

Data Structure Assignment 5

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○ Result Screenshots

```
wun@DESKTOP-1MSRHTB MINGW64 /c/2020-NCKU_DS/HW5_double_hashing_mechanism/code (master)
$ gcc -std=c11 ./*.c -o hw5

wun@DESKTOP-1MSRHTB MINGW64 /c/2020-NCKU_DS/HW5_double_hashing_mechanism/code (master)
$ ./hw5.exe < input0_windows.txt > ans_output0_windows.txt
insert[11]=24 i=0
insert[10]=10 i=0
insert[ 5]=31 i=0
insert[ 4]=56 i=0
insert[ 6]=45 i=0
insert[ 7]=85 i=0
insert[12]=64 i=0
insert[ 8]=8 i=0
insert[ 0]=77 i=2
insert[ 3]=37 i=1
insert[ 2]=2 i=0
insert[ 1]=98 i=1
insert[ 9]=70 i=8

wun@DESKTOP-1MSRHTB MINGW64 /c/2020-NCKU_DS/HW5_double_hashing_mechanism/code (master)
$ diff ./output0_windows.txt ./ans_output0_windows.txt
```

Figure 1 Screenshot of command line

```
ans_output0_windows.txt x
HW5_double_hashing_mechanis
1 0->77
2 1->98
3 2->2
4 3->37
5 4->56
6 5->31
7 6->45
8 7->85
9 8->8
10 9->70
11 10->10
12 11->24
13 12->64
```

Figure 2 Screenshot of output file

○ Program Architecture

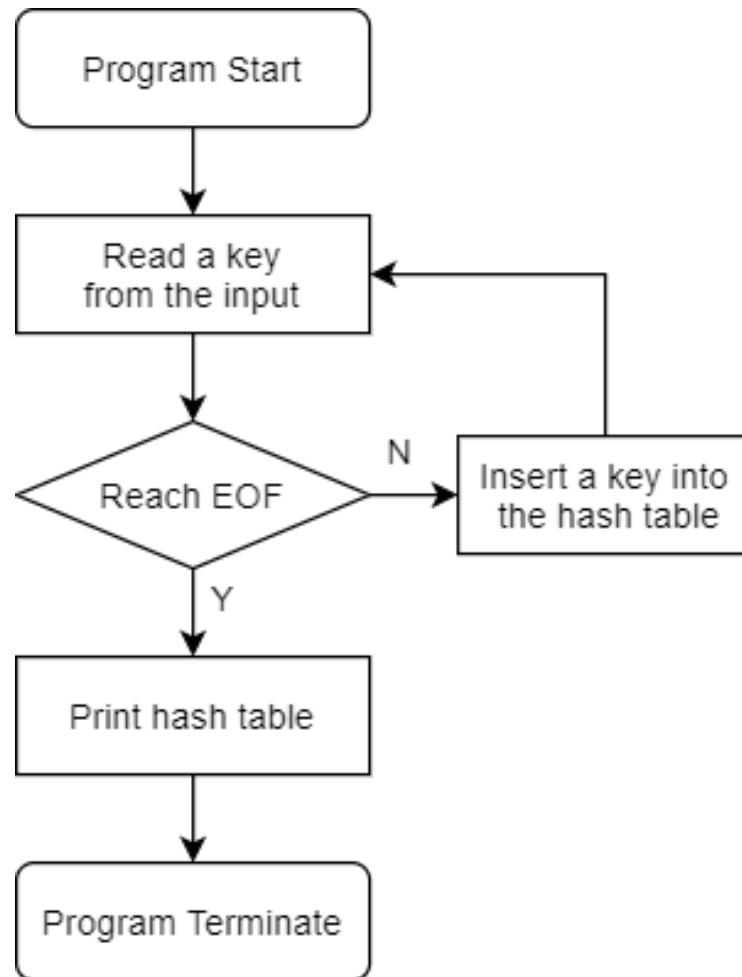


Figure 3 Flow chart of hw5

○ Program Functions

```
int hash(int key, int i)
```

Returns the hash function value.



Parameters

key

The key of the input.

i

The counts of the insertion.



Return Value

Returns the hash function output value.

```
void insert(bucket table[TABLE_SIZE], int key)
```

Inserts the key into the table.



Parameters

table

The input of the hash table.

key

The key that would be inserted.



Return Value

None.

○ Program Design

首先，將 Hash table 的 bucket 定義如下：

```
typedef struct bucket
{
    int key;
    int isFull;
} bucket;
```

為了判斷這個 bucket 是否為空，因此加入 `int isFull` 來判斷。

當 `isFull == 0` 代表為空，

而 `isFull == 1` 代表為滿。

○ Operating System

Windows 10

○ Compiler

gcc.exe (MinGW.org GCC Build-20200227-1) 9.2.0

○ Compile

```
gcc -std=c11 ./*.c -o hw5
```

○ Run

```
./hw5.exe < input.txt > output.txt
```