python program hash function

1 message

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```
class Node:
    def __init__(self, key, value):
        self.key = key
        self.value = value
        self.next = None


class HashTable:
    def __init__(self, capacity):
        self.capacity = capacity
        self.size = 0
        self.table = [None] * capacity

    def _hash(self, key):
        return hash(key) % self.capacity

    def insert(self, key, value):
        index = self._hash(key)

        if self.table[index] is None:
            self.table[index] = Node(key, value)
            self.size += 1
        else:
            current = self.table[index]
            while current:
                if current.key == key:
                    current.value = value
                    return
                current = current.next
            new_node = Node(key, value)
            new_node.next = self.table[index]
            self.table[index] = new_node
            self.size += 1

    def search(self, key):
        index = self._hash(key)

        current = self.table[index]
        while current:
            if current.key == key:
                return current.value
            current = current.next

        raise KeyError(key)

    def remove(self, key):
        index = self._hash(key)
```

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            previous = None
            current = self.table[index]

            while current:
                if current.key == key:
                    if previous:
                        previous.next = current.next
                    else:
                        self.table[index] = current.next
                    self.size -= 1
                    return
                previous = current
                current = current.next

            raise KeyError(key)

        def __len__(self):
            return self.size

        def __contains__(self, key):
            try:
                self.search(key)
                return True
            except KeyError:
                return False


    # Driver code
    if __name__ == '__main__':

        # Create a hash table with
        # a capacity of 5
        ht = HashTable(5)

        # Add some key-value pairs
        # to the hash table
        ht.insert("apple", 3)
        ht.insert("banana", 2)
        ht.insert("cherry", 5)

        # Check if the hash table
        # contains a key
        print("apple" in ht)  # True
        print("durian" in ht)  # False

        # Get the value for a key
        print(ht.search("banana"))  # 2

        # Update the value for a key
        ht.insert("banana", 4)
        print(ht.search("banana"))  # 4

        ht.remove("apple")
        # Check the size of the hash table
        print(len(ht))  # 3
```

Output

```
True
False
2
4
3
```