#include<iostream.h>

#include<stdio.h>

#include<conio.h>

#include<string.h>

struct production

{

char l;

char r[10];

int rear;

};

struct production prod[20],pr\_new[20];

int p=0,b=0,d,f,q,n,flag=0;

char terminal[20],nonterm[20],alpha[10];

char x,epsilon='^';

void main()

{

clrscr();

cout<<"Enter the number of terminals: ";

cin>>d;

cout<<"Enter the terminal symbols for your production: ";

for(int k=0;k<d;k++)

{

cin>>terminal[k];

}

cout<<"\nEnter the number of non-terminals: ";

cin>>f;

cout<<"Enter the non-terminal symbols for your production: ";

for(k=0;k<f;k++)

{

cin>>nonterm[k];

}

cout<<"\nEnter the number of Special characters(except non-terminals): ";

cin>>q;

cout<<"Enter the special characters for your production: ";

for(k=0;k<q;k++)

{

cin>>alpha[k];

}

cout<<"\nEnter the number of productions: ";

cin>>n;

for(k=0;k<=n-1;k++)

{

cout<<"Enter the "<< k+1<<" production: ";

cin>>prod[k].l;

cout<<"->";

cin>>prod[k].r;

prod[k].rear=strlen(prod[k].r);

}

for(int m=0;m<f;m++)

{

x=nonterm[m];

for(int j=0;j<n;j++)

{

if((prod[j].l==x)&&(prod[j].r[0]==prod[j].l))

flag=1;

}

for(int i=0;i<n;i++)

{

if((prod[i].l==x)&&(prod[i].r[0]!=x)&&(flag==1))

{

pr\_new[b].l=x;

for(int c=0;c<prod[i].rear;c++)

pr\_new[b].r[c]=prod[i].r[c];

pr\_new[b++].r[c]=alpha[p];

}

else if((prod[i].l==x)&&(prod[i].r[0]==x)&&(flag==1))

{

pr\_new[b].l=alpha[p];

for(int a=0;a<=prod[i].rear-2;a++)

pr\_new[b].r[a]=prod[i].r[a+1];

pr\_new[b++].r[a]=alpha[p];

pr\_new[b].l=alpha[p];

pr\_new[b++].r[0]=epsilon;

}

else if((prod[i].l==x)&&(prod[i].r[0]!=x)&&(flag==0))

{

pr\_new[b].l=prod[i].l;

strcpy(pr\_new[b].r,prod[i].r);

b++;

}

}

flag=0;

p++;

}

cout<<"\n\n\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*";

cout<<"\n AFTER REMOVING LEFT RECURSION ";

cout<<"\n\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*"<<endl;

for(int s=0;s<=b-1;s++)

{

cout<<"Production "<<s+1<<" is: ";

cout<<pr\_new[s].l;

cout<<"->";

cout<<pr\_new[s].r;

cout<<endl;

}

getche();

}