

Name: Tirth M. Patel
student ID: 1002252509

chap = 17.

a) Aggregate Method

Initially table with capacity = 1

for $i = 1$ to n

if table is full

1. new table = create new table with size
2. current size copy element from
old table to new table

table = new table

insert element in inter table

let $k = \log(n+1) - 1$

$$\begin{aligned} \text{Total cost} &= O(n) * k \\ &= O(n \log n) \end{aligned}$$

cost per insertion is $O(\log n)$

Total time is $O(n) \log(n+1)$

b) Accounting Method

Initialize table with capacity = 1

for $i = 1$ to n

if table is full

new table = create new table with size
current size

copy element from old table to new table

table = new table
insert element i into
initialize charges = 0
initialize credits = 0
for $i = 1$ to n
charges is = 2

if table doubled is size from n to $2n$

$$\text{credits is} = m$$
$$\text{Total charges} = 2n = O(n)$$

$$\text{Total credits} = m + 2m + \dots \frac{n}{2} m = O(n^2)$$

$$\begin{aligned}\text{cost per insertion} &= \text{Total} / n \\ &= O(n/n) \\ &= O(1)\end{aligned}$$

$$\boxed{\text{Runtime per insertion} = O(1)}$$

$$\boxed{\text{Total time} = O(n)}$$