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Hands On 11

Q.2.2

(a) In the aggregate method ~~is the~~ we consider the total cost across all the ~~interactions~~ insertions and calc. the avg. cost per insertion. When inserting the i^{th} element, if a resize ~~opti~~ operation is not needed the existing cost(i) as it involves ~~copyi~~ copying the existing elements to the new table of 2^k (k is the no. of resizes performed).

Total cost = $O(n \log n)$

Cost per insertion = $O(\log n)$

~~Total Time~~

Runtime per insertion = $O(\log n)$

Total time = $O(n) \times \log(n+1)$

(b) Accounting method: In this method, we assign each insertion a higher ~~cost~~ cost to store credits that pay for future resizing costs.

Psudo Code:

```
for i=1
    If the table is full
        new table = Create new table
        with size then copy elements
        from old table to new table
        table = new table
    Insert element 'i' into table
    initial charge = 0
```

for i=1 to n
    charge =2
    If table doubled in size
        into 2m
    credits = m

total charges = 2*n = O(n)
total credits = m+2m ... $\frac{n}{2}$ x m = O(n)

Amortized cost per insertion = total/n
= $\frac{O(n)}{n}$
= O(1)