

CS202: HW6C

Answer Key

November 8, 2011

HW5C1 Tables

Search for the given key.

Key = 51

loop#	idx	itm	gt?	lo	hi	ke idx
1	9	200	1	1	8	0
2	5	88	1	1	4	0
3	3	28	0	4	4	0
4	4	51	0	4	4	4

Key = 364

loop#	idx	itm	gt?	lo	hi	ke idx
1	9	200	0	10	16	0
2	13	280	0	14	16	0
3	15	364	0	14	16	15

Key = 166

loop#	idx	itm	gt?	lo	hi	ke idx
1	9	200	1	1	8	0
2	5	88	0	6	8	0
3	7	113	0	8	8	0
4	8	166	0	8	8	8

Key = 20

loop#	idx	itm	gt?	lo	hi	ke idx
1	9	200	1	1	8	0
2	5	88	1	1	4	0
3	3	28	1	1	2	0
4	2	10	0	3	2	0

HW5C2 Complexity

This binary search for N we can see that;

$$\text{Guesses} \leq \lfloor \log_2 N + 1 \rfloor$$

So, for,

$$N = 16 \text{ Max Guesses} = 5 \text{ (or 4)}$$

$$N = 64 \text{ Max Guesses} = 7 \text{ (or 6)}$$

$$N = 512 \text{ Max Guesses} = 10 \text{ (or 9)}$$

$$N = 4096 \text{ Max Guesses} = 13 \text{ (or 12)}$$

$$N = 16384 \text{ Max Guesses} = 15 \text{ (or 14)}$$