

Data Structure (Tutorial - 6)

Ans 1. Given arr[] = (54, 26, 93, 17, 77, 31, 44, 55, 20)
hash table (size - 11)

(i) $54 \% 11 = 10$

(ii) $26 \% 11 = 4$

(iii) $93 \% 11 = 5$

(iv) $17 \% 11 = 6$

(v) $77 \% 11 = 0$

(vi) $31 \% 11 = 9$

(vii) $44 \% 11 = 0$ next 1

(viii) $55 \% 11 = 0$ next 2

(ix) $20 \% 11 = 9$ vacant 3

0	77
1	44
2	55
3	20
4	26
5	93
6	17
7	
8	
9	31
10	54

Ans 2. $27 \% 13 = 1$ $\therefore (C) 1, 0$
 $130 \% 13 = 0$

Ans 3. (i) $113 \% 11 = 3$

(ii) $117 \% 11 = 7$

(iii) $97 \% 11 = 9$

(iv) $100 \% 11 = 1$

(v) $114 \% 11 = 4$

(vi) $108 \% 11 = 9 \rightarrow 10$

(vii) $116 \% 11 = 6$

(viii) $105 \% 11 = 6 \rightarrow 7 \rightarrow 8$

(ix) $99 \% 11 = 0$

0	1	2	3	4	5	6	7
99, 100, —	—	113, 114, —	116, 117, —	—	—	—	—
8	9	10	—	—	—	—	—
105, 97, 108	—	—	—	—	—	—	—

$\therefore (B)$

Ans 4. This function is performing the function of generating hash keys for string values for hash table size 6.

for ex: abcd (string)

$$h = 2 * 97 + 98 + 3 * 99 = 194 + 98 + 297 = 589$$

will return $h \% 6$ i.e. $589 \% 6 = 1$ (hash key)

Ans 5. I \rightarrow (4, 5, 15, 20), 25 (search) Size = 10



$$4 \% 10 = 4$$

$$5 \% 10 = 5$$

$$15 \% 10 = 5 \rightarrow 6$$

$$20 \% 10 = 0$$

Searching 25 (will check $25 \% 10 = 5$)

not found as 15 is there

next check 6 still not found

next check at empty return "not found";

I \rightarrow (10, 44, 35, 89, 85) & D \rightarrow 89

$$10 \% 10 = 0 \rightarrow 1$$

$$44 \% 10 = 4 \rightarrow 5 \rightarrow 6 \rightarrow 7$$

$$35 \% 10 = 5 \rightarrow 6 \rightarrow 7 \rightarrow 8$$

$$89 \% 10 = 9$$

$$85 \% 10 = 5 \rightarrow 6 \rightarrow 7 \rightarrow 8 \rightarrow 9 \rightarrow 0 \rightarrow 1 \rightarrow 2$$

D(89) = $89 \% 10 = 9$ (will found at 89 & remove it)

I(19) & D(35) = $19 \% 10 = 9$

D(35) = $35 \% 10 = 5 \rightarrow 6 \rightarrow 7 \rightarrow 8$ (found & empty at 8)

0	1	2	3	4	5	6	7	8	9
20	10	85		4	5	15	44		89

→ hash table