

Assignment 9

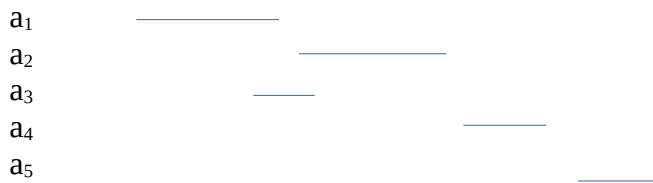
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Problem 9.1

a) We have the sequence 3, 10, 2, 4 that we will apply double hashing to. For the first element $k = 3$, $h_1(3) = 3 \bmod 5$ so element three will be put in position 3 in the hash table. For $k = 10$, $h_1(10) = 0 \bmod 5$ so 10 is placed in position 0 in the table, still no collision. For $k = 2$, $h_1(2) = 2 \bmod 5$ so element 2 will be placed in position 2 of the table, still no collision. For $k = 4$, $h_1(4) = 4 \bmod 5$ so 4 will be placed in position 4 in the table, still no collision. The table of size 5 will be $[_{10}___2__3__4__]$ and we have no collisions at all so we never use $h_2(k)$.

Problem 9.2

a) To show this it suffices to find an example in which this greedy choice will not lead to a global solution. Take the following activities represented by a line as in the example in class:



Using this greedy choice we would end up choosing the activities $a_3, a_4,$ and a_5 , while the globally optimal solution would be $a_1, a_2, a_4,$ and a_5 . Thus the greedy choice of choosing always the activity with shortest duration may fail to produce a globally optimal solution.

b) Please find the code for this exercise and the hashTable implementation in the folder.