DESIGN AND ANALYSIS OF ALGORITHMS

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1)a) To insert 'n' elements using Aggregate method

cost of ith operation

case 1 : if we ~~didn't~~ don't take need to allocate new
memory $= O(1)$

case 2 : if we allocate new memory

$$i = 2^k + 1 \qquad K = 1, 2. \cdots$$

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 number

Running Time $= 2^k + 1 \qquad$ if $\quad i = 2^k + 1 \quad$ case 1

$\qquad\qquad\qquad 1 \qquad\qquad$ otherwise case 2.

1b) Accounting method

The operations which cause capacity to include are expensive

i	1	2	3	4	5
$t(i)$	1	2	3	~~4~~ 1	5

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

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

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