Rajalakshmi Engineering College

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NeoColab_REC_CS23231_DATA STRUCTURES

REC_DS using C_Week 7_COD_Question 2

Attempt : 1
Total Mark : 10
Marks Obtained : 10

Section 1 : Coding

1. Problem Statement

Priya is developing a simple student management system. She wants to store roll numbers in a hash table using Linear Probing, and later search for specific roll numbers to check if they exist.

Implement a hash table using linear probing with the following operations:

Insert all roll numbers into the hash table.For a list of query roll numbers, print "Value x: Found" or "Value x: Not Found" depending on whether it exists in the table.

Input Format

The first line contains two integers, n and table_size — the number of roll numbers to insert and the size of the hash table.

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

The third line contains an integer q — the number of queries.

The fourth line contains q space-separated integers — the roll numbers to search for.

Output Format

The output print q lines — for each query value x, print: "Value x: Found" or "Value x: Not Found"

Refer to the sample output for formatting specifications.

Sample Test Case

Input: 5 10
21 31 41 51 61
3
31 60 51

Output: Value 31: Found
Value 60: Not Found
Value 51: Found

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;
   int start=index;
   while(table[index]!=-1){
      index=(index+1)%size;
      if(index==start)
      return -1;
   }
   return index;
}

void insertIntoHashTable(int table[], int size, int arr[], int n) {
   for(int i=0;i<n;i++){
      int index=arr[i]%size;
      if(table[index]==-1){
         table[index]=arr[i];
      }
      else{
         int newindex=linearProbe(table,size,arr[i]);
         if(newindex!=-1){
            table[newindex]=arr[i];
         }
      }
   }
}

int searchInHashTable(int table[], int size, int num) {
   int index=num%size;
   int start=index;
   while(table[index]!=-1){
      if(table[index]==num)
         return -1;
      index=(index+1)%size;
      if(index==start)
         break;

   }
   return 0;
}
int main() {
   int n, table_size;
   scanf("%d %d", &n, &table_size);

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

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

    int q, x;
    scanf("%d", &q);
    for (int i = 0; i < q; i++) {
        scanf("%d", &x);
        if (searchInHashTable(table, table_size, x))
            printf("Value %d: Found\n", x);
        else
            printf("Value %d: Not Found\n", x);
    }

    return 0;
}
```

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