LL(1) PARSER

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Experiment No: 03

Aim: To implement LL(1) parsing using C program

CODE

```c
UW PICO 5.09                                                          File: x.c
#include <stdio.h>
#include <stdlib.h>
#include <string.h>

char *ip;
char stack[100]; int top=-1;

void push(char c){stack[++top]=c;}
void pop(){if(top>=0)top--;}
void show(){printf("STACK: ");for(int i=0;i<=top;i++)printf("%c",stack[i]);printf("   INPUT: %s\n",ip);}

void match(char c){ if(*ip==c){pop();ip++;show();} else {printf("Error\n");exit(0);} }

void E(),Q(),T(),R(),F();

void E(){ pop(); push('Q'); push('T'); show(); T(); Q(); }
void Q(){ if(*ip=='+'){ pop(); push('Q'); push('T'); push('+'); show(); match('+'); T(); Q(); } else pop(); show(); }
void T(){ pop(); push('R'); push('F'); show(); F(); R(); }
void R(){ if(*ip=='*'){ pop(); push('R'); push('F'); push('*'); show(); match('*'); F(); R(); } else pop(); show(); }
void F(){ if(*ip=='i'){ pop(); push('i'); show(); match('i'); }
          else if(*ip=='('){ pop(); push(')'); push('E'); push('('); show(); match('('); E(); match(')'); }
          else {printf("Error\n");exit(0);} }

int main(){
    char input[100]; printf("Enter input: "); scanf("%s",input);
    strcat(input,"$"); ip=input;
    push('$'); push('E'); show();
    E();
    if(*ip=='$') printf("SUCCESS\n"); else printf("FAIL\n");
}
```
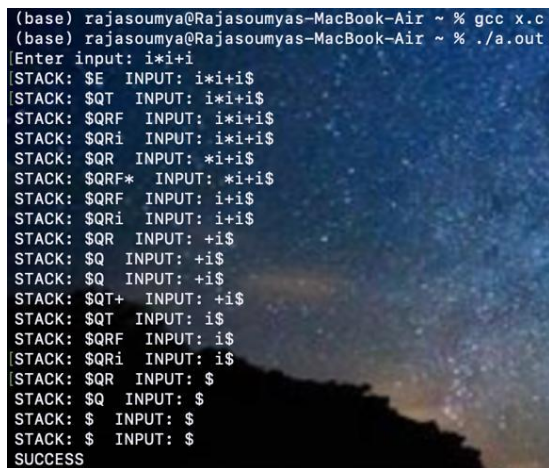
OUTPUT

```
(base) rajasoumya@Rajasoumyas-MacBook-Air ~ % gcc x.c
(base) rajasoumya@Rajasoumyas-MacBook-Air ~ % ./a.out
Enter input: i*i+i
STACK: $E   INPUT: i*i+i$
STACK: $QT  INPUT: i*i+i$
STACK: $QRF  INPUT: i*i+i$
STACK: $QRi  INPUT: i*i+i$
STACK: $QR  INPUT: *i+i$
STACK: $QRF*  INPUT: *i+i$
STACK: $QRF  INPUT: i+i$
STACK: $QRi  INPUT: i+i$
STACK: $QR  INPUT: +i$
STACK: $Q   INPUT: +i$
STACK: $Q   INPUT: +i$
STACK: $QT+  INPUT: +i$
STACK: $QT  INPUT: i$
STACK: $QRF  INPUT: i$
STACK: $QRi  INPUT: i$
STACK: $QR  INPUT: $
STACK: $Q   INPUT: $
STACK: $   INPUT: $
STACK: $   INPUT: $
SUCCESS
```

RESULT

LL parsing is implemented using C program and the given code is successfully parsed using stack approach.