Rajalakshmi Engineering College

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 7_MCQ_Updated

Attempt : 1
Total Mark : 20
Marks Obtained : 17

Section 1 : MCQ

1. Which C statement is correct for finding the next index in linear probing?

Answer

index = (index + 1) % size;

Status : Correct ***Marks : 1/1***

2. Which of the following best describes linear probing in hashing?

Answer

Resolving collisions by linearly searching for the next free slot

Status : Correct ***Marks : 1/1***

3. In linear probing, if a collision occurs at index i, what is the next index checked?

Answer

(i + 1) % table_size

Status : Correct ***Marks : 1/1***

4. What does a deleted slot in linear probing typically contain?

Answer

A special "deleted" marker

Status : Correct ***Marks : 1/1***

5. Which of the following values of 'm' is recommended for the division method in hashing?

Answer

A prime number

Status : Correct ***Marks : 1/1***

6. Which situation causes clustering in linear probing?

Answer

All the mentioned options

Status : Correct ***Marks : 1/1***

7. What is the initial position for a key k in a linear probing hash table?

Answer

k % table_size

Status : Correct ***Marks : 1/1***

8. Which data structure is primarily used in linear probing?

Answer

Array

Status : Correct ***Marks : 1/1***

9. What would be the result of folding 123456 into three parts and summing: (12 + 34 + 56)?

Answer

102

Status : Correct ***Marks : 1/1***

10. Which folding method divides the key into equal parts, reverses some of them, and then adds all parts?

Answer

Folding boundary method

Status : Wrong ***Marks : 0/1***

11. What is the primary disadvantage of linear probing?

Answer

Clustering

Status : Correct ***Marks : 1/1***

12. Which of these hashing methods may result in more uniform distribution with small keys?

Answer

Mid-Square

Status : Correct ***Marks : 1/1***

13. Which of the following statements is TRUE regarding the folding method?

Answer

It divides the key into parts and adds them.

Status : Correct ***Marks : 1/1***

14. In C, how do you calculate the mid-square hash index for a key k, assuming we extract two middle digits and the table size is 100?

Answer

((k * k) / 10) % 100

Status : Wrong ***Marks : 0/1***

15. In division method, if key = 125 and m = 13, what is the hash index?

Answer

8

Status : Correct ***Marks : 1/1***

16. What is the worst-case time complexity for inserting an element in a hash table with linear probing?

Answer

O(n)

Status : Correct ***Marks : 1/1***

17. What happens if we do not use modular arithmetic in linear probing?

Answer

Index goes out of bounds

Status : Correct ***Marks : 1/1***

18. In the folding method, what is the primary reason for reversing alternate parts before addition?

Answer

To reduce the chance of collisions caused by similar digit patterns

Status : Correct ***Marks : 1/1***

19. What is the output of the mid-square method for a key k = 123 if the hash table size is 10 and you extract the middle two digits of k * k?

Answer

5

Status : Wrong ***Marks : 0/1***

20. In the division method of hashing, the hash function is typically written as:

Answer

h(k) = k % m

Status : Correct ***Marks : 1/1***

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 7_COD_Question 1

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Ravi is building a basic hash table to manage student roll numbers for quick lookup. He decides to use Linear Probing to handle collisions.

Implement a hash table using linear probing where:

The hash function is: index = roll_number % table_sizeOn collision, check subsequent indexes (i+1, i+2, ...) until an empty slot is found.

You need to:

Insert a list of n student roll numbers into the hash table.Print the final state of the hash table. If a slot is empty, print -1.

Input Format

The first line of the input contains two integers n and table_size, where n is the

number of roll numbers to be inserted, and table_size is the size of the hash table.

The second line contains n space-separated integers — the roll numbers to insert into the hash table.

Output Format

The output should print a single line with table_size space-separated integers representing the final state of the hash table after all insertions.

If any slot remains unoccupied, it should be represented as -1.

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 4 7
50 700 76 85

Output: 700 50 85 -1 -1 -1 76

Answer

```
#include <stdio.h>

#define MAX 100

// You are using GCC
void initializeTable(int table[], int size)
{
    for (int i = 0; i < size; i++)
    {
        table[i] = -1;
    }
}
int linearProbe(int table[], int size, int num)
{
    int index = num % size;
    while (table[index] != -1)
    {
        index = (index + 1) % size;
    }
```

```
    return index;
}
void insertIntoHashTable(int table[], int size, int arr[], int n)
{
    for (int i = 0; i < n; i++)
    {
        int pos = linearProbe(table, size, arr[i]);
        table[pos] = arr[i];
    }
}
void printTable(int table[], int size)
{
    for (int i = 0; i < size; i++)
    {
        printf("%d ", table[i]);
    }
    printf("\n");
}

int main() {
    int n, table_size;
    scanf("%d %d", &n, &table_size);

    int arr[MAX];
    int table[MAX];

    for (int i = 0; i < n; i++)
        scanf("%d", &arr[i]);

    initializeTable(table, table_size);
    insertIntoHashTable(table, table_size, arr, n);
    printTable(table, table_size);

    return 0;
}
```

Status : Correct ***Marks : 10/10***

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 7_COD_Question 4

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Develop a program using hashing to manage a fruit contest where each fruit is assigned a unique name and a corresponding score. The program should allow the organizer to input the number of fruits and their names with scores.

Then, it should enable them to check if a specific fruit, identified by its name, is part of the contest. If the fruit is registered, the program should display its score; otherwise, it should indicate that it is not included in the contest.

Input Format

The first line consists of an integer N, representing the number of fruits in the contest.

The following N lines contain a string K and an integer V, separated by a space, representing the name and score of each fruit in the contest.

The last line consists of a string T, representing the name of the fruit to search for.

Output Format

If T exists in the dictionary, print "Key "T" exists in the dictionary.".

If T does not exist in the dictionary, print "Key "T" does not exist in the dictionary.".

Refer to the sample outputs for the formatting specifications.

Sample Test Case

Input: 2
banana 2
apple 1
Banana
Output: Key "Banana" does not exist in the dictionary.

Answer

```
// You are using GCC
int keyExists(KeyValuePair* dictionary, int n, char* key_to_search)
{
   for (int i = 0; i < n; i++)
   {
      if (strcmp(dictionary[i].key, key_to_search) == 0)
   {
         return 1;
   }
   }
   return 0;
}
```

Status : Correct ***Marks : 10/10***