CONVERSION FROM REGULAR EXPRESSION TO NFA

EX. NO. 2
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AIM: To write a program for converting Regular Expression to NFA.

ALGORITHM:

1. Start
2. Get the input from the user
3. Initialize separate variables and functions for Postfix , Display and NFA
4. Create separate methods for different operators like +,*, .
5. By using Switch case Initialize different cases for the input
6. For ' . ' operator Initialize a separate method by using various stack functions do the same for the other operators like ' * ' and ' + '.
7. Regular expression is in the form like a.b (or) a+b
8. Display the output
9. Stop

PROGRAM :

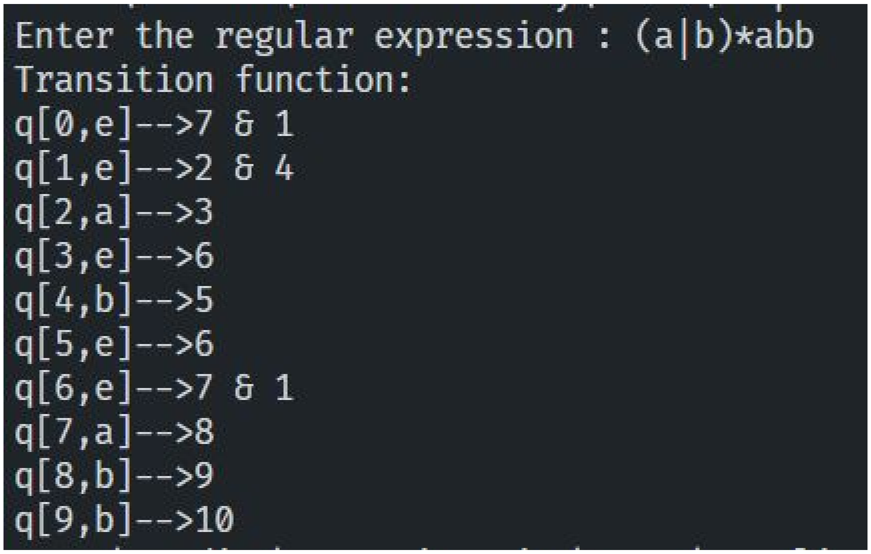
```
transition_table = [ [0]*3 for _ in range(20) ]

re = input("Enter the regular expression : ")
re += " "


i = 0
j = 1
while(i<len(re)):
    if re[i] == 'a':
        try:
            if re[i+1] != '|' and re[i+1] !='*':
```

```
            transition_table[j][0] = j+1
            j += 1
        elif re[i+1] == '|' and re[i+2] =='b':
            transition_table[j][2]=((j+1)*10)+(j+3)
            j+=1
            transition_table[j][0]=j+1
            j+=1
            transition_table[j][2]=j+3
            j+=1
            transition_table[j][1]=j+1
            j+=1
            transition_table[j][2]=j+1
            j+=1
            i=i+2
        elif re[i+1]=='*':
            transition_table[j][2]=((j+1)*10)+(j+3)
            j+=1
            transition_table[j][0]=j+1
            j+=1
            transition_table[j][2]=((j+1)*10)+(j-1)
            j+=1
    except:
        transition_table[j][0] = j+1

elif re[i] == 'b':
    try:
        if re[i+1] != '|' and re[i+1] !='*':
            transition_table[j][1] = j+1
            j += 1
        elif re[i+1]=='|' and re[i+2]=='a':
            transition_table[j][2]=((j+1)*10)+(j+3)
            j+=1
            transition_table[j][1]=j+1
            j+=1
            transition_table[j][2]=j+3
            j+=1
            transition_table[j][0]=j+1
            j+=1
            transition_table[j][2]=j+1
            j+=1
            i=i+2
        elif re[i+1]=='*':
            transition_table[j][2]=((j+1)*10)+(j+3)
            j+=1
            transition_table[j][1]=j+1
            j+=1
            transition_table[j][2]=((j+1)*10)+(j-1)
            j+=1
    except:
        transition_table[j][1] = j+1

elif re[i]=='e' and re[i+1]!='|'and re[i+1]!='*':
    transition_table[j][2]=j+1
    j+=1

elif re[i]==')' and re[i+1]=='*':


    transition_table[0][2]=((j+1)*10)+1
    transition_table[j][2]=((j+1)*10)+1
    j+=1

i +=1
```

```
print ("Transition function:")
for i in range(j):
   if(transition_table[i][0]!=0):
      print("q[{0},a]-->{1}".format(i,transition_table[i][0]))
   if(transition_table[i][1]!=0):
      print("q[{0},b]-->{1}".format(i,transition_table[i][1]))
   if(transition_table[i][2]!=0):
      if(transition_table[i][2]<10):
         print("q[{0},e]-->{1}".format(i,transition_table[i][2]))
      else:
         print("q[{0},e]-->{1} &
{2}".format(i,int(transition_table[i][2]/10),transition_table[i][2]%10))
```

INPUT : (a|b)*abb

OUTPUT :



```
Enter the regular expression : (a|b)*abb
Transition function:
q[0,e]-->7 & 1
q[1,e]-->2 & 4
q[2,a]-->3
q[3,e]-->6
q[4,b]-->5
q[5,e]-->6
q[6,e]-->7 & 1
q[7,a]-->8
q[8,b]-->9
q[9,b]-->10
```

RESULT :

The program to convert regular expressions to NFA was implemented successfully.