write a C program to find ε-closure of a Non-Deterministic Finite Automata with ε-moves

PROGRAM:

```
#include<stdio.h>
#include<string.h>
int trans_table[10][5][3];
char symbol[5],a;
int e_closure[10][10],ptr,state;
void find_e_closure(int x);
int main()
{
int i,j,k,n,num_states,num_symbols;
for(i=0;i<10;i++)
{
for(j=0;j<5;j++)
{
for(k=0;k<3;k++)
{
trans_table[i][j][k]=-1;
}
}
}
printf("How may states in the NFA with e-moves:");
scanf("%d",&num_states);
printf("How many symbols in the input alphabet including e :");
scanf("%d",&num_symbols);
printf("Enter the symbols without space. Give 'e' first:");
scanf("%s",symbol);
for(i=0;i<num_states;i++)
{
```

```
for(j=0;j<num_symbols;j++)
{
printf("How many transitions from state %d for the input %c:",i,symbol[j]);
scanf("%d",&n);
for(k=0;k<n;k++)
{
printf("Enter the transitions %d from state %d for the input %c :", k+1,i,symbol[j]);
scanf("%d",&trans_table[i][j][k]);
}
}
}
for(i=0;i<10;i++)
{
for(j=0;j<10;j++)
{
e_closure[i][j]=-1;
}
}
for(i=0;i<num_states;i++)
e_closure[i][0]=i;
for(i=0;i<num_states;i++)
{
if(trans_table[i][0][0]==-1)
continue;
else
{
state=i;
ptr=1;
find_e_closure(i);
```

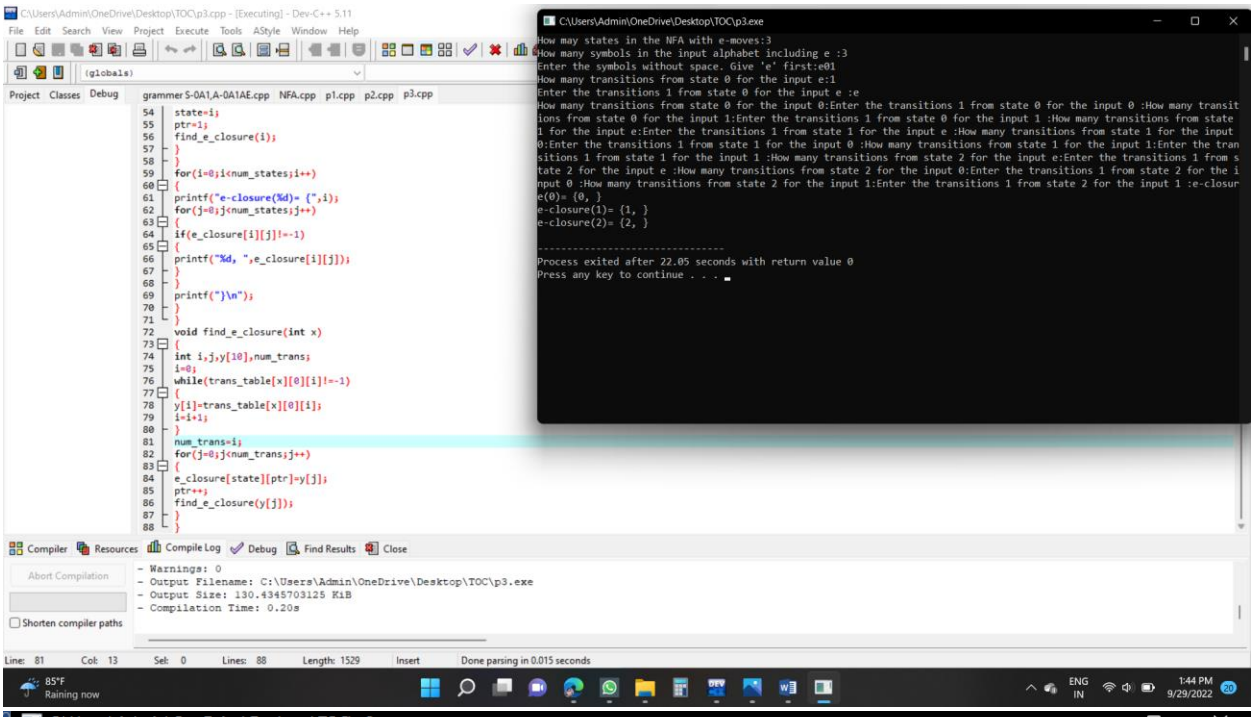
```
}
}
for(i=0;i<num_states;i++)
{
printf("e-closure(%d)= {",i);
for(j=0;j<num_states;j++)
{
if(e_closure[i][j]!=-1)
{
printf("%d, ",e_closure[i][j]);
}
}
printf("}\n");
}
}
void find_e_closure(int x)
{
int i,j,y[10],num_trans;
i=0;
while(trans_table[x][0][i]!=-1)
{
y[i]=trans_table[x][0][i];
i=i+1;
}
num_trans=i;
for(j=0;j<num_trans;j++)
{
e_closure[state][ptr]=y[j];
ptr++;
```

```
find_e_closure(y[j]);

}

}
```

OUTPUT:



C:\Users\Admin\OneDrive\Desktop\TOC\p3.exe
How may states in the NFA with e-moves:3
How many symbols in the input alphabet including e :3
Enter the symbols without space. Give 'e' first:e01
How many transitions from state 0 for the input e:1
Enter the transitions 1 from state 0 for the input e :e
How many transitions from state 0 for the input 0:Enter the transitions 1 from state 0 for the input 0 :How many transit
ions from state 0 for the input 1:Enter the transitions 1 from state 0 for the input 1 :How many transitions from state
1 for the input e:Enter the transitions 1 from state 1 for the input e :How many transitions from state 1 for the input
0:Enter the transitions 1 from state 1 for the input 0 :How many transitions from state 1 for the input 1:Enter the tran
sitions 1 from state 1 for the input 1 :How many transitions from state 2 for the input e:Enter the transitions 1 from s
tate 2 for the input e :How many transitions from state 2 for the input 0:Enter the transitions 1 from state 2 for the i
nput 0 :How many transitions from state 2 for the input 1:Enter the transitions 1 from state 2 for the input 1 :e-closur
e(0)= {0, }
e-closure(1)= {1, }
e-closure(2)= {2, }
Process exited after 22.05 seconds with return value 0
Press any key to continue . . .