Data Structures: Chapter 7 Homework

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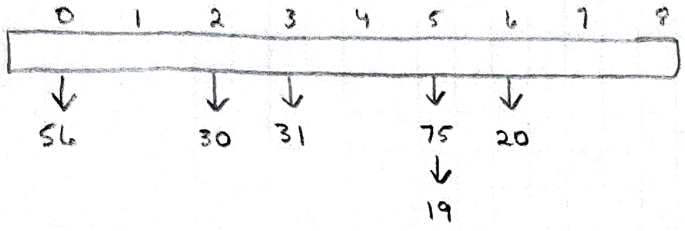
(Open)

1) 30, 20, 56, 75, 31, 19 Hash function $h(k) = k \bmod 7$

a) Construct Open Hash Table:

$h(30) = 2$, $h(20) = 6$, $h(56) = 0$
$h(75) = 5$, $h(31) = 3$, $h(19) = 5$




b) Largest number of Comparisons: = key: 19, 2

| key: | 30 | 20 | 56 | 75 | 31 | 19 |
|---|---|---|---|---|---|---|
| Comp.: | 1 | 1 | 1 | 1 | 1 | 2 |

c) Average number of Comparisons:

$\Rightarrow \frac{1+1+1+1+1+2}{6}$ = Avg. Comp: $\frac{7}{6}$ or 1.167

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(Closed)

2) 30, 20, 56, 75, 31, 19 Hash function $h(k) = k \bmod 7$

a) Construct Closed Hash Table:

| | 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|---|
| i=1 | | | 30 | 1 | | 75 | 19 | | |
| 2 | | | 30 | | | | 20 | | |
| 3 | 56 | | 30 | | | | 20 | | |
| 4 | 56 | | 30 | | | 75 | 20 | | |
| 5 | 56 | | 30 | 31 | | 75 | 20 | | |
| 6 | 56 | | 30 | 31 | | 75 | 20 | 19 | |

b) Largest number of Comparisons is: = key = 19, 6

c) Averge number of Comparisons:

$\Rightarrow 1/6 \cdot 1 + 1/6 \cdot 1 + 1/6 \cdot 1 + 1/6 \cdot 2 + 1/6 \cdot 3 + 1/6 \cdot 6 =$ $\frac{14}{6}$ or 2.3