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Subject MAP

Practical 3:

%{

#include <stdio.h>

#include <stdlib.h>

#include <string.h>

#define MAX 100

typedef struct Symbol {

    char name[MAX];

    char type[MAX];

    int line;

    char scope[MAX];

    struct Symbol \*next;

} Symbol;

Symbol \*head = NULL;

char current\_type[MAX] = "";

int yylineno = 1;

// Function to check if identifier already exists

int exists(char \*name) {

    Symbol \*temp = head;

    while (temp) {

        if (strcmp(temp->name, name) == 0) return 1;

        temp = temp->next;

    }

    return 0;

}

// Insert identifier into symbol table

void insertSymbol(char \*name, int line) {

    if (exists(name)) return;

    Symbol \*node = (Symbol \*)malloc(sizeof(Symbol));

    strcpy(node->name, name);

    strcpy(node->type, current\_type);

    strcpy(node->scope, "global");

    node->line = line;

    node->next = head;

    head = node;

    printf("Identifier: %s (line %d)\n", name, line);

}

// Print the final symbol table

void printSymbolTable() {

    printf("\nSymbol Table:\n");

    printf("--------------------------------------------------\n");

    printf("Identifier      Type       Line       Scope     \n");

    printf("--------------------------------------------------\n");

    Symbol \*temp = head;

    while (temp) {

        printf("%-15s %-10s %-10d %-10s\n", temp->name, temp->type, temp->line, temp->scope);

        temp = temp->next;

    }

}

%}

%option noyywrap

%x TYPE

%%

"int"      { strcpy(current\_type, "int"); printf("Keyword: int\n"); BEGIN(TYPE); }

"float"    { strcpy(current\_type, "float"); printf("Keyword: float\n"); BEGIN(TYPE); }

"char"     { strcpy(current\_type, "char"); printf("Keyword: char\n"); BEGIN(TYPE); }

"return"   { printf("Keyword: return\n"); }

<INITIAL,TYPE>[a-zA-Z\_][a-zA-Z0-9\_]\* {

    if (strlen(current\_type) > 0) {

        insertSymbol(yytext, yylineno);

        BEGIN(INITIAL);

    }

    else {

        printf("Identifier: %s (line %d)\n", yytext, yylineno);

    }

}

\n         { yylineno++; }

[ \t]+     { /\* skip whitespace \*/ }

.          { /\* skip all other characters \*/ }

%%

int main() {

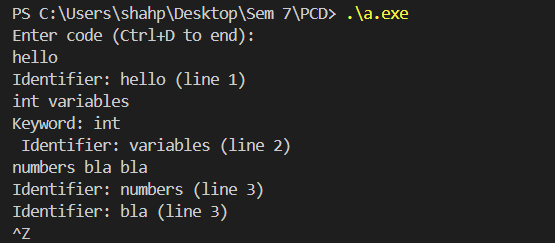
    printf("Enter code (Ctrl+D to end):\n");

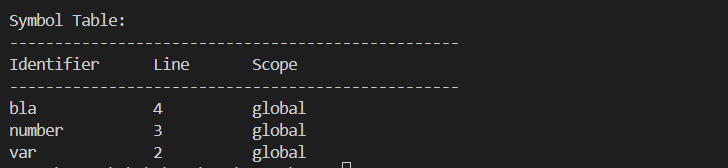
    yylex();

    printSymbolTable();

    return 0;

}

****

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