Data Structure Assignment 5

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○ Result Screenshots

Figure 1 Screenshot of command line

Figure 2 Screenshot of output file

○ **Program Architecture**

Program Start

Read a key
from the input

Reach EOF

N → Insert a key into
the hash table

Y
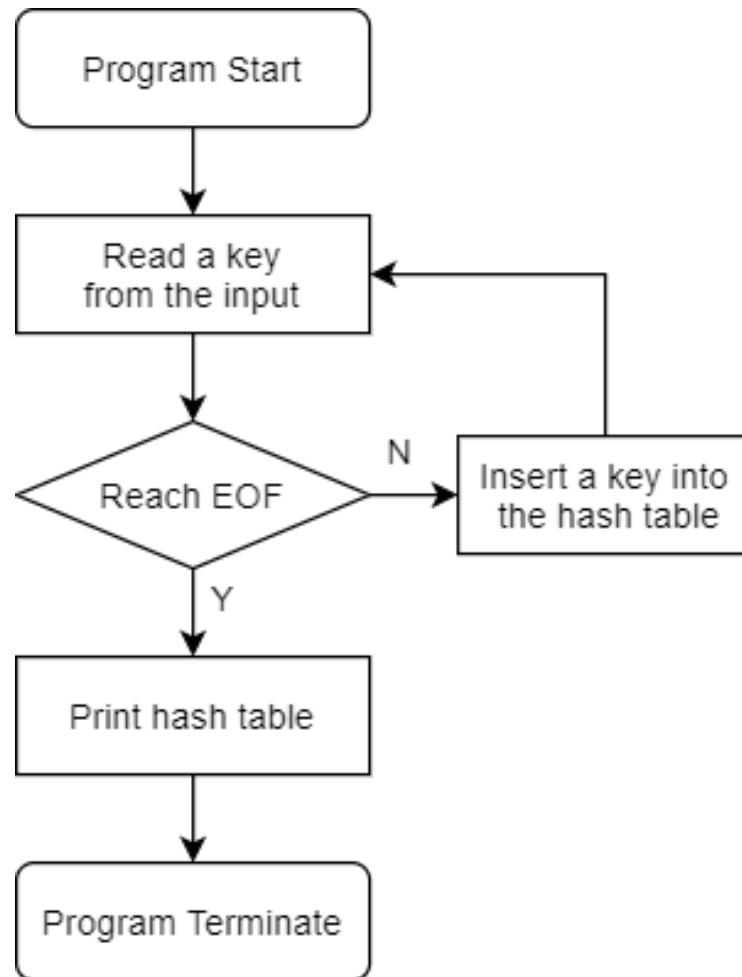
Print hash table

Program Terminate

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
```