```
import java.io.*;
import java.util.*;
public class parser{
static HashMap<String,String> acctyp;
public static void main(String args[])throws IOException{
Scanner sc=new Scanner(System.in);
ArrayList<String> stack=new ArrayList<String>();
stack.add("$");
stack.add("E");
//entering entries in table

HashMap<String, HashMap<String,String>> gens = new HashMap<String,HashMap<String,String>>();

        acctyp = new HashMap<String,String>();
        acctyp.put("i","TA");
        acctyp.put("(","TA");
        gens.put("E", acctyp);

        acctyp = new HashMap<String,String>();
        acctyp.put("+","+TA");
        acctyp.put(")","epsilon");
        acctyp.put("$","epsilon");
        gens.put("A", acctyp);

        acctyp = new HashMap<String,String>();
        acctyp.put("i","FB");
        acctyp.put("(","FB");
        gens.put("T", acctyp);

        acctyp = new HashMap<String,String>();
        acctyp.put("+","epsilon");
        acctyp.put("*","*FB");
        acctyp.put(")","epsilon");
        acctyp.put("$","epsilon");
        gens.put("B", acctyp);

        acctyp = new HashMap<String,String>();
        acctyp.put("i","i");
        acctyp.put("(","(E)");
        gens.put("F", acctyp);

        System.out.println("Enter the string to be checked");
        String s=sc.next();
        int flag=1;
        int point=0;
        while(stack.size()>0){
                String lhs=stack.get(stack.size()-1);
                //System.out.println("point is "+point);
                String ans=gens.get(lhs).get(s.charAt(point)+"");
```

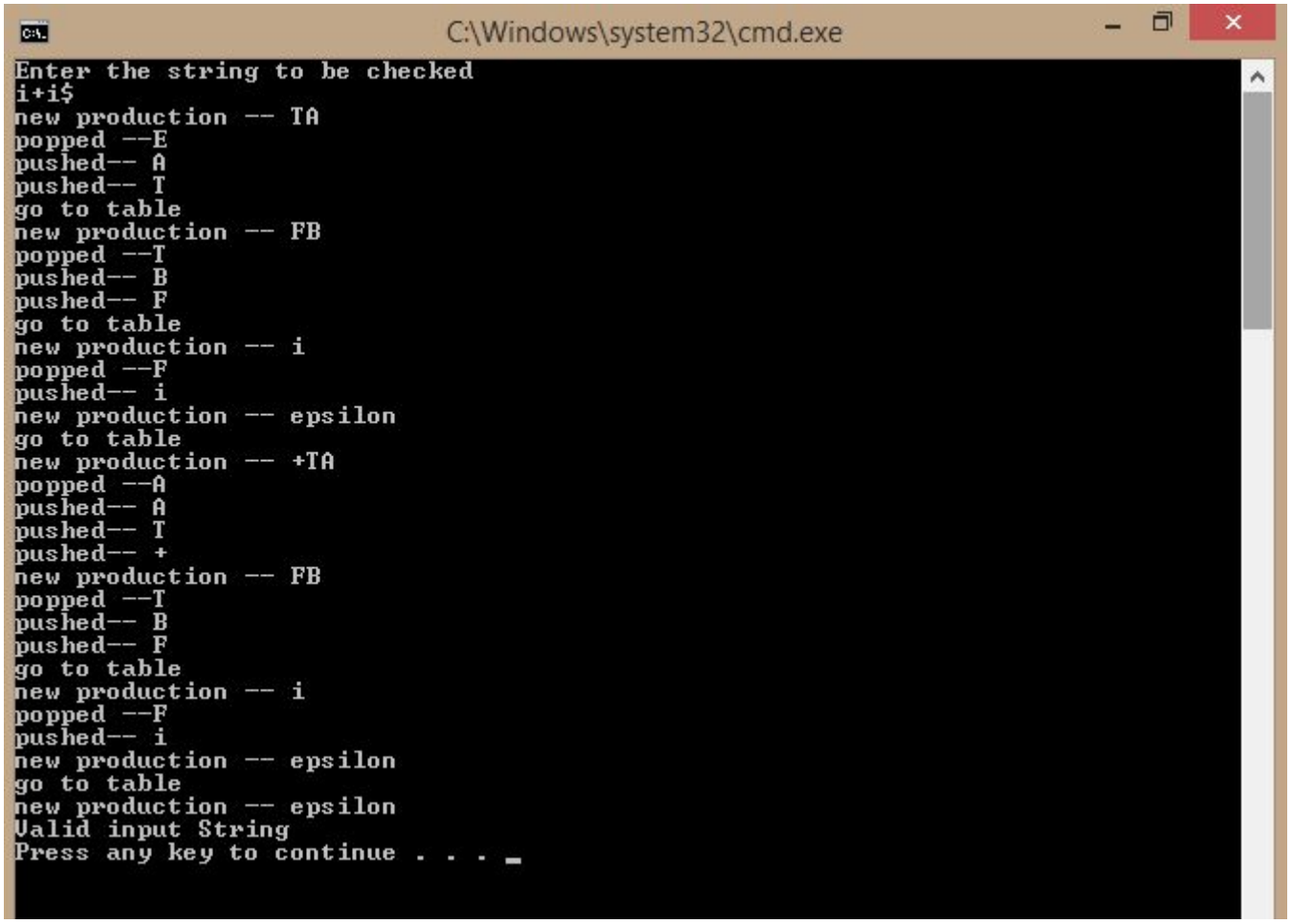
```
                if(ans==null){
                        flag=0;
                        System.out.println("invalid string");
                        break;
                        }
                if(ans.equals("epsilon"))
                        stack.remove(stack.size()-1);
                //System.out.println("stacktop "+lhs);
                System.out.println("new production -- "+ans);
                if(lhs.charAt(0)>='A'&&lhs.charAt(0)<='Z'){
                        if(!ans.equals("epsilon")){
                                System.out.println("popped --"+stack.get(stack.size()-1));
                //pop top element
                                stack.remove(stack.size()-1);
                //insert new char
                                }
                                for(int k=ans.length()-1;k>=0;k-- )
                                {
                                if(!ans.equals("epsilon")){
                                stack.add(ans.charAt(k)+"");
                                System.out.println("pushed-- "+ans.charAt(k));}
                                }
                }

                if(s.charAt(point)==(stack.get(stack.size()-1)).charAt(0)){
                //pop
                        stack.remove(stack.size()-1);
                //move to next element
                        point++;
                //System.out.println("valid character found");
                }
                else if(stack.get(stack.size()-1).charAt(0)>='A'&&stack.get(stack.size()-1).charAt(0)<='Z'){
                System.out.println("go to table");
                }
                else{
                        if(!ans.equals("epsilon")){
                        System.out.println("Invalid String ");
                        flag=0;
                        break;
                        }
                }

        }

if(flag==1)
System.out.println("Valid input String");
}
}
```

Output
:


C:\Windows\system32\cmd.exe
Enter the string to be checked
i+i$
new production -- TA
popped --E
pushed-- A
pushed-- T
go to table
new production -- FB
popped --T
pushed-- B
pushed-- F
go to table
new production -- i
popped --F
pushed-- i
new production -- epsilon
go to table
new production -- +TA
popped --A
pushed-- A
pushed-- T
pushed-- +
new production -- FB
popped --T
pushed-- B
pushed-- F
go to table
new production -- i
popped --F
pushed-- i
new production -- epsilon
go to table
new production -- epsilon
Valid input String
Press any key to continue . . .