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'''
    Name : Niraj More
    Assignment : 1
    Roll No : SA49
'''

n = int(input("Enter the number of records : "))
hashTable = [[] for i in range(10)]

def linear_probing(val, name, phone) :
    temp = [(name, phone)]
    while hashTable[val] :
        val = (val + 1) % 10
    hashTable[val] = temp
    display_hashTable()

def separate_chaining(val, name, phone) :
    hashTable[val].append((name, phone))
    display_hashTable()

def insert_value(name, phone) :
    val = hashFunction(phone)
    if not hashTable[val] :
        hashTable[val] = [(name, phone)]
    else :
        print("\n***** Collision Occurured *****")
        choice = int(input('1.Linear Probing\n2.Separate Chaining\n'))
        if choice == 1 :
            linear_probing(val, name, phone)
        else :
            separate_chaining(val, name, phone)

def hashFunction(phone) :
    return phone % 10

def display_hashTable() :
    for i in range(10) :
        print(str(i) + "->" + str(hashTable[i]))

def search_number(phone) :
    for i in range(10) :
        for name, num in hashTable[i] :
            if(num == phone) :
                print(f'Found ! : {name}')
                return
    print("Not found")

for i in range(n) :

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name = input("Enter the name : ")
phone = int(input("Enter the phone number : "))
insert_value(name, phone)

print('\nHash Table\n')
display_hashTable()

num = int(input("Enter the number of phone records do you want to search : "))
for i in range(num) :
    phone = int(input("Enter the phone number to be searched : "))
    search_number(phone)

```

Output :

PS C:\Users\hp\OneDrive\Desktop\DSA> python -u "c:\Users\hp\OneDrive\Desktop\DSA\try.py"

Enter the number of records : 6

Enter the name : Niraj

Enter the phone number : 9579531214

Enter the name : Rushikesh

Enter the phone number : 9850350508

Enter the name : Shrikesh

Enter the phone number : 8857094284

***** Collision Occurured *****

1.Linear Probing

2.Separate Chaining

1

0->[]

1->[]

2->[]

3->[]

4->[('Niraj', 9579531214)]

5->[('Shrikesh', 8857094284)]

6->[]

7->[]

8->(['Rushikesh', 9850350508])

9->[]

Enter the name : Rahul

Enter the phone number : 8025469822

Enter the name : Aaryan

Enter the phone number : 9124876578

***** Collision Occurred *****

1.Linear Probing

2.Separate Chaining

2

0->[]

1->[]

2->(['Rahul', 8025469822])

3->[]

4->(['Niraj', 9579531214])

5->(['Shrikesh', 8857094284])

6->[]

7->[]

8->(['Rushikesh', 9850350508), ('Aaryan', 9124876578)]

9->[]

Enter the name : Ajinkya

Enter the phone number : 8766614700

Hash Table

0->(['Ajinkya', 8766614700])

1->[]

2->(['Rahul', 8025469822])

3->[]

4->(['Niraj', 9579531214])

5->(['Shrikesh', 8857094284])

6->[]

7->[]

8->(['Rushikesh', 9850350508), ('Aaryan', 9124876578)]

9->[]

Enter the number of phone records do you want to search : 3

Enter the phone number to be searched : 9579531214

Found ! : Niraj

Enter the phone number to be searched : 873541408920

Not found

Enter the phone number to be searched : 8025469822

Found ! : Rahul

PS C:\Users\hp\OneDrive\Desktop\DSA>