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EXPERIMENT : 7

DATE : 02/03/23

SHIFT REDUCE PARSER

AIM : To write a program in C/C++ to implement the shift reduce parser.

PROCEDURE:

1. Shift Reduce Parser requires two Data Structures
   - ☐ Input Buffer
   - ☐ Stack
2. It uses a stack and an input buffer.
3. Insert $ at the bottom of the stack and the right end of the input string in Input Buffer.
4. Shift − Parser shifts zero or more input symbols onto the stack until the handle is on top of the stack.
5. Reduce − Parser reduces or replaces the handle on top of the stack to the left side of production, i.e., R.H.S. of production is popped, and L.H.S is pushed.
6. Accept − Step 3 and Step 4 will be repeated until it has detected an error or until the stack includes start symbol (S) and input Buffer is empty, i.e., it contains $.
7. Handle − Each replacement of the Right side of production by the left side in the process above is known as "Reduction" and each replacement is called "Handle."
8. Error: This is the situation in which the parser can neither perform shift action nor reduce action and not even accept action.

PROGRAM:

```
#include<iostream>
#include<string.h>
using namespace std;
struct prodn
{
        char p1[10];
        char p2[10];
};
int main()
{
        char input[20],stack[50],temp[50],ch[2],*t1,*t2,*t;
        int i,j,s1,s2,s,count=0;
        struct prodn p[10];
        FILE *fp=fopen("sr_input.txt","r");
        stack[0]='\0';
        cout<<"Enter the Input String:\n";
        cin>>input;
        while(!feof(fp))
        {
```

```
		fscanf(fp,"%s\n",temp);
		t1=strtok(temp,"->");
		t2=strtok(NULL,"->");
		strcpy(p[count].p1,t1);
		strcpy(p[count].p2,t2);
		count++;
	}
	i=0;
	while(1)
	{
		if(i<strlen(input))
		{
			ch[0]=input[i];
			ch[1]='\0';
			i++;
			strcat(stack,ch);
			cout<<"\n"<<stack;
		}
		for(j=0;j<count;j++)
		{
			t=strstr(stack,p[j].p2);
			if(t!=NULL)
			{
				s1=strlen(stack);
				s2=strlen(t);
				s=s1-s2;
				stack[s]='\0';
				strcat(stack,p[j].p1);
				cout<<"\n"<<stack;
				j=-1;
			}
		}
		if(strcmp(stack,"E")==0&&i==strlen(input))
		{
			cout<<"\n\nAccepted";
			break;
		}
		if(i==strlen(input))
		{
			cout<<"\n\nNot Accepted";
			break;
		}
	}
	return 0;
}
```

INPUT:

“sr_input.txt”

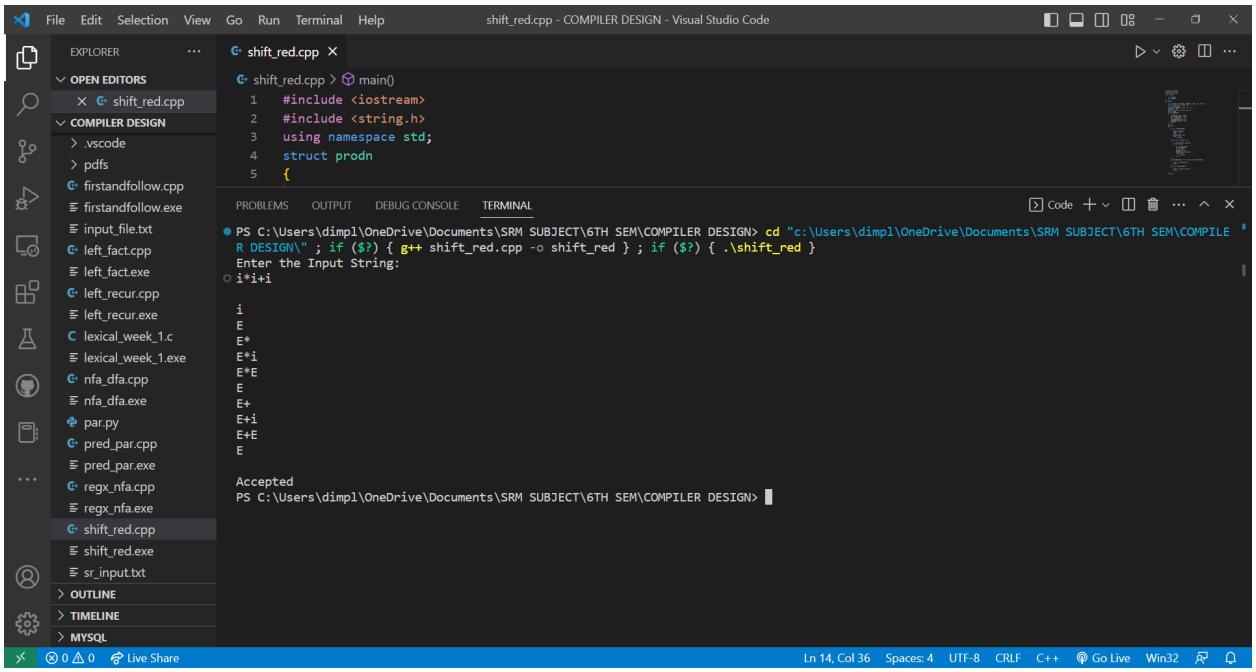
E->E+E

E->E*E

E->

Enter the input string: i*i+i

OUTPUT:



RESULT:

Thus, we have successfully implemented the shift reduce parser.