

19CSE401 Compiler Design Lab

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Lab Exercise- 04

Aim: To Implement Symbol Table

Code:

```
#include <stdio.h>
#include <stdlib.h>
#include <ctype.h>

int main() {
    int x = 0, i = 0, j = 0;
    void *T4Tutorials_address[50]; // Symbol addresses
    char T4Tutorials_Array2[50]; // Input expression
    char T4Tutorials_Array3[50]; // Symbols stored
    char c;

    printf("Input the expression ending with $ sign: ");
    while ((c = getchar()) != '$') {
        T4Tutorials_Array2[i++] = c;
    }
    int n = i - 1;

    // Display the entered expression
    printf("\nGiven Expression: ");
    for (i = 0; i <= n; i++) {
        printf("%c", T4Tutorials_Array2[i]);
    }

    // Display Symbol Table
    printf("\n\nSymbol Table display\n");
    printf("Symbol \t Address \t Type\n");
```

```

for (j = 0; j <= n; j++) {
    c = T4Tutorials_Array2[j];
    if (isalpha(c)) {
        // Allocate memory for identifier (1 byte per char)
        void *mypointer = malloc(sizeof(char));
        T4Tutorials_address[x] = mypointer;
        T4Tutorials_Array3[x] = c;
        printf("%c \t %p \t identifier\n", c, mypointer);
        x++;
    } else if (c == '+' || c == '-' || c == '*' || c == '=') {
        // Allocate memory for operator (1 byte)
        void *mypointer = malloc(sizeof(char));
        T4Tutorials_address[x] = mypointer;
        T4Tutorials_Array3[x] = c;
        printf("%c \t %p \t operator\n", c, mypointer);
        x++;
    }
}

// Free allocated memory
for (i = 0; i < x; i++) {
    free(T4Tutorials_address[i]);
}

return 0;
}

```

Output:

```

asecomputerlab@linux:~/CDLAB180$ nano symbol_table.c
asecomputerlab@linux:~/CDLAB180$ gcc symbol_table.c -o symbol_table
asecomputerlab@linux:~/CDLAB180$ ./symbol_table
Input the expression ending with $ sign: a+b=c$

Given Expression: a+b=c

Symbol Table display
Symbol    Address          Type
a         0x564c531d6ac0   identifier
+         0x564c531d6ae0   operator
b         0x564c531d6b00   identifier
=         0x564c531d6b20   operator
c         0x564c531d6b40   identifier

```

Result: Thus, the program to implement symbol table has been executed successfully.