

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

AIM : To 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:



```

2  #include<string.h>
3  int trans_table[10][5][3];
4  char symbol[5],a;
5  int e_closure[10][10],ptr,state;
6  void find_e_closure(int x);
7  int .....
8  int main()
9  {
10 int i,j,k,n,num_states,num_symbols;
11 for(i=0;i<10;i++)
12 {
13 for(j=0;j<5;j++)
14 {
15 for(k=0;k<3;k++)
16 {
17 trans_table[i][j][k]=-1;
18 }
19 }

```

RESULT: Output is successfully obtained.