Group 20

I. Contribution:

Thu Nguyen: worked on main function, wrote the report

Huy Huynh: worked on main function, did unit tests

Linh Tran: worked on HashTable1D and HashTable2D classes

II. Instructions for Compiling and Running the Program:

- **Required Files**:

  o HashTable1D.h and HashTable1D.cpp (for the first hash table functionality)

  o HashTable2D.h and HashTable2D.cpp (for the second hash table functionality)

  o HW3.cpp (main program logic)

- **Compiling**:

  o Go to **File > New > Project** and create a new **Console App**

  o Add each .h and .cpp file by right clicking the project name in the **Solution Explorer** and selecting **Add > Existing Item...**.

  o For the unit test, the path for reference file may varies depend on users

  o Go to **Build > Build Solution** or press Ctrl + Shift + B.

- **Running the Program**:

  o After building, click **Debug > Start Without Debugging** or press Ctrl + F5 to run the program.

III.   Results analysis:

   According to the test result, we can see that the first hash table requires less spots checked than the second one in both the insert and remove process. It meets our expectation, and it is undeniable that the first harsh table works better.

   For the first hash table, the best ideal situation is with a low load factor and good hash function, but the performance decreases if it works with high load factor and poor hash function.

   For the second hash table can handle moderate load factors well but becomes less efficient when buckets overflow due to high load factors or poor hash distribution.

```
The checked operations in both hash table in 1st insertion are at follow: 51 60
The value 280 was removed.
The value 280 was removed.
The value 959 was removed.
The value 959 was removed.
The value 119 was removed.
The value 119 was removed.
The value 812 was removed.
The value 812 was removed.
The value 420 was removed.
The value 420 was removed.
The value 161 was removed.
The value 161 was removed.
The value 518 was removed.
The value 518 was removed.
The value 595 was removed.
The value 595 was removed.
The value 651 was removed.
The value 651 was removed.
The value 721 was removed.
The value 721 was removed.
The value 994 was removed.
The value 994 was removed.
The value 756 was removed.
The value 756 was removed.
The value 609 was removed.
The value 609 was removed.
The checked operations in both hash table in 1st removal are at follow: 13 14
The value 946 cannot be inserted.
The checked operations in both hash table in 2nd insertion are at follow: 98 111
The value 558 was removed.
The value 558 was removed.
The value 756 was removed.
The value 756 was removed.
The checked operations in both hash table in 2nd removal are at follow: 2 3

D:\A. Thu\0\A UC\Fall 2024\Data structure\Homework\HW3\HW3\x64\Debug\HW3.exe (process 25764) exited with code 0.
Press any key to close this window . . .
```

In this assignment, we utilize AI in debugging the unit test (the unresolved external symbol error) .