# Mahad Ghauri

233523

DSA Lab Task

#include <iostream>

#include <list>

#include <string>

using namespace **std**;

*// Define the hash table size*

const int TABLE\_SIZE = 10;

*// Define the hash table class*

class **HashTable**

{

private:

*// Array of linked lists to handle collisions*

**list**<**string**> table[TABLE\_SIZE];

*// Hash function to map a word to an index*

    int **hashFunction**(const **string** &word)

    {

        int hashValue = 0;

        for (char ch : word)

        {

            hashValue += ch; *// Sum ASCII values of characters*

        }

        return hashValue % TABLE\_SIZE; *// Use modulo to ensure the index is within table size*

    }

public:

*// Function to insert a word into the hash table*

    void **insert**(const **string** &word)

    {

*//Finding the index to whcih the word is to be inserted at the hash table*

        int index = **hashFunction**(word);

*//Push the word at the specific index of the table found from the hash function*

        table[index].**push\_back**(word);

    }

*// Function to check if a word is in the hash table*

    bool **contains**(const **string** &word)

    {

        int index = **hashFunction**(word);

        for (const **string** &entry : table[index])

        {

            if (entry **==** word)

            {

                return true;

            }

        }

        return false;

    }

};

int **main**()

{

*// Initialize the hash table*

**HashTable** hashTable;

*// Words to be inserted into the hash table*

**string** words[] = {"apple", "banana", "cherry", "dog", "elephant", "frog",

                      "grape", "hat", "ice cream", "jacket"};

*// Insert words into the hash table*

    for (const **string** &word : words)

    {

        hashTable.**insert**(word);

    }

*// Check if the words "apple", "cat", and "frog" are in the dictionary*

**string** checkWords[] = {"apple", "cat", "frog"};

    for (const **string** &word : checkWords)

    {

        if (hashTable.**contains**(word))

        {

            cout **<<** word **<<** " is in the dictionary." **<<** **endl**;

        }

        else

        {

            cout **<<** word **<<** " is not in the dictionary." **<<** **endl**;

        }

    }

    return 0;

}

