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#include <stdio.h>
#include <string.h>
#include <stdlib.h>
#define MAX 100
char stack[MAX];
int top = -1;
void push(char c) {
    stack[++top] = c;
}
char pop() {
    if (top == -1) return '\0';
    return stack[top--];
}
void displayStack() {
    for (int i = 0; i <= top; i++) printf("%c", stack[i]);
    printf("\n");
}
int reduce() {
    if (top >= 0 && stack[top] == 'i') {
        stack[top] = 'E';
        printf("REDUCE: E->id\n");
        return 1;
    }
    if (top >= 2 && stack[top-2] == 'E' && stack[top-1] == '+' && stack[top] == 'E') {
        top -= 2;
        stack[top] = 'E';
        printf("REDUCE: E->E+E\n");
        return 1;
    }
    if (top >= 2 && stack[top-2] == 'E' && stack[top-1] == '*' && stack[top] == 'E') {
        top -= 2;
        stack[top] = 'E';
        printf("REDUCE: E->E*E\n");
        return 1;
    }
    if (top >= 2 && stack[top-2] == '(' && stack[top-1] == 'E' && stack[top] == ')') {
        top -= 2;
        stack[top] = 'E';
        printf("REDUCE: E->(E)\n");
        return 1;
    }
    return 0; // no reduction
}
int main() {
    char input[100];
    printf("Enter input (use i for id): ");
    scanf("%s", input);
    int i = 0;
    printf("STACK\tINPUT\tACTION\n");
    while (1) {
        if (input[i] != '\0') {
            push(input[i]);
            printf("%-10s", stack);
            printf("%-10s", &input[i+1]);
            printf("SHIFT %c\n", input[i]);
            i++;
        }
        while (reduce());
        if (top == 0 && stack[top] == 'E' && input[i] == '\0') {
            printf("%-10s%-10sACCEPT\n", stack, &input[i]);
            break;
        }
        if (input[i] == '\0' && !reduce()) {
            printf("Syntax Error!\n");
            break;
        }
    }
    return 0;
}

```