

CPSC 131 Homework 8

Deadline: Monday, December 10 (MoWe sections)
Tuesday, December 11 (TuTh sections)

Turn in your submission as a hard copy in class. Refer to your instructor's syllabus addendum to see their policy on group work. Some instructors allow homework to be completed in groups.

#1 [3 points]

Sketch a hash table of size $N=10$, where the hash function is $\text{hash}(\text{key}) = \text{key} \bmod N$ and *chaining* is used to resolve collisions, after the following elements are inserted:

20, 42, 45, 49, 62, 72, 95

T										
	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]

#2 [3 points]

Sketch a hash table of size $N=10$, where the hash function is $\text{hash}(\text{key}) = \text{key} \bmod N$ and *linear probing* is used to resolve collisions, after the following elements are inserted:

20, 42, 45, 49, 62, 72, 95

T										
	[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]

#3 [3 points]

Sketch a hash table of size $N=10$, where the hash function is $\text{hash}(\text{key}) = \text{key} \bmod N$ and *quadratic probing* is used to resolve collisions, after the following elements are inserted:

20, 42, 45, 49, 62, 72, 95.

The probes are based on this equation: $(H + c_1 * i + c_2 * i^2) \bmod(N)$ and $c_1=1$, $c_2=1$.

T

[0]	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]	[9]

#4 [1 point]

If *direct hashing* was used to store the same elements in the previous problems (20, 42, 45, 49, 62, 72, 95), what should be the minimum size of the hash table?