18CSC304J Compiler Design Lab

Exercise 2:

Conversion from Regular Expression to NFA

Submitted To:-

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CODE:-

```
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))
```

OUTPUT:-

```
PS C:\Users\Puneet Sharma> python -u "d:\Sem 6\CD\LAB\EX-2.py"
Enter the regular expression : a|b
Transition function:
q[1,e]-->2 &4
q[2,a]-->3
q[3,e]-->6
q[4,b]-->5
q[5,e]-->6
PS C:\Users\Puneet Sharma> python -u "d:\Sem 6\CD\LAB\EX-2.py"
Enter the regular expression : a*
Transition function:
q[1,e]-->2 &4
q[2,a]-->3
q[3,e]-->4 &2
PS C:\Users\Puneet Sharma>
```