

CM-17

DAA-HW-12

1a) To insert  $n$  elements using aggregate method  
Cost of  $i^{th}$  operation.

Case 1: If we don't take need to allocate new memory  $= O(1)$

Case 2: If we allocate new memory

$$P = 2^k + 1 \quad k \geq 2$$

to include the capacity and double the size of array

$\therefore$  we need to allocate new memory.  
Copy over  $2^k$  numbers from old to new array and insert new numbers

Running Time  $\approx 2^k + 1$  if  $i \geq 2^k$  Case 1  
Otherwise Case 2

1b) Accounting method

The operations which cause capacity to include are expensive

$P$  1 2 3 4 5

$t(i)$  1 2 3 1 5

When size is changed from 4 to 5; the size is doubled and numbers are copied from old to new one

$\therefore$  No of consecutive in  $t(i) = 2^k + 1 - (2^{k-1} + 1) - 1 = (n) 2^{k-1} - 1$

$$\approx \frac{2^k + 1}{2^{k-1} + 1} \approx 2 \quad \text{if } k = \text{large}$$