ANTRIKSH SHARMA 20070122021

CC LAB 07 | Postfix Evaluation

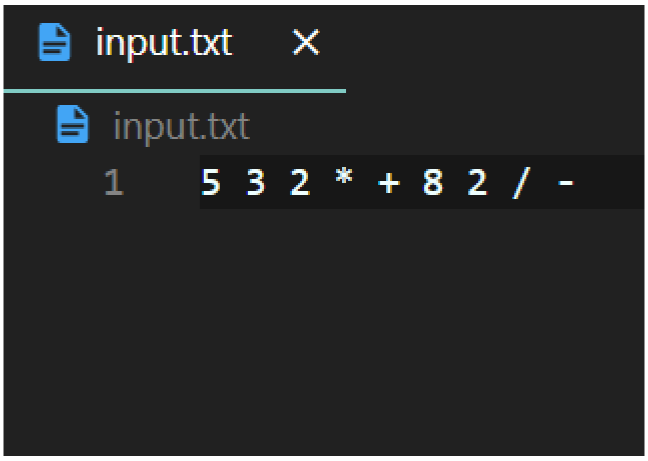
Aim: Lex program to evaluate a postfix expression

Implementation:

```
%{
#include <stdio.h>
#include <stdlib.h>

#define MAX_STACK_SIZE 100

int stack[MAX_STACK_SIZE];
int top = -1;

void push(int value) {
    if (top >= MAX_STACK_SIZE - 1) {
        fprintf(stderr, "Stack overflow\n");
        exit(1);
    }
    stack[++top] = value;
}

int pop() {
    if (top < 0) {
        fprintf(stderr, "Stack underflow\n");
        exit(1);
    }
    return stack[top--];
}
%}

%option noyywrap

%%
[0-9]+     { int value = atoi(yytext); push(value); }
[-+*/]     {
               int operand2 = pop();
               int operand1 = pop();
               int result;
               switch (yytext[0]) {
                   case '+': result = operand1 + operand2; break;
                   case '-': result = operand1 - operand2; break;
                   case '*': result = operand1 * operand2; break;
                   case '/': result = operand1 / operand2; break;
```

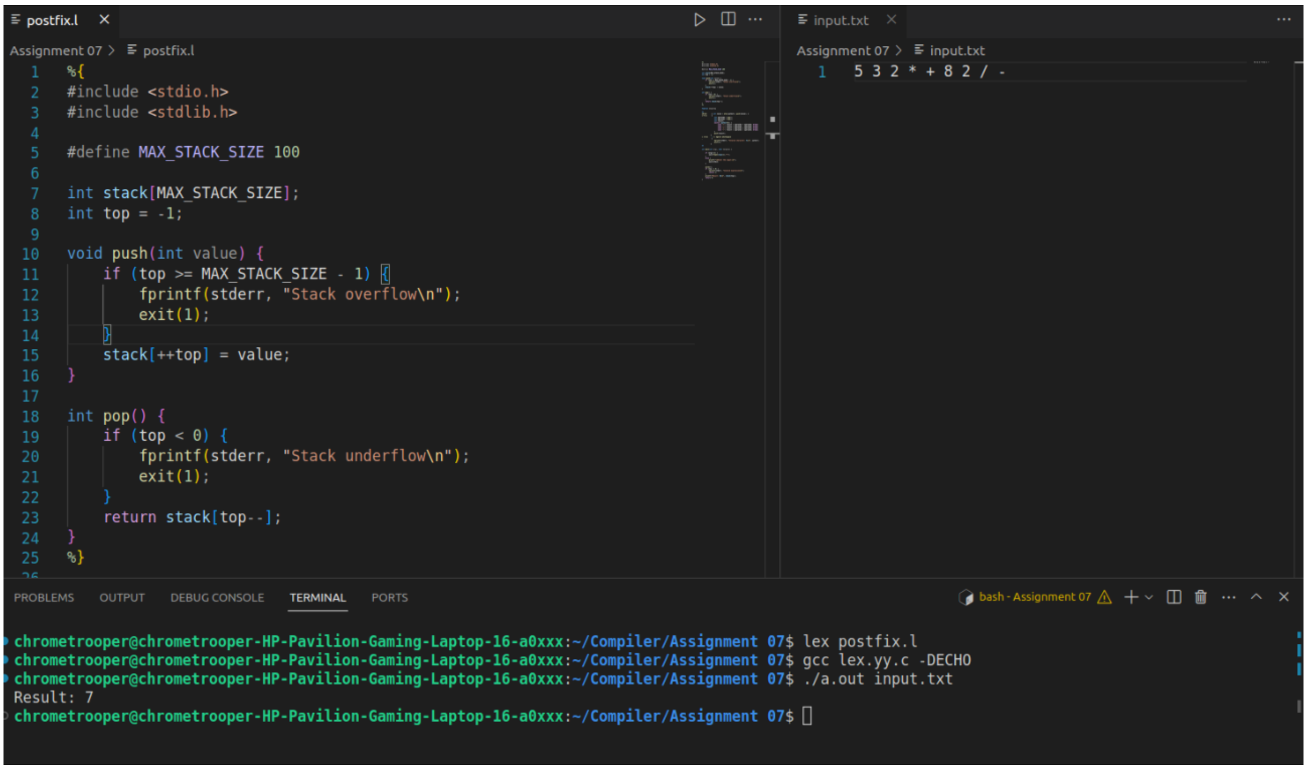
```
              }
              push(result);
          }
[ \t\n]     ; // Ignore whitespace
.           {
              fprintf(stderr, "Invalid character: %s\n", yytext);
              exit(1);
          }
%%

int main(int argc, char *argv[]) {

    if (argc==2) {
        yyin=fopen(argv[1],"r");
    }
    else {
        printf("\nEnter the input:\n");
        yyin=stdin;
    }

    yylex();
    if (top != 0) {
        fprintf(stderr, "Invalid expression\n");
        return 1;
    }
    printf("Result: %d\n", stack[top]);
    return 0;
}
```

Input:



```
5 3 2 * + 8 2 / -
```

Output:



```c
%{
#include <stdio.h>
#include <stdlib.h>

#define MAX_STACK_SIZE 100

int stack[MAX_STACK_SIZE];
int top = -1;

void push(int value) {
    if (top >= MAX_STACK_SIZE - 1) {
        fprintf(stderr, "Stack overflow\n");
        exit(1);
    }
    stack[++top] = value;
}

int pop() {
    if (top < 0) {
        fprintf(stderr, "Stack underflow\n");
        exit(1);
    }
    return stack[top--];
}
%}
```

```
5 3 2 * + 8 2 / -
```

```
chrometrooper@chrometrooper-HP-Pavilion-Gaming-Laptop-16-a0xxx:~/Compiler/Assignment 07$ lex postfix.l
chrometrooper@chrometrooper-HP-Pavilion-Gaming-Laptop-16-a0xxx:~/Compiler/Assignment 07$ gcc lex.yy.c -DECHO
chrometrooper@chrometrooper-HP-Pavilion-Gaming-Laptop-16-a0xxx:~/Compiler/Assignment 07$ ./a.out input.txt
Result: 7
chrometrooper@chrometrooper-HP-Pavilion-Gaming-Laptop-16-a0xxx:~/Compiler/Assignment 07$ 
```