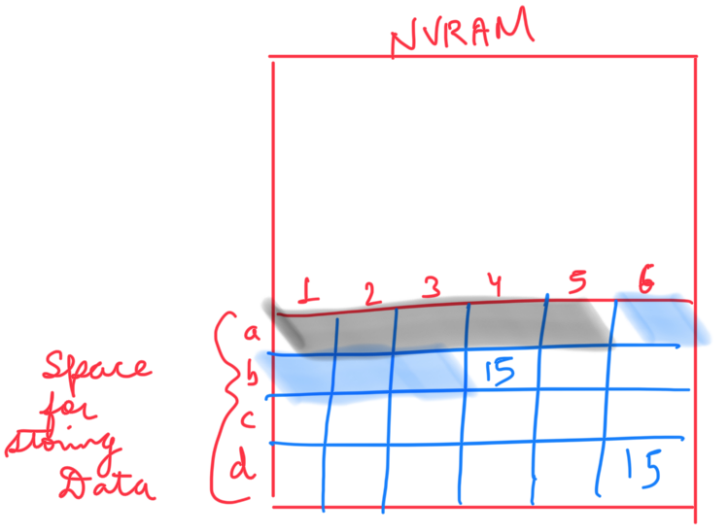
② System asks for 5 units of storage.

NVRAM

③ heap



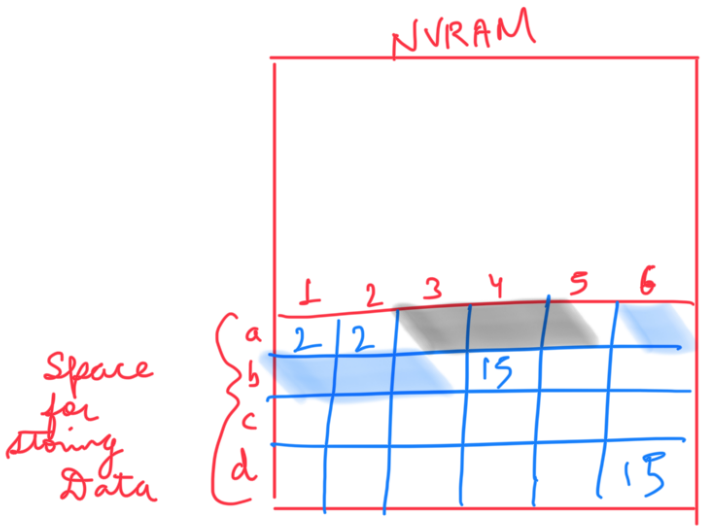
19
a6



(4) System asks 4 units

Heap

15
b4



(5) Free 2 unit from a1

Heap

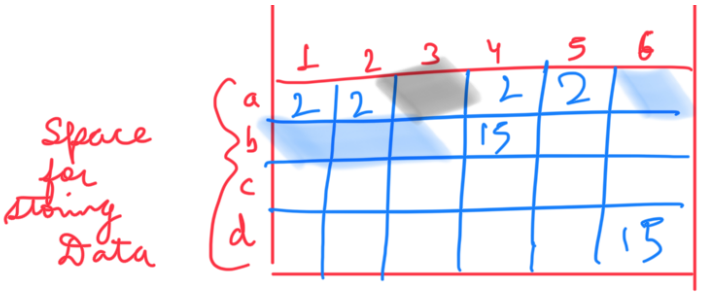
15
b4

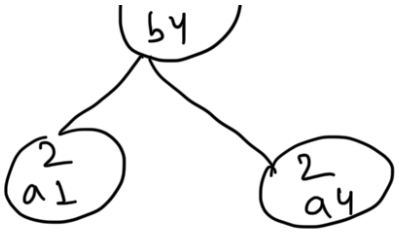
2
a1

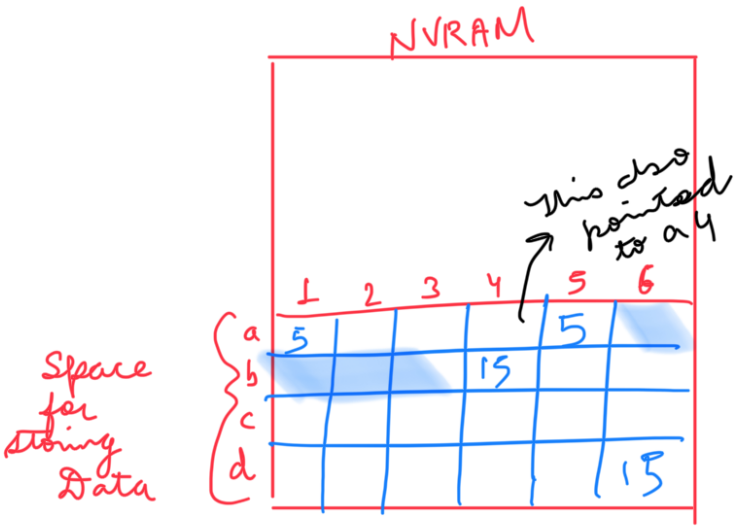
(6) Free 2 units from a4

Heap

15







Hence instead of garbage value we can store something useful to operate.

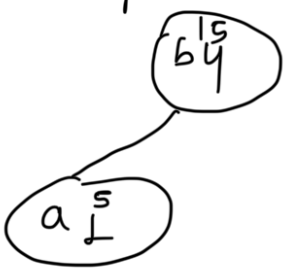
(7) Free 1 unit at a3

→ Check left and right for free memory and merge them and delete the entry from heap.

→ a1 will increase to 5

→ a4 entry will be deleated.

Heap



Multiple heaps can be used