

Christian McGovern, 1/28/18, Program which allows the insert, display, deletion, modification and search of a symbol table.

- 1) Code commented and indented. Header added.
- 2) 4 action screenshots:

```
mcgovern@Christian-PC: /mnt/c/Users/Christian/Desktop/Google_Drive/Course-Work/NMSU-Compilers/lab3
mcgovern@Christian-PC: /mnt/c/Users/Christian/Desktop/Google_Drive/Course-Work/NMSU-Compilers/lab3$ clear
mcgovern@Christian-PC: /mnt/c/Users/Christian/Desktop/Google_Drive/Course-Work/NMSU-Compilers/lab3$ ./syntable

SYMBOL TABLE IMPLEMENTATION

1.INSERT
2.DISPLAY
3.DELETE
4.SEARCH
5.MODIFY
6.END

Enter your option : 1

Enter the label : Test

Enter the symbol : #

Enter the address : 1995

Label inserted

SYMBOL TABLE IMPLEMENTATION

1.INSERT
2.DISPLAY
3.DELETE
4.SEARCH
5.MODIFY
6.END

Enter your option : 2

  LABEL      SYMBOL      ADDRESS
  Test       #           1995

SYMBOL TABLE IMPLEMENTATION

1.INSERT
2.DISPLAY
3.DELETE
4.SEARCH
5.MODIFY
6.END

Enter your option : 
```

(INSERT function demonstration)

```
mcgovern@Christian-PC: /mnt/c/Users/Christian/Desktop/Google_Drive/Course-Work/NMSU-Compilers/lab3

Enter your option : 2

  LABEL      SYMBOL      ADDRESS
  Test       #           1995

SYMBOL TABLE IMPLEMENTATION

1.INSERT
2.DISPLAY
3.DELETE
4.SEARCH
5.MODIFY
6.END

Enter your option : 3

Enter the label to be deleted : Test

After Deletion:

  LABEL      SYMBOL      ADDRESS

SYMBOL TABLE IMPLEMENTATION

1.INSERT
2.DISPLAY
3.DELETE
4.SEARCH
5.MODIFY
6.END

Enter your option : 
```

(DELETION function demonstration)

```
mcgovern@Christian-PC: /mnt/c:/Users/Christian/Desktop/Google_Drive/Course-Work/HMSU-Compilers/lab3$
SYMBOL TABLE IMPLEMENTATION
1.INSERT
2.DISPLAY
3.DELETE
4.SEARCH
5.MODIFY
6.END
Enter your option : 1
Enter the label : Test
Enter the symbol : %
Enter the address : 12321
Label inserted
SYMBOL TABLE IMPLEMENTATION
1.INSERT
2.DISPLAY
3.DELETE
4.SEARCH
5.MODIFY
6.END
Enter your option : 5
What do you want to modify?
1.Only the label
2.Only the address
3.Both the label and address
Enter your choice : 3
Enter the old label : Test
Enter the new label : TestModify
Enter the new address : 1111
After Modification:
LABEL      SYMBOL      ADDRESS
TestModify      1111
```

(MODIFY function demonstration)

```
mcgovern@Christian-PC: /mnt/c:/Users/Christian/Desktop/Google_Drive/Course-Work/HMSU-Compilers/lab3$
SYMBOL TABLE IMPLEMENTATION
1.INSERT
2.DISPLAY
3.DELETE
4.SEARCH
5.MODIFY
6.END
Enter your option : 1
Enter the label : Test
Enter the symbol : %
Enter the address : 11
Label inserted
SYMBOL TABLE IMPLEMENTATION
1.INSERT
2.DISPLAY
3.DELETE
4.SEARCH
5.MODIFY
6.END
Enter your option : 1
Enter the label : Test2
Enter the symbol : #
Enter the address : 112
Label inserted
SYMBOL TABLE IMPLEMENTATION
1.INSERT
2.DISPLAY
3.DELETE
4.SEARCH
5.MODIFY
6.END
Enter your option : 4
Enter the label to be searched : Test2
Search Result:
The label is present in the symbol table
```

(SEARCH function demonstrated)

- 3) The main structure of the code is called SymbTab{}, Its fields are 2 char arrays. An int, and a struct data type for the pointer next. Also 2 struct Symbtab pointers called first and last declared outside SymbTab{}. The structure is built around using pointers and accessing the data from anywhere in the program, in this case it is accessed from all the functions.
- 4) Malloc() is a function which allocates memory dynamically. We use malloc() because what if we do not know how much data is going to be used? Instead of using a static number and guessing we can use malloc to allocate memory whenever we need it. In the case of our symtable.c, it is used to dynamically allocate memory for the size of our struct SymbTab.