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*NON-DETERMINISTIC FINITE AUTOMATA*

*#include<stdio.h>*

*#include<string.h>*

*int main()*

*{*

*int i,j,k,l,m,next\_state[20],n,mat[10][10][10],flag,p,exit;*

*int num\_states,final\_state[5],num\_symbols,num\_final;*

*int present\_state[20],prev\_trans,new\_trans;*

*char ch,input[20];*

*int symbol[5],inp,inp1;*

*printf("how many states in the nfa: ");*

*scanf("%d",&num\_states);*

*printf("how many symbols in the input alphabet: ");*

*scanf("%d",&num\_symbols);*

*for(i=0;i<num\_symbols;i++)*

*{*

*printf("enter the input symbol %d: ",i+1);*

*scanf("%d",&symbol[i]);*

*}*

*printf("how many final states: ");*

*scanf("%d",&num\_final);*

*for(i=0;i<num\_final;i++)*

*{*

*printf("enter the final state %d: ",i+1);*

*scanf("%d",&final\_state[i]);*

*}*

*for(i=0;i<10;i++)*

*{*

*for(j=0;j<10;j++)*

*{*

*for(k=0;k<10;k++)*

*{*

*mat[i][j][k]=-1;*

*}*

*}*

*}*

*for(i=0;i<num\_states;i++)*

*{*

*for(j=0;j<num\_symbols;j++)*

*{*

*printf("how many transitions from state %d for the input %d: ",i,symbol[j]);*

*scanf("%d",&n);*

*for(k=0;k<n;k++)*

*{*

*printf("enter the transition %d from state %d for the input %d: ",k+1,i,symbol[j]);*

*scanf("%d",&mat[i][j][k]);*

*}*

*}*

*}*

*printf("the transitions are stored as below\n");*

*for(i=0;i<10;i++)*

*{*

*for(j=0;j<10;j++)*

*{*

*for(k=0;k<10;k++)*

*{*

*if(mat[i][j][k]!=-1)*

*printf("mat[%d][%d][%d]=%d\n",i,j,k,mat[i][j][k]);*

*}*

*}*

*}*

*while(1)*

*{*

*printf("enter the input string: ");*

*scanf("%s",input);*

*present\_state[0]=0;*

*prev\_trans=1;*

*l=strlen(input);*

*for(i=0;i<l;i++)*

*{*

*if(input[i]=='0')*

*inp1=0;*

*else if(input[i]=='1')*

*inp=1;*

*else*

*{*

*printf("invalid input\n");*

*exit;*

*}*

*for(m=0;m<num\_symbols;m++)*

*{*

*if(inp1==symbol[m])*

*{*

*inp=m;*

*break;*

*}*

*}*

*new\_trans=0;*

*for(j=0;j<prev\_trans;j++)*

*{*

*k=0;*

*p=present\_state[j];*

*while(mat[p][inp][k]!=-1)*

*{*

*next\_state[new\_trans++]=mat[p][inp][k];*

*k++;*

*}*

*}*

*for(j=0;j<new\_trans;j++)*

*{*

*present\_state[j]=next\_state[j];*

*}*

*prev\_trans=new\_trans;*

*}*

*flag=0;*

*for(i=0;i<prev\_trans;i++)*

*{*

*for(j=0;j<num\_final;j++)*

*{*

*if(present\_state[i]==final\_state[j])*

*{*

*flag=1;*

*break;*

*}*

*}*

*}*

*if(flag==1)*

*printf("accepted\n");*

*else*

*printf("not accepted\n");*

*printf("try with another input\n");*

*}*

*}*

