//Predictive Parser

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#include<stdio.h>

#include<stdlib.h>

#include<string.h>

#include<ctype.h>

struct stack{

char str[20][20];

int top;

};

void push(struct stack \*obj,char s[]){

obj->top++;

strcpy(obj->str[obj->top],s);

}

void pop(struct stack \*obj){

obj->top--;

}

char \*get(char tab[20][20][20],char \*s1,char \*s2){

int i,j;

char \*s = (char\*)malloc(5\*sizeof(char));

for(i=1;i<7;i++){

if(strcmp(s1,tab[i][0])==0){

for(j=1;j<7;j++){

if(strcmp(tab[0][j],s2)==0 && strcmp(tab[i][j],"-")!=0){

return tab[i][j];

}

}

}

}

return NULL;

}

void pstack(struct stack \*ob){

int i;

for(i=0;i<=ob->top;i++) {

printf("%s",ob->str[i]);

}

}

void rpstack(struct stack \*ob){

int i;

for(i=ob->top;i>=0;i--) {

printf("%s",ob->str[i]);

}

}

int main(){

struct stack \*in,\*st;

in = (struct stack\*)malloc(1\*sizeof(struct stack));

st = (struct stack\*)malloc(1\*sizeof(struct stack));

int cnt=0;

in->top=-1;

st->top=-1;

char ids [5];

strcpy(ids,"id");

int flag=0;

char \*str = (char\*)malloc(20\*sizeof(char));

char input[20][20];char s[2];

char stk[20];

char s1[10],s2[10],s3[10],s4[10],s5[10],s6[10],s7[10];

char tab[20][20][20];

FILE \*f;

f = fopen("tab.txt","r");

int i=0,j=0;

while(1) {

if(feof(f)>0)

break;

fscanf(f,"%s\t%s\t%s\t%s\t%s\t%s\t%s\n",tab[i][0],tab[i][1],tab[i][2],tab[i][3],tab[i][4],tab[i][5],tab[i][6]);

i++;

}

printf("Enter input string:");

i=0;

while(1){

scanf("%s",input[i]);

if(strcmp(input[i],"$")==0)

break;

else

i++;

}

push(in,"$");

for(j=i-1;j>=0;j--)

push(in,input[j]);

push(st,"$");

push(st,"E");

printf("\n");

pstack(st);

printf("\t");

rpstack(in);

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

while(cnt<20){

cnt++;

if(strcmp(st->str[st->top],"$")==0 && strcmp("$",in->str[in->top])==0 && in->top==0 && st->top==0){

flag =1;

break;

}

if(strcmp(st->str[st->top],in->str[in->top])==0){

pop(st);

pop(in);

}

else{

str = get(tab,st->str[st->top],in->str[in->top]);

if(str!=NULL) {

printf("\n");

pstack(st);

printf("\t");

rpstack(in);

printf("\t%s",str);

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

if(str[strlen(str)-1] == '#') {

printf("\n");

pstack(st);

printf("\t");

rpstack(in);

printf("\t%s",str);

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

pop(st);

}

else{

pop(st);

for(i=strlen(str)-1;i>=0 && str[i]!='>';i--){

if(str[i] == 'd' || str[i] =='i'){

push(st,ids);

i=i--;

}

else{

s[0]=str[i];

s[1]='\0';

push(st,s);

}

}

}

}

else

break;

}

}

if(flag ==1)

printf("\nString Accepted");

else

printf("\nString Rejected");

printf("\n");

pstack(st);

printf("\t");

rpstack(in);

printf("\t%s",str);

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

fclose(f);

return 0;

}

root@AumrudhLalKumarTJ:~/lab/systemsoftware/ex9# ./a.out

Enter input string:id + id $

$E id+id$

-----------

$E id+id$ E->TH

-----------

$HT id+id$ T->FU

-----------

$HUF id+id$ F->id

-----------

$HU +id$ U->#

-----------

$HU +id$ U->#

-----------

$H +id$ H->+TH

-----------

$HT id$ T->FU

-----------

$HUF id$ F->id

-----------

$HU $ U->#

-----------

$HU $ U->#

-----------

$H $ H->#

-----------

$H $ H->#

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String Accepted

$ $ H->#