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:

a_1 ——————
a_2 ——————
a_3 ——
a_4 ——————
a_5 ——————

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.