Homework 11

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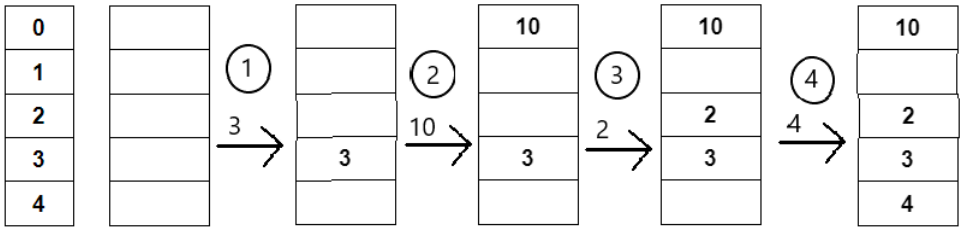
Homework 11.1:
a)
the double-hashing strategy for open addressing to store the sequence in the given order in a hash table of size m = 5 with hash functions $h_1(k)$ = k mod 5 and $h_2(k)$ = 7k mod 8, for the sequence 3, 10, 2, 4

1^{st} step:
for input 3, $h_1(3) = 3 \bmod 5 = 3$, since the position 3 is not set yet, there is no need to use the second hash function, 3 is placed at the position 3 of the hash table.

2^{nd} step:
for input 10, $h_1(10) = 10 \bmod 5 = 0$, since the position 0 is not set yet, there is no need to use the second hash function, 10 is placed at the position 0 of the hash table.

3^{rd} step:
for input 2, $h_1(2) = 2 \bmod 5 = 2$, since the position 2 is not set yet, there is no need to use the second hash function, 2 is placed at the position 3 of the hash table.

4^{th} step:
for input 4, $h_4 = 4 \bmod 5 = 4$, since the position 4 is not set yet, there is no need to use the second hash function, 4 is placed at the position 4 of the hash table.



There was no collision, we therefore didn't have to use the second hash function.

b) a11.cpp

Homework 11.2:
a)Show that a greedy algorithm for the activity-selection problem that makes the greedy choice of selecting the activity with shortest duration may fail at producing a globally optimal solution.

In order to show that producing an optimal solution may fail, we need to find an example that fails when applying to it the greedy algorithm.
let's take I is [[2, 7], [5, 9], [7, 14]], with $\|I\| = 3$.

The solution that the greedy algorithm is s: $[[5, 9]]$, no other activity can be added to it. This solution is wring since the optimal solution is s' : $[[2, 7], [7, 14]]$.

b)*a*11.*cpp*