

Submission Questions

1. Based on the following truncation, write the hash function for the key: **5247613**

- a) Truncate the last two digits
 $5247613 / 100 = 52476.13$

Last 2 Digits
13

ANS : 52476

- b) Truncate the first three digits
 $5247613 / 1000 = 5247.613$
First 3 Digits
524

ANS : 7.613

- c) Truncate the first two digits and the last two digits
 $5247613 / 100 = 52476.13$

First 2 digits
52

Last 2 digits
13

ANS : 476

2. Assume a hash table with 6 locations and the hashing function $h(x) = x \% 6$. Show the index for each key and the result of the hash table when the following integers are inserted in the order given.

22, 47, 53, 69, 73, 85

a) linear probing

Index	0	1	2	3	4	5
Key	53	73	85	69	22	47

- $22 - 22 / 6 * 6 = 4$
- $47 - 47 / 6 * 6 = 5$
- $53 - 53 / 6 * 6 = 5$ (HIT) - GO to Index 0 as next available slot
- $69 - 69 / 6 * 6 = 3$
- $73 - 73 / 6 * 6 = 1$
- $85 - 85 / 6 * 6 = 1$ (HIT) - GO to index 2 as next available slot

b) quadratic probing

Index	0	1	2	3	4	5
Key	53	73	85	69	22	47

- $22 - 22 / 6 * 6 = 4$
- $47 - 47 / 6 * 6 = 5$
- $69 - 69 / 6 * 6 = 3$
- $73 - 73 / 6 * 6 = 1$
- $53 - 53 / 6 * 6 = 5$ (HIT)

Since hit, quadratic probing

$$0^2 = (5+0) / 6$$

$$5 - 5 / 6 * 6 = 5 \text{ (HIT)}$$

$$1^2 = (5+1) / 6$$

$$6 - 6 / 6 * 6 = 0$$

$$85 - 85 / 6 * 6 = 1 \text{ (HIT)}$$

$$0^2 = (1+0) / 6$$

$$1 - 1 / 6 * 6 = 1 \text{ (HIT)}$$

$$1^2 = (1+1) / 6$$

$$2 - 2 / 6 * 6 = 2$$

c) Chaining

Index	0	1	2	3	4	5
Key	53	73	85	69	22	47
Chain		85				53

- $22-22 / 6*6 = 4$
- $47-47 / 6*6 = 5$
- $53-53 / 6*6 = 5$ (HIT)
- $69-69 / 6*6 = 3$
- $73-73 / 6*6 = 1$
- $85-85 / 6*6 = 1$ (HIT)