```
#include"stdio.h"
#include"string.h"
#include"stdlib.h"
#include"ctype.h"
#include"math.h"
#define arm_a 1
#define arm_d 1
#define arm_ac 1
#define arm_t 1
#define bp3d 1
#define  total_cons 3

//#define LENGTH 73



int no=1,LENGTH;

int check_bond1(char a, char b)
{

      int c=0;
      if((a=='a'&&b=='t')||(a=='t'&&b=='a')||(a=='g'&&b=='c')||(a=='c'&&b
=='g'))c=1;
      else if((a=='t'&&b=='g')||(a=='g'&&b=='t')) c=1;
      else
if((a=='a'&&b=='a')||(a=='g'&&b=='g')||(a=='t'&&b=='t')||(a=='c'&&b=='c')
)c=2;
      else if((a=='c'&&b=='a')||(a=='a'&&b=='c')) c=2;
      else if((a=='c'&&b=='t')||(a=='t'&&b=='c')) c=2;
      else if((a=='g'&&b=='a')||(a=='a'&&b=='g')) c=2;
    return(c);
}




int math_1str_4th(char *p,char* q,char *p1,char *q1)
{
      int week_const;
      int i,l,j=8,k,flag;


    while(j<=12)

      {
            for(i=strlen(p)-1;i>=j-1;--i)
            {
            for(l=0;l<strlen(q)-j;++l)
            {
                        week_const=1;flag=0;
                  for(k=0;k<j;++k)
                  {
                        if(check_bond1(p[i-k],q[l+k])==0){flag=1;break;}
                  if(check_bond1(p[i-k],q[l+k])==2)
                  {
                        week_const--;if(week_const<0){flag=1;break;}
                  }
                  }
                  if(flag==0)
```

```
                  {
                        if(j<=9&&week_const==1)
                        { for (k=0;k<j;k++)
                        {p1[j-k-1]=p[i-k];q1[k]=q[l+k];}
                        p1[k]=q1[k]='\0';
                              return 1;
                        }
                  if(j>9&&week_const==0)
                        { for (k=0;k<j;k++)
                        {p1[j-k-1]=p[i-k];q1[k]=q[l+k];}
                        p1[k]=q1[k]='\0';
                              return 1;
                        }
                  }
            }
            }
            j++;
      }
      return 0;
}



int bh_loop(char *p,char *q)
{
      int week_const;
      int i,l,j=0,k,flag=0;

      i=0;l=2;

      for(k=0;k<4;++k)
            {
                  if(check_bond1(p[i+k],q[l+k])==1){flag++;}

            }

      if(flag<3)return 0;
      else
      {
            l=6;
            for(i=7;i<9;++i)
            {
                  flag=0;
                  for(k=0;k<4;++k)

                  if(check_bond1(p[i+k],q[l+k])==1){flag++;}


                  if(flag>=3)return 2;
            }
      }

return 0;

}
```

```
int check_bond(char a, char b)
{

      int c=0;
      if((a=='a'&&b=='t')||(a=='t'&&b=='a')||(a=='g'&&b=='c')||(a=='c'&&b
=='g'))c=1;
      else if((a=='t'&&b=='g')||(a=='g'&&b=='t')) c=1;
      else
if((a=='a'&&b=='a')||(a=='g'&&b=='g')||(a=='t'&&b=='t')||(a=='c'&&b=='c')
)c=2;
      else if((a=='c'&&b=='a')||(a=='a'&&b=='c')) c=2;
      else if((a=='c'&&b=='t')||(a=='t'&&b=='c')) c=2;
      else if((a=='g'&&b=='a')||(a=='a'&&b=='g')) c=2;
    return(c);
}


int check3dbp(char *bp,int a,int b,int c,int d)
{
      int bp3=bp3d;

      if(check_bond(bp[7],bp[13])==2)   bp3--;
      if(check_bond(bp[14],bp[47])==2)  bp3--;
      if(check_bond(bp[17],bp[54])==2)  bp3--;
      if(check_bond(bp[18],bp[55])==2)  bp3--;
      if(check_bond(bp[25],bp[43])==2)  bp3--;
      if(check_bond(bp[31],bp[37])==2)  bp3--;
      if(check_bond(bp[53],bp[57])==2)  bp3--;

      if(bp3<0)return 0;
      else
      {
            if(a+b+c+d+(bp3d-bp3)<=total_cons)
            {
                  //printf("a=%d b=%d c=%d d=%d
bp=%d\t%d\n",a,b,c,d,bp3,a+b+c+d+(bp3d-bp3));getch();
                  return 1;
            }
            else return 0;
      }
}




int check_first(char *p,int l)
{

int i,j,k,arm_for_a=arm_a,m,flag,c,n;
if(p[7]!='t')return 0;

//if(p[15]!='g'&&p[16]!='g'&&p[17]!='g'&&p[18]!='g')return 0;
```

```
//if(!
((p[15]!='g'&&p[16]!='g')||(p[15]!='g'&&p[16]!='a')||(p[15]!='g'&&p[16]!=
'c'))return 0;

//if(!
((p[16]!='g'&&p[17]!='g')||(p[16]!='g'&&p[17]!='a')||(p[16]!='g'&&p[17]!=
'c'))return 0;
//if(!
((p[17]!='g'&&p[18]!='g')||(p[17]!='g'&&p[18]!='a')||(p[17]!='g'&&p[18]!=
'c'))return 0;

//if(!
((p[18]!='g'&&p[19]!='g')||(p[18]!='g'&&p[19]!='a')||(p[18]!='g'&&p[19]!=
'c'))return 0;


//if(p[l-4]!='c'&&p[l-4]!='t')return 0;


//put j=0 if you want to take 9 absent position, otherwise put j=1;


for(j=1;j<2;++j)
{




            for(k=0;k<5;++k)
            {

                  m=0;flag=0;n=14;arm_for_a=arm_a;
               for(i=8+j;i<8+j+4;++i)
               {

                  c= check_bond(p[i+n+k-m],p[i]);
                  if(c==0){flag=0;break;};
            //    printf("c=%d\n",c);getch();
                  flag=1;
                     if( c==2)
                     {
                        arm_for_a--;if(arm_for_a<0){flag=0;break;}
                     }

                    m++;n--;
               }
               if(flag==1){//printf("OK k=%d\n",k);getch();


                     if(k<3)

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

                     {
                           if((p[15+j+i]=='g'&&p[15+j+i+1]=='g'))
                                 //if(p[k+11+8+j+14-3]=='t')return
k+11+8+j+14+1;//32 position is 't' only
```

```
                                if(p[k+11+8+j+14-3]=='c'||p[k+11+8+j+14-
3]=='t')return k+11+8+j+14+1+1;

                          //remove // if 18 &19 position are 'ga' or 'gc'
                         //
if(p[15+j+i]=='g'&&p[15+j+i+1]=='a')if(p[k+11+8+j+14-
3]=='c'||p[k+11+8+j+14-3]=='t')return k+11+8+j+14+1+1;
                         //
if((p[15+j+i]=='g'&&p[15+j+i+1]=='c'))if(p[k+11+8+j+14-
3]=='c'||p[k+11+8+j+14-3]=='t')return k+11+8+j+14+1+1;
                    }


                    else
                    {
                          for(i=k-2;i<3;++i)
                    {
                          if((p[15+j+i]=='g'&&p[15+j+i+1]=='g'))
                               // if(p[k+11+8+j+14-3]=='t')return
k+11+8+j+14+1;//32 position is 't' only
                                if(p[k+11+8+j+14-3]=='c'||p[k+11+8+j+14-
3]=='t')return k+11+8+j+14+1+1;

                          //remove // if 18 &19 position are 'ga' or 'gc'

//if(p[15+j+i]=='g'&&p[15+j+i+1]=='a')if(p[k+11+8+j+14-
3]=='c'||p[k+11+8+j+14-3]=='t')return k+11+8+j+14+1+1;

//if((p[15+j+i]=='g'&&p[15+j+i+1]=='c'))if(p[k+11+8+j+14-
3]=='c'||p[k+11+8+j+14-3]=='t')return k+11+8+j+14+1+1;

                    }
                    }


                    flag=0;

                    }
}}



if(flag==0)return 0;



//return 1;

}


int check_2nd(char *p)
{
int i,j,arm_for_t=arm_t,c;

if(p[19]!='g')return 0;
if(p[18]!='a'&&p[18]!='t')return 0;
if(p[16]!='c')return 0;
if(p[11]!='c')return 0;
```

```
j=23;
for( i=7;i<12;++i)

{
      c=check_bond(p[j],p[i]);
      if( c==0){return 0;};//T -arm

      if( c==2)
      {
                  arm_for_t--;if(arm_for_t<0){return 0;}
      }
j--;
}







return 1;
}









int build_trna_cg(char *p,int l1,char mat[32][80],char *anticodon, char
*bp,char *a_arm,char *d_arm,char *ac_arm,char *t_arm)
{
      int
i=0,j,k,m,n,u,v,w,x,l=0,flag=0,m1,u1,n1,w1,x1,i1,i2,m2,u2,n2,w2,x2;
      int
arm_for_a=arm_a,arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;
      u=0;j=0;
      //printf("%s\n",p); getch();
      while(i<7)
      {
            v=14;//printf("OK\n");printf("%c %c\n",p[i],p[l-i-1]);
            if( check_bond(p[i],p[l1-i-1])==0)return 0; // A - arm

            mat[u][v++]=a_arm[j++]=p[i];

            if(check_bond(p[i],p[l1-i-1])==1)
            mat[u][v++]='-';
            else
            {
                  mat[u][v++]='+';
                  arm_for_a--;if(arm_for_a<0)return 0;
            }
            mat[u++][v]=a_arm[j++]=p[l1-i-1];
            i++;
      }

      w=w1=w2=u-1;

      if(p[i]!='t')return 0;
      bp[7]=p[i];bp[8]=p[i+1];
```

```
      mat[u++][13]=p[i];
      mat[u++][12]=p[i+1];

      n=n1=n2=l1-i-1;

      x=x1=x2=i+5;
      u1=u2=u;
      m2=i;
     j=0;
      i=i1=18;

      /*i=n-16;
      printf("p[%d]=%c\n",i+4,p[i+4]);
      printf("p[%d]=%c\n",i+5,p[i+5]);
      printf("p[%d]=%c\n",i+7,p[i+7]);
      printf("p[%d]=%c\n",i+12,p[i+12]);

            printf("p[%d]=%c\n",m+8,p[m+8]); getch();*/



      while(i1>15)

{

            i=i1;u=u1=u2;w=w1=w2;m=m1=m2;n=n1=n2;x=x1=x2;l=0;v=11;
            arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;




            if((p[i+1]=='c')&&p[i]=='g')//17='g' does not exist
            {


                  //printf("i=%d\n",i);getch();
                  for(i2=u;i2<32;i2++)
for(j=0;j<80;++j)
mat[i2][j]=' ';

//bp[17]=p[i];bp[18]=p[i+1];

      //if(j==3)return 0;
      m=m1=i;
      i+=7;//rintf("%d\n",i);


      j=0;k=m2+2;//v=11;u1=u;
      //printf("Ok %d \n",i); getch();
      while(j<4)
      {

            //printf("OK\n");printf("%c %c\n",p[i],p[k]);


            if( check_bond(p[k],p[i])==0){flag=1;break;} // D - arm with
20

            mat[u++][v]=d_arm[l++]=p[k];
```

```
            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0){flag=1;break;}
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

            i--;k++;j++;

      }


if(flag!=1)
{
bp[20]=p[i];

j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];bp[17]=p[i1];bp[18]=p[i1+1];


   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;//printf("i=%d\n",i);getch();
      j=0;
      k=n;


      if(p[i+4]!='g'){flag=1;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=1;}
      if(p[i+7]!='c'){flag=1;}
      if(p[i+12]!='c'){flag=1;}


//printf("p[%d]=%c\n",i+4,p[i+4]);
//    printf("p[%d]=%c\n",i+5,p[i+5]);
//    printf("p[%d]=%c\n",i+7,p[i+7]);
//    printf("p[%d]=%c\n",i+12,p[i+12]);
//getch();


if(flag!=1)
{
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;
```

```
      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=1;break;};//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=1;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }
}
if(flag!=1)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];




   u=w+6;v=12;



x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%c %c\n",p[i],p[k]);

            if( check_bond(p[k],p[i])==0){flag=1;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=1;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;
```

```
            j++;k--;i++;
      }



      mat[u++][v-1]=bp[31]=p[i++];
      //printf("m=%d\n",m);getch();

      if(p[m+8]!='t'&&p[m+8]!='c'){flag=1;}
      //printf("p[%d]=%c\n",m+8,p[m+8]); getch();

}
      if(flag!=1)
      {
            bp[32]=p[m+8];

      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=1;
```

```
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}


//printf("17 a\n");




if(flag!=1)

if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-arm_for_ac,arm_t-
arm_for_t))return 1;
else return 0;

}
      }



if(flag==1)
{

      arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;
      u=u1;w=w1;m=m1;n=n1;x=x1;l=0;



      for(i=u;i<32;i++)
for(j=0;j<80;++j)
mat[i][j]=' ';


      i=m+8;v=11;
          j=0;k=m2+2;l=0;
           while(j<4)
      {

            //printf("OK\n");printf("%c %c\n",p[i],p[k]);


            if( check_bond(p[k],p[i])==0){flag=2;break;} // D - arm with
20A

            mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0){flag=2;break;}
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;
```

```
            i--;k++;j++;

      }




if(flag!=2)
{
bp[20]=p[i];
j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];//bp[17]=bp[18]='g';

   bp[17]=p[i1];bp[18]=p[i1+1];
   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;
      j=0;
      k=n;


      if(p[i+4]!='g'){flag=2;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=2;}
      if(p[i+7]!='c'){flag=2;}
      if(p[i+12]!='c'){flag=2;}

if(flag!=2)
{
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=2;break;};//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=2;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;
```

```
            j++;k--;i++;
      }
}
if(flag!=2)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];




   u=w+6;v=12;

//printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();

x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%c %c\n",p[i],p[k]);

            if( check_bond(p[k],p[i])==0){flag=2;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=2;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      }



      mat[u++][v-1]=bp[31]=p[i++];

      //printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();
      //if(p[m+8]!='t'){flag=2;}
      if(p[m+8]!='t'&&p[m+8]!='c'){flag=2;}

//printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();
}

      if(flag!=2)
      {
```

```
      bp[32]=p[m+8];
      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=2;
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}


//printf("17 \n");
if(flag!=2)
if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-arm_for_ac,arm_t-
arm_for_t))return 1;
else return 0;

//return 1;
```

```
}
      }
      }
```

```
      if(flag==2)
      {

            u=u1;w=w1;m=m1;n=n1;x=x1;l=0;flag=0;

            for(i=u;i<32;i++)
for(j=0;j<80;++j)
mat[i][j]=' ';


            i=m+9;v=11;arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;

          j=0;k=m2+2;l=0;

               /*if( check_bond(p[k],p[i])==0)return 0; // D - arm having
20A & 20B


               mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else
            {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0)return 0;
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

               i--;k++;j++;
             }
      }
```

```
   j=0;k=x++;//printf("%d %d\n",i,k);getch();
```

```
bp[13]=p[x];bp[14]=p[x+1];bp[17]=bp[18]='g';


while(j<(i-k-2)/2)
{
      mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
}
mat[w+3][v]=p[x++];
mat[w+4][v]=p[x++];
mat[w+5][v]=p[x++];


while(x<=i)

      mat[w+6][++v]=p[x++];


i=n-16;
   j=0;
   k=n;


   if(p[i+4]!='g')return 0;
   if(p[i+5]!='t'&&p[i+5]!='a')return 0;
   if(p[i+7]!='c')return 0;
   if(p[i+12]!='c')return 0;


 mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

   while(j<5)
   {
         if( check_bond(p[k],p[i])==0)return 0;//T -arm


         mat[w++][v]=t_arm[l++]=p[k];

         if(check_bond(p[i],p[k])==1)
         mat[w++][v]='|';
         else
         {
               mat[w++][v]='+';
               arm_for_t--;if(arm_for_t<0)return 0;
         }
         mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

         j++;k--;i++;
   }

mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
mat[w+2][v]=bp[55]=p[i++];
mat[w+1][v]=p[i++];
mat[w][v]=bp[57]=p[i++];




u=w+6;v=12;
```

```
x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%c %c\n",p[i],p[k]);

            if( check_bond(p[k],p[i])==0)return 0;//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0)return 0;
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      }


      mat[u++][v-1]=bp[31]=p[i++];


      if(p[m+8]!='t')return 0;

      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
```

```
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}



      return 1;*/



 while(j<4)
             {

if( check_bond(p[k],p[i])==0){flag=2;break;} // D - arm with 20A&20B

            mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0){flag=2;break;}
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

            i--;k++;j++;

      }




if(flag!=2)
{
```

```
bp[20]=p[i];
j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];//bp[17]=bp[18]='g';
   bp[17]=p[i1];bp[18]=p[i1+1];

   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;
      j=0;
      k=n;


      if(p[i+4]!='g'){flag=2;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=2;}
      if(p[i+7]!='c'){flag=2;}
      if(p[i+12]!='c'){flag=2;}

if(flag!=2)
{
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=2;break;};//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=2;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }
}
if(flag!=2)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];
```

```
   u=w+6;v=12;



x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%d  %d  %c %c\n",i,k,p[i],p[k]);getch();

            if( check_bond(p[k],p[i])==0){flag=2;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=2;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();

      }



      mat[u++][v-1]=bp[31]=p[i++];
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();


      //if(p[m+8]!='t'){flag=2;}
      if(p[m+8]!='t'&&p[m+8]!='c'){flag=2;}
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();

}

      if(flag!=2)
      {
      bp[32]=p[m+8];
      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
```

```
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=2;
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}


//printf("17a exists\n");
if(flag!=2)
      if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-
arm_for_ac,arm_t-arm_for_t))return 1;
else return 0;
//return 1;
}
      }
}



}
i1--;
}
```

```
return 0;

}
```

```
int build_trna_gg(char *p,int l1,char mat[32][80],char *anticodon, char
*bp,char *a_arm,char *d_arm,char *ac_arm,char *t_arm)
{
      int
i=0,j,k,m,n,u,v,w,x,l=0,flag=0,m1,u1,n1,w1,x1,i1,i2,m2,u2,n2,w2,x2;
      int
arm_for_a=arm_a,arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;
      u=0;j=0;
      //printf("%s\n",p); getch();
      while(i<7)
      {
            v=14;//printf("OK\n");printf("%c %c\n",p[i],p[l-i-1]);
            if( check_bond(p[i],p[l1-i-1])==0)return 0; // A - arm

            mat[u][v++]=a_arm[j++]=p[i];

            if(check_bond(p[i],p[l1-i-1])==1)
            mat[u][v++]='-';
            else
            {
                  mat[u][v++]='+';
                  arm_for_a--;if(arm_for_a<0)return 0;
            }
            mat[u++][v]=a_arm[j++]=p[l1-i-1];
            i++;
      }

      w=w1=w2=u-1;

      if(p[i]!='t')return 0;
      bp[7]=p[i];bp[8]=p[i+1];
      mat[u++][13]=p[i];
      mat[u++][12]=p[i+1];

      n=n1=n2=l1-i-1;

      x=x1=x2=i+5;
      u1=u2=u;
      m2=i;
    j=0;
```

```
      i=i1=18;
    while(i1>15)

{

            i=i1;u=u1=u2;w=w1=w2;m=m1=m2;n=n1=n2;x=x1=x2;l=0;v=11;
            arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;




            if((p[i+1]=='g')&&p[i]=='g')//17='g' does not exist
            {


                  //printf("i=%d\n",i);getch();
                  for(i2=u;i2<32;i2++)
for(j=0;j<80;++j)
mat[i2][j]=' ';

//bp[17]=p[i];bp[18]=p[i+1];

      //if(j==3)return 0;
      m=m1=i;
      i+=7;//rintf("%d\n",i);


      j=0;k=m2+2;//v=11;u1=u;
      //printf("Ok %d \n",i); getch();
      while(j<4)
      {

            //printf("OK\n");printf("%c %c\n",p[i],p[k]);


            if( check_bond(p[k],p[i])==0){flag=1;break;} // D - arm with
20

            mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0){flag=1;break;}
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

            i--;k++;j++;

      }


if(flag!=1)
{
bp[20]=p[i];

j=0;k=x++;//printf("%d %d\n",i,k);getch();
```

```
   bp[13]=p[x];bp[14]=p[x+1];bp[17]=p[i1];bp[18]=p[i1+1];


   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;//printf("i=%d\n",i);getch();
      j=0;
      k=n;


      if(p[i+4]!='g'){flag=1;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=1;}
      if(p[i+7]!='c'){flag=1;}
      if(p[i+12]!='c'){flag=1;}


if(flag!=1)
{
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=1;break;};//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=1;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }
}
if(flag!=1)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];
```

```
   u=w+6;v=12;



x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%c %c\n",p[i],p[k]);

            if( check_bond(p[k],p[i])==0){flag=1;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=1;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      }



      mat[u++][v-1]=bp[31]=p[i++];
      //printf("m=%d\n",m);getch();

      if(p[m+8]!='t'&&p[m+8]!='c'){flag=1;}
//printf("p[%d]=%c\n",m+8,p[m+8]); getch();
}
      if(flag!=1)
      {
            bp[32]=p[m+8];

      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];
```

```
      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=1;
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}


//printf("17 a\n");




if(flag!=1)

if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-arm_for_ac,arm_t-
arm_for_t))return 1;
else return 0;

}
      }



if(flag==1)
{
```

```
      arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;
      u=u1;w=w1;m=m1;n=n1;x=x1;l=0;



      for(i=u;i<32;i++)
for(j=0;j<80;++j)
mat[i][j]=' ';


      i=m+8;v=11;
          j=0;k=m2+2;l=0;
           while(j<4)
      {

            //printf("OK\n");printf("%c %c\n",p[i],p[k]);


            if( check_bond(p[k],p[i])==0){flag=2;break;} // D - arm with
20A

            mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0){flag=2;break;}
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

            i--;k++;j++;

      }




if(flag!=2)
{
bp[20]=p[i];
j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];//bp[17]=bp[18]='g';

   bp[17]=p[i1];bp[18]=p[i1+1];
   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];
```

```
   i=n-16;
      j=0;
      k=n;


      if(p[i+4]!='g'){flag=2;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=2;}
      if(p[i+7]!='c'){flag=2;}
      if(p[i+12]!='c'){flag=2;}

if(flag!=2)
{
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=2;break;};//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=2;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }
}
if(flag!=2)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];




   u=w+6;v=12;

//printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();

x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
```

```
            //printf("%c %c\n",p[i],p[k]);

            if( check_bond(p[k],p[i])==0){flag=2;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=2;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      }



      mat[u++][v-1]=bp[31]=p[i++];

      //printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();
      //if(p[m+8]!='t'){flag=2;}
      if(p[m+8]!='t'&&p[m+8]!='c'){flag=2;}

//printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();
}

      if(flag!=2)
      {
      bp[32]=p[m+8];
      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
```

```
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=2;
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}


//printf("17 \n");
if(flag!=2)
if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-arm_for_ac,arm_t-
arm_for_t))return 1;
else return 0;

//return 1;
}
      }
      }
```

```
      if(flag==2)
      {

            u=u1;w=w1;m=m1;n=n1;x=x1;l=0;flag=0;

            for(i=u;i<32;i++)
for(j=0;j<80;++j)
mat[i][j]=' ';
```

```
          i=m+9;v=11;arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;

         j=0;k=m2+2;l=0;

             /*if( check_bond(p[k],p[i])==0)return 0; // D - arm having
20A & 20B


             mat[u++][v]=d_arm[l++]=p[k];

          if(check_bond(p[i],p[k])==1)
          mat[u++][v]='|';
          else
          {
                mat[u++][v]='+';
                arm_for_d--;
                if(arm_for_d<0)return 0;
          }
          mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

             i--;k++;j++;
           }
     }




   j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];bp[17]=bp[18]='g';


   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;
      j=0;
      k=n;


      if(p[i+4]!='g')return 0;
      if(p[i+5]!='t'&&p[i+5]!='a')return 0;
      if(p[i+7]!='c')return 0;
      if(p[i+12]!='c')return 0;
```

```
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0)return 0;//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0)return 0;
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }

   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];




   u=w+6;v=12;



x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%c %c\n",p[i],p[k]);

            if( check_bond(p[k],p[i])==0)return 0;//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0)return 0;
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;
```

```
            j++;k--;i++;
      }


      mat[u++][v-1]=bp[31]=p[i++];


      if(p[m+8]!='t')return 0;

      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}
```

```
      return 1;*/


 while(j<4)
            {
if( check_bond(p[k],p[i])==0){flag=2;break;} // D - arm with 20A&20B

            mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0){flag=2;break;}
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

            i--;k++;j++;

      }




if(flag!=2)
{
bp[20]=p[i];
j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];//bp[17]=bp[18]='g';
   bp[17]=p[i1];bp[18]=p[i1+1];

   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;
      j=0;
      k=n;


      if(p[i+4]!='g'){flag=2;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=2;}
      if(p[i+7]!='c'){flag=2;}
```

```
      if(p[i+12]!='c'){flag=2;}

if(flag!=2)
{
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=2;break;};//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=2;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }
}
if(flag!=2)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];




   u=w+6;v=12;



x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%d  %d  %c %c\n",i,k,p[i],p[k]);getch();

            if( check_bond(p[k],p[i])==0){flag=2;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
```

```
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=2;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();

      }



      mat[u++][v-1]=bp[31]=p[i++];
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();


      //if(p[m+8]!='t'){flag=2;}
      if(p[m+8]!='t'&&p[m+8]!='c'){flag=2;}
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();

}

      if(flag!=2)
      {
      bp[32]=p[m+8];
      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
```

```
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=2;
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}


//printf("17a exists\n");
if(flag!=2)
      if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-
arm_for_ac,arm_t-arm_for_t))return 1;
else return 0;
//return 1;
}
      }
}


}
i1--;
}


return 0;

}









int build_trna_ag(char *p,int l1,char mat[32][80],char *anticodon, char
*bp,char *a_arm,char *d_arm,char *ac_arm,char *t_arm)
{
      int
i=0,j,k,m,n,u,v,w,x,l=0,flag=0,m1,u1,n1,w1,x1,i1,i2,m2,u2,n2,w2,x2;
      int
arm_for_a=arm_a,arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;
      u=0;j=0;
      //printf("%s\n",p); getch();
      while(i<7)
      {
            v=14;//printf("OK\n");printf("%c %c\n",p[i],p[l-i-1]);
            if( check_bond(p[i],p[l1-i-1])==0)return 0; // A - arm

            mat[u][v++]=a_arm[j++]=p[i];
```

```
            if(check_bond(p[i],p[l1-i-1])==1)
            mat[u][v++]='-';
            else
            {
                  mat[u][v++]='+';
                  arm_for_a--;if(arm_for_a<0)return 0;
            }
            mat[u++][v]=a_arm[j++]=p[l1-i-1];
            i++;
      }

      w=w1=w2=u-1;

      if(p[i]!='t')return 0;
      bp[7]=p[i];bp[8]=p[i+1];
      mat[u++][13]=p[i];
      mat[u++][12]=p[i+1];

      n=n1=n2=l1-i-1;

      x=x1=x2=i+5;
      u1=u2=u;
      m2=i;
    j=0;
      i=i1=18;
    while(i1>15)

{

            i=i1;u=u1=u2;w=w1=w2;m=m1=m2;n=n1=n2;x=x1=x2;l=0;v=11;
            arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;




            if((p[i+1]=='a')&&p[i]=='g')//17='g' does not exist
            {


                  //printf("i=%d\n",i);getch();
                  for(i2=u;i2<32;i2++)
for(j=0;j<80;++j)
mat[i2][j]=' ';

//bp[17]=p[i];bp[18]=p[i+1];

      //if(j==3)return 0;
      m=m1=i;
      i+=7;//rintf("%d\n",i);

      j=0;k=m2+2;//v=11;u1=u;
      //printf("Ok %d \n",i); getch();
      while(j<4)
      {

            //printf("OK\n");printf("%c %c\n",p[i],p[k]);
```

```
            if( check_bond(p[k],p[i])==0){flag=1;break;} // D - arm with
20

            mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0){flag=1;break;}
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

            i--;k++;j++;

      }


if(flag!=1)
{
bp[20]=p[i];
j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];bp[17]=p[i1];bp[18]=p[i1+1];


   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;//printf("i=%d\n",i);getch();
      j=0;
      k=n;


      if(p[i+4]!='g'){flag=1;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=1;}
      if(p[i+7]!='c'){flag=1;}
      if(p[i+12]!='c'){flag=1;}


if(flag!=1)
{
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=1;break;};//T -arm
```

```
            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=1;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }
}
if(flag!=1)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];



   u=w+6;v=12;



x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%c %c\n",p[i],p[k]);

            if( check_bond(p[k],p[i])==0){flag=1;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=1;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      }
```

```
      mat[u++][v-1]=bp[31]=p[i++];
      //printf("m=%d\n",m);getch();

      if(p[m+8]!='t'&&p[m+8]!='c'){flag=1;}

}
      if(flag!=1)
      {bp[32]=p[m+8];

      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=1;
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}
```

```
//printf("17 a\n");




if(flag!=1)
if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-arm_for_ac,arm_t-
arm_for_t))return 1;
else return 0;

}
      }



if(flag==1)
{

      arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;
      u=u1;w=w1;m=m1;n=n1;x=x1;l=0;



      for(i=u;i<32;i++)
for(j=0;j<80;++j)
mat[i][j]=' ';


      i=m+8;v=11;
          j=0;k=m2+2;l=0;
           while(j<4)
      {

            //printf("OK\n");printf("%c %c\n",p[i],p[k]);


            if( check_bond(p[k],p[i])==0){flag=2;break;} // D - arm with
20A

            mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0){flag=2;break;}
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

            i--;k++;j++;

      }
```

```
if(flag!=2)
{
bp[20]=p[i];
j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];//bp[17]=bp[18]='g';

   bp[17]=p[i1];bp[18]=p[i1+1];
   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;
      j=0;
      k=n;


      if(p[i+4]!='g'){flag=2;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=2;}
      if(p[i+7]!='c'){flag=2;}
      if(p[i+12]!='c'){flag=2;}

if(flag!=2)
{
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=2;break;};//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=2;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }
}
if(flag!=2)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
```

```
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];



   u=w+6;v=12;

//printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();

x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%c %c\n",p[i],p[k]);

            if( check_bond(p[k],p[i])==0){flag=2;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=2;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      }



      mat[u++][v-1]=bp[31]=p[i++];

      //printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();
      //if(p[m+8]!='t'){flag=2;}
      if(p[m+8]!='t'&&p[m+8]!='c'){flag=2;}

//printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();
}

      if(flag!=2)
      {
bp[32]=p[m+8];
      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';
```

```
      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=2;
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}


//printf("17 \n");
if(flag!=2)
if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-arm_for_ac,arm_t-
arm_for_t))return 1;
else return 0;

//return 1;
}
      }
      }
```

```
      if(flag==2)
      {

            u=u1;w=w1;m=m1;n=n1;x=x1;l=0;flag=0;

            for(i=u;i<32;i++)
for(j=0;j<80;++j)
mat[i][j]=' ';


            i=m+9;v=11;arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;

          j=0;k=m2+2;l=0;

               /*if( check_bond(p[k],p[i])==0)return 0; // D - arm having
20A & 20B


               mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else
            {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0)return 0;
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

               i--;k++;j++;
             }
      }




   j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];bp[17]=bp[18]='g';


   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
```

```
    }
    mat[w+3][v]=p[x++];
    mat[w+4][v]=p[x++];
    mat[w+5][v]=p[x++];


    while(x<=i)

          mat[w+6][++v]=p[x++];


    i=n-16;
       j=0;
       k=n;


       if(p[i+4]!='g')return 0;
       if(p[i+5]!='t'&&p[i+5]!='a')return 0;
       if(p[i+7]!='c')return 0;
       if(p[i+12]!='c')return 0;


     mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

       while(j<5)
       {
             if( check_bond(p[k],p[i])==0)return 0;//T -arm


             mat[w++][v]=t_arm[l++]=p[k];

             if(check_bond(p[i],p[k])==1)
             mat[w++][v]='|';
             else
             {
                   mat[w++][v]='+';
                   arm_for_t--;if(arm_for_t<0)return 0;
             }
             mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

             j++;k--;i++;
       }

    mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
    mat[w+2][v]=bp[55]=p[i++];
    mat[w+1][v]=p[i++];
    mat[w][v]=bp[57]=p[i++];




    u=w+6;v=12;



x--;

       m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
       i=m+2;
       w=u;l=0;
```

```
	j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
	while(j<5)
	{

		//printf("OK\n");
		//printf("%c %c\n",p[i],p[k]);

		if( check_bond(p[k],p[i])==0)return 0;//AC -arm

		mat[u][v++]=ac_arm[l++]=p[i];

		if(check_bond(p[i],p[k])==1)
		mat[u][v++]='-';
		else
		{
				mat[u][v++]='+';
			arm_for_ac--;if(arm_for_ac<0)return 0;
		}
		mat[u++][v]=ac_arm[l++]=p[k];v-=2;


		j++;k--;i++;
	}


	mat[u++][v-1]=bp[31]=p[i++];


	if(p[m+8]!='t')return 0;

	mat[u++][v-1]=p[i++];j=0;
	mat[u][v++]=anticodon[j++]=p[i++];
	mat[u][v++]=anticodon[j++]=p[i++];
	mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

	while(i<=k)
	mat[--u][v]=p[i++];

	bp[37]=p[k];



	v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
```

```
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}



      return 1;*/



 while(j<4)
             {

if( check_bond(p[k],p[i])==0){flag=2;break;} // D - arm with 20A&20B

            mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0){flag=2;break;}
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

            i--;k++;j++;

      }




if(flag!=2)
{
bp[20]=p[i];
j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];//bp[17]=bp[18]='g';
   bp[17]=p[i1];bp[18]=p[i1+1];
```

```
   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[k++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;
      j=0;
      k=n;


      if(p[i+4]!='g'){flag=2;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=2;}
      if(p[i+7]!='c'){flag=2;}
      if(p[i+12]!='c'){flag=2;}

if(flag!=2)
{
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=2;break;};//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=2;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }
}
if(flag!=2)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];




   u=w+6;v=12;
```

```
x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%d  %d  %c %c\n",i,k,p[i],p[k]);getch();

            if( check_bond(p[k],p[i])==0){flag=2;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=2;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();

      }



      mat[u++][v-1]=bp[31]=p[i++];
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();


      //if(p[m+8]!='t'){flag=2;}
      if(p[m+8]!='t'&&p[m+8]!='c'){flag=2;}
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();

}

      if(flag!=2)
      {
bp[32]=p[m+8];
      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];
```

```
      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=2;
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}


//printf("17a exists\n");
if(flag!=2)
if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-arm_for_ac,arm_t-
arm_for_t))return 1;
else return 0;
//return 1;
}
      }
}


}
i1--;
}


return 0;

}
```

```
int build_trna9abs(char *p,int l1,char mat[32][80],char *anticodon, char
*bp,char *a_arm,char *d_arm,char *ac_arm,char *t_arm)
{
      int
i=0,j,k,m,n,u,v,w,x,l=0,flag=0,m1,u1,n1,w1,x1,i1,i2,m2,u2,n2,w2,x2;
      int
arm_for_a=arm_a,arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;
      u=0;j=0;
      //printf("%s\n",p); getch();
      while(i<7)
      {
            v=14;//printf("OK\n");printf("%c %c\n",p[i],p[l-i-1]);
            if( check_bond(p[i],p[l1-i-1])==0)return 0; // A - arm

            mat[u][v++]=a_arm[j++]=p[i];

            if(check_bond(p[i],p[l1-i-1])==1)
            mat[u][v++]='-';
            else
            {
                  mat[u][v++]='+';
                  arm_for_a--;if(arm_for_a<0)return 0;
            }
            mat[u++][v]=a_arm[j++]=p[l1-i-1];
            i++;
      }

      w=w1=w2=u-1;

      if(p[i]!='t')return 0;
      bp[7]=p[i];bp[8]='-';
      mat[u++][13]=p[i];

      //mat[u++][12]=p[i+1];

      n=n1=n2=l1-i-1;

      x=x1=x2=i+4;
      u1=u2=u;
      m2=i-1;
    j=0;
      i=i1=17;
    while(i1>14)
```

```
{

            i=i1;u=u1=u2;w=w1=w2;m=m1=m2;n=n1=n2;x=x1=x2;l=0;v=11;
            arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;




            if((p[i+1]=='g'||p[i+1]=='a')&&p[i]=='g')//17='g' does not
exist
            {


                  //printf("i=%d\n",i);getch();
                  for(i2=u;i2<32;i2++)
for(j=0;j<80;++j)
mat[i2][j]=' ';

//bp[17]=p[i];bp[18]=p[i+1];

      //if(j==3)return 0;
      m=m1=i;
      i+=7;//rintf("%d\n",i);

      j=0;k=m2+2;//v=11;u1=u;
      //printf("Ok %d \n",i); getch();
      while(j<4)
      {

            //printf("OK\n");printf("%c %c\n",p[i],p[k]);


            if( check_bond(p[k],p[i])==0){flag=1;break;} // D - arm with
20

            mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0){flag=1;break;}
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

            i--;k++;j++;

      }


if(flag!=1)
{
bp[20]=p[i];
j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];bp[17]=p[i1];bp[18]=p[i1+1];
```

```
   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;//printf("i=%d\n",i);getch();
      j=0;
      k=n;


      if(p[i+4]!='g'){flag=1;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=1;}
      if(p[i+7]!='c'){flag=1;}
      if(p[i+12]!='c'){flag=1;}


if(flag!=1)
{
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=1;break;};//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=1;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }
}
if(flag!=1)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];




   u=w+6;v=12;
```

```
x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%c %c\n",p[i],p[k]);

            if( check_bond(p[k],p[i])==0){flag=1;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=1;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      }



      mat[u++][v-1]=bp[31]=p[i++];
      //printf("m=%d\n",m);getch();

      //if(p[m+8]!='t'&&p[m+8]!='c'){flag=1;}
      if(p[m+8]!='t'){flag=1;}

}
      if(flag!=1)
      {
bp[32]=p[m+8];
      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
```

```
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=1;
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}


//printf("17 a\n");




if(flag!=1)
if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-arm_for_ac,arm_t-
arm_for_t))return 1;
else return 0;
}
      }



if(flag==1)
{

      arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;
      u=u1;w=w1;m=m1;n=n1;x=x1;l=0;
```

```
      for(i=u;i<32;i++)
for(j=0;j<80;++j)
mat[i][j]=' ';


      i=m+8;v=11;
          j=0;k=m2+2;l=0;
           while(j<4)
      {

            //printf("OK\n");printf("%c %c\n",p[i],p[k]);


            if( check_bond(p[k],p[i])==0){flag=2;break;} // D - arm with
20A

            mat[u++][v]=d_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[u++][v]='|';
            else {
                  mat[u++][v]='+';
                  arm_for_d--;
                  if(arm_for_d<0){flag=2;break;}
            }
            mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

            i--;k++;j++;

      }




if(flag!=2)
{
bp[20]=p[i];
j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];//bp[17]=bp[18]='g';

   bp[17]=p[i1];bp[18]=p[i1+1];
   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;
      j=0;
      k=n;
```

```
      if(p[i+4]!='g'){flag=2;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=2;}
      if(p[i+7]!='c'){flag=2;}
      if(p[i+12]!='c'){flag=2;}

if(flag!=2)
{
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=2;break;};//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=2;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }
}
if(flag!=2)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];




   u=w+6;v=12;

//printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();

x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%c %c\n",p[i],p[k]);

            if( check_bond(p[k],p[i])==0){flag=2;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];
```

```
            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=2;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      }



      mat[u++][v-1]=bp[31]=p[i++];

      //printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();
      //if(p[m+8]!='t'){flag=2;}
      //if(p[m+8]!='t'&&p[m+8]!='c'){flag=2;}
      if(p[m+8]!='t'){flag=2;}

//printf("%d %c  flag=%d\n",m+8,p[m+8],flag);getch();
}

      if(flag!=2)
      {
bp[32]=p[m+8];
      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
```

```
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=2;
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}


//printf("17 \n");
if(flag!=2)
if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-arm_for_ac,arm_t-
arm_for_t))return 1;
else return 0;

//return 1;
}
      }
      }
```

```
      if(flag==2)
      {

            u=u1;w=w1;m=m1;n=n1;x=x1;l=0;flag=0;

            for(i=u;i<32;i++)
for(j=0;j<80;++j)
mat[i][j]=' ';


            i=m+9;v=11;arm_for_d=arm_d,arm_for_ac=arm_ac,arm_for_t=arm_t;
```

```
          j=0;k=m2+2;l=0;

               /*if( check_bond(p[k],p[i])==0)return 0; // D - arm having
20A & 20B


               mat[u++][v]=d_arm[l++]=p[k];

             if(check_bond(p[i],p[k])==1)
             mat[u++][v]='|';
             else
             {
                   mat[u++][v]='+';
                   arm_for_d--;
                   if(arm_for_d<0)return 0;
             }
             mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

                i--;k++;j++;
              }
      }




   j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];bp[17]=bp[18]='g';


   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;
      j=0;
      k=n;


      if(p[i+4]!='g')return 0;
      if(p[i+5]!='t'&&p[i+5]!='a')return 0;
      if(p[i+7]!='c')return 0;
      if(p[i+12]!='c')return 0;


    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
```

```
            if( check_bond(p[k],p[i])==0)return 0;//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0)return 0;
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }

   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];




   u=w+6;v=12;



x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%c %c\n",p[i],p[k]);

            if( check_bond(p[k],p[i])==0)return 0;//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0)return 0;
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;


            j++;k--;i++;
      }
```

```
      mat[u++][v-1]=bp[31]=p[i++];


      if(p[m+8]!='t')return 0;

      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}



      return 1;*/
```

```
 while(j<4)
            {

if( check_bond(p[k],p[i])==0){flag=2;break;} // D - arm with 20A&20B

           mat[u++][v]=d_arm[l++]=p[k];

           if(check_bond(p[i],p[k])==1)
           mat[u++][v]='|';
           else {
                 mat[u++][v]='+';
                 arm_for_d--;
                 if(arm_for_d<0){flag=2;break;}
           }
           mat[u++][v]=d_arm[l++]=p[i];v--;u-=3;

           i--;k++;j++;

      }




if(flag!=2)
{
bp[20]=p[i];
j=0;k=x++;//printf("%d %d\n",i,k);getch();

   bp[13]=p[x];bp[14]=p[x+1];//bp[17]=bp[18]='g';
   bp[17]=p[i1];bp[18]=p[i1+1];

   while(j<(i-k-2)/2)
   {
         mat[w+2][v]=p[x++];v--;j++;//printf("OK\n");
   }
   mat[w+3][v]=p[x++];
   mat[w+4][v]=p[x++];
   mat[w+5][v]=p[x++];


   while(x<=i)

         mat[w+6][++v]=p[x++];


   i=n-16;
      j=0;
      k=n;


      if(p[i+4]!='g'){flag=2;}
      if(p[i+5]!='t'&&p[i+5]!='a'){flag=2;}
      if(p[i+7]!='c'){flag=2;}
      if(p[i+12]!='c'){flag=2;}

if(flag!=2)
{
```

```
    mat[w][22]=p[k-5];mat[w][23]=p[k-6];v=17;w++;l=0;

      while(j<5)
      {
            if( check_bond(p[k],p[i])==0){flag=2;break;};//T -arm


            mat[w++][v]=t_arm[l++]=p[k];

            if(check_bond(p[i],p[k])==1)
            mat[w++][v]='|';
            else
            {
                  mat[w++][v]='+';
                  arm_for_t--;if(arm_for_t<0){flag=2;break;}
            }
            mat[w++][v]=t_arm[l++]=p[i];v++;w-=3;

            j++;k--;i++;
      }
}
if(flag!=2)
{
   mat[w+3][v++]=bp[53]=p[i++];mat[w+3][v++]=bp[54]=p[i++];
   mat[w+2][v]=bp[55]=p[i++];
   mat[w+1][v]=p[i++];
   mat[w][v]=bp[57]=p[i++];




   u=w+6;v=12;



x--;

      m=x+4;mat[--u][v++]=bp[25]=p[m+1];u++;
      i=m+2;
      w=u;l=0;

      j=0;k=i+16;x=k+1;//printf("%d %d\n",i,k);
      while(j<5)
      {

            //printf("OK\n");
            //printf("%d  %d  %c %c\n",i,k,p[i],p[k]);getch();

            if( check_bond(p[k],p[i])==0){flag=2;break;}//AC -arm

            mat[u][v++]=ac_arm[l++]=p[i];

            if(check_bond(p[i],p[k])==1)
            mat[u][v++]='-';
            else
            {
                        mat[u][v++]='+';
                  arm_for_ac--;if(arm_for_ac<0){flag=2;break;}
            }
            mat[u++][v]=ac_arm[l++]=p[k];v-=2;
```

```
            j++;k--;i++;
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();

      }



      mat[u++][v-1]=bp[31]=p[i++];
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();


      //if(p[m+8]!='t'){flag=2;}
      //if(p[m+8]!='t'&&p[m+8]!='c'){flag=2;}
      if(p[m+8]!='t'){flag=2;}
      //printf("%d  %c   flag=%d\n",m+8,p[m+8],flag);getch();

}

      if(flag!=2)
      {
bp[32]=p[m+8];
      mat[u++][v-1]=p[i++];j=0;
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];
      mat[u][v++]=anticodon[j++]=p[i++];anticodon[j]='\0';

      while(i<=k)
      mat[--u][v]=p[i++];

      bp[37]=p[k];



      v=16;
k=n-17;
j=0;
i=x;
bp[43]=p[i];bp[47]=p[k];
u=ceil((k-x+1)/2.0)-2;//printf("%d %d % d\n",k,x, u);
if(u>0){
while(j<=u){mat[w++][v++]=p[i++];j++;}

w--;
j=0;
while(j<=u/2+1)
{
  mat[--w][v]=p[i++];j++;
}
v--;
if(j<=u)
{
while(j<=u)
{
   mat[--w][v]=p[i++];
   j++;
}
v--;
}
```

```
else v+=1;
while(i<=k)
mat[--w][v--]=p[i++];

}
else
{if(u<0)flag=2;
      mat[w][v++]=p[i++];
      mat[w][v++]=p[i++];

while(i<=k)
mat[--w][v--]=p[i++];
}


//printf("17a exists\n");

if(flag!=2)
if(check3dbp(bp,arm_a-arm_for_a,arm_d-arm_for_d,arm_ac-arm_for_ac,arm_t-
arm_for_t))return 1;
else return 0;
//return 1;
}
      }
}


}
i1--;
}


return 0;

}









int display(char mat[32][80],char *anti,char *bp,char *a_arm,char
*d_arm,char *ac_arm,char *t_arm,FILE *f,FILE *f1,int start,int end,int
start1,int end1,char *p2,char *p4,char *p3,char *sp1,char *sp2,char
*sp3,char *sp4,char *p,int add,char *st1,char *st2,char *bh1,char
*bh2,char *top)

{
      //static int k=1;

      char
acid[64][5]={"Phe","Phe","Leu","Leu","Ser","Ser","Ser","Ser","Cys","Cys",

      "Trp","Sec","Tyr","Tyr","Stop","Stop","Leu","Leu","Leu","Leu","Pro"
,"Pro","Pro",
```

```
      "Pro","Arg","Arg","Arg","Arg","His","His","Gln","Gln","Val","Val","
Val","Val",

      "Ala","Ala","Ala","Ala","Gly","Gly","Gly","Gly","Asp","Asp","Glu","
Glu","Ile",

      "Ile","Met","Ile","Thr","Thr","Thr","Thr","Ser","Ser","Arg","Arg","
Asn","Asn",
            "Lys","Lys"};

      char anticodon[64][5]={

      "aaa","gaa","caa","taa","aga","gga","cga","tga","aca","gca","cca","
tca","ata","gta",

      "cta","tta","aag","gag","cag","tag","agg","ggg","cgg","tgg","acg","
gcg","ccg","tcg",

      "atg","gtg","ctg","ttg","aac","gac","cac","tac","agc","ggc","cgc","
tgc","acc","gcc",

      "ccc","tcc","atc","gtc","ctc","ttc","aat","gat","cat","tat","agt","
ggt","cgt","tgt",
            "act","gct","cct","tct","att","gtt","ctt","ttt"};

      int i,j,k;


if(start1<=end&&start1>=start)return 0;
if(start<=end1&&start>=start1)return 0;

if(strcmp(top,"acca")!=0&&strcmp(top,"ccca")!=0&&strcmp(top,"tcca")!=0&&s
trcmp(top,"gcca")!=0)return 0;//tRNA gulo acca,or  tcca,or ccca, or gcca
      fprintf(f,"%d.\n",no++);

      j=strlen(top);

for(i=j-1;i>=0;--i)
{
for(k=0;k<16;++k)
fprintf(f," ");
fprintf(f,"%c\n",top[i]);
}
      for(i=0;i<32;++i)
      {     for(j=0;j<80;++j)
                  fprintf(f,"%c",mat[i][j]);
      fprintf(f,"\n");
      }


      for(i=0;i<64;++i)
            if(strcmp(anti,anticodon[i])==0)
            {
                  fprintf(f,"trna - %s ( %s
)\n",acid[i],anticodon[i]);fprintf(f,"trna length - %d\n",LENGTH);

                  fprintf(f1,"%s\t%s\t\t",acid[i],anticodon[i]);
            }
```

```
if(start1-1==end)
      fprintf(f,"trna sequence (%d -  %d)\n\n\n",start,end1);
else
      fprintf(f,"trna sequence (%d - %d,%d -
%d)\n\n\n",start,end,start1,end1);

fprintf(f1,"%s\t%c-%c\t%c-%c\t%c-%c\t%c-%c\t%c-%c\t%c-%c\t%c-%c\t
",p4,a_arm[0],a_arm[1],a_arm[2],a_arm[3],a_arm[4],a_arm[5],a_arm[6],a_arm
[7],a_arm[8],a_arm[9],a_arm[10],a_arm[11],a_arm[12],a_arm[13]);
fprintf(f1,"%c-%c\t %c-%c\t %c-%c\t %c-%c\t
",d_arm[0],d_arm[1],d_arm[2],d_arm[3],d_arm[4],d_arm[5],d_arm[6],d_arm[7]
);
fprintf(f1,"%c-%c\t %c-%c\t %c-%c\t %c-%c\t %c-%c\t
",ac_arm[0],ac_arm[1],ac_arm[2],ac_arm[3],ac_arm[4],ac_arm[5],ac_arm[6],a
c_arm[7],ac_arm[8],ac_arm[9]);
fprintf(f1,"%c-%c\t %c-%c\t %c-%c\t %c-%c\t %c-%c\t
",t_arm[1],t_arm[0],t_arm[3],t_arm[2],t_arm[5],t_arm[4],t_arm[7],t_arm[6]
,t_arm[9],t_arm[8]);


fprintf(f1,"%c-%c\t %c-%c\t %c-%c\t %c-%c\t %c-%c\t %c-%c\t %c-
%c\t%c\t%c\t%c\t%s\t%40s\t",bp[7],bp[13],bp[14],bp[47],bp[17],bp[54],bp[1
8],bp[55],bp[25],bp[43],bp[31],bp[37],bp[53],bp[57],bp[8],bp[20],bp[32],p
2,p3);

if(start1-1==end)
{
      for(i=0;i<20;i++)
      sp2[i]=sp3[i]='-';sp2[i]=sp3[i]='\0';
}


fprintf(f1,"%s\t%s\t%s\t%s\t%s\t%s\t%s\t%s\t%s\t",sp1,sp2,sp3,sp4,p,st1,s
t2,bh1,bh2);

if(add==1)fprintf(f1,"%s\n","Mathing 1st and 4th");
else if(add==2)fprintf(f1,"%s\n","Exists bh loop");
else if (add==3)fprintf(f1,"%s\n","Mathing 1st and 4th AND Exists bh
loop");
else if (add==4)fprintf(f1,"%s\n","Mathing 1st and 4th AND  bh loop does
not exist");


fflush(f);
fflush(f1);
}









int  cdisplay(char mat[32][80],char *anti,char *bp,char *a_arm,char
*d_arm,char *ac_arm,char *t_arm,FILE *f,FILE *f1,int start,int end,int
start1,int end1,char *p2,char *p4,char *p3,char *sp1,char *sp2,char
*sp3,char *sp4,char *p,int add,char *st1,char *st2,char *bh1,char
*bh2,char *top)
```

```
{
      //static int k=1;

      char
acid[64][5]={"Phe","Phe","Leu","Leu","Ser","Ser","Ser","Ser","Cys","Cys",

      "Trp","Sec","Tyr","Tyr","Stop","Stop","Leu","Leu","Leu","Leu","Pro"
,"Pro","Pro",

      "Pro","Arg","Arg","Arg","Arg","His","His","Gln","Gln","Val","Val","
Val","Val",

      "Ala","Ala","Ala","Ala","Gly","Gly","Gly","Gly","Asp","Asp","Glu","
Glu","Ile",

      "Ile","Met","Ile","Thr","Thr","Thr","Thr","Ser","Ser","Arg","Arg","
Asn","Asn",
            "Lys","Lys"};

      char anticodon[64][5]={

      "aaa","gaa","caa","taa","aga","gga","cga","tga","aca","gca","cca","
tca","ata","gta",

      "cta","tta","aag","gag","cag","tag","agg","ggg","cgg","tgg","acg","
gcg","ccg","tcg",

      "atg","gtg","ctg","ttg","aac","gac","cac","tac","agc","ggc","cgc","
tgc","acc","gcc",

      "ccc","tcc","atc","gtc","ctc","ttc","aat","gat","cat","tat","agt","
ggt","cgt","tgt",
            "act","gct","cct","tct","att","gtt","ctt","ttt"};

      int i,j,k;

if(end<=end1&&start1<=end)return 0;
if(start<=end1&&start1<=start)return 0;
if(strcmp(top,"acca")!=0&&strcmp(top,"gcca")!=0&&strcmp(top,"tcca")!=0&&s
trcmp(top,"ccca")!=0)return 0;//tRNA gulo acca,or  tcca,or ccca, or gcca
fprintf(f,"%d.\n",no++);

j=strlen(top);

for(i=j-1;i>=0;--i)
{
for(k=0;k<16;++k)
fprintf(f," ");
fprintf(f,"%c\n",top[i]);
}


      for(i=0;i<32;++i)
      {     for(j=0;j<80;++j)
                  fprintf(f,"%c",mat[i][j]);
      fprintf(f,"\n");
      }


      for(i=0;i<64;++i)
```

```
            if(strcmp(anti,anticodon[i])==0)
            {
                  fprintf(f,"trna - %s ( %s
)\n",acid[i],anticodon[i]);fprintf(f,"trna length - %d\n",LENGTH);

                  fprintf(f1,"%s\t%s\t\t",acid[i],anticodon[i]);
            }


if(start-1==end1)
      fprintf(f,"trna sequence complement(%d -  %d)\n\n\n",start1,end);
else
      fprintf(f,"trna sequence complement(%d - %d,%d -
%d)\n\n\n",start1,end1,start,end);


fprintf(f1,"%s\t%c-%c\t%c-%c\t%c-%c\t%c-%c\t%c-%c\t%c-%c\t%c-%c\t%c-%c\t
",p4,a_arm[0],a_arm[1],a_arm[2],a_arm[3],a_arm[4],a_arm[5],a_arm[6],a_arm
[7],a_arm[8],a_arm[9],a_arm[10],a_arm[11],a_arm[12],a_arm[13]);
fprintf(f1,"%c-%c\t %c-%c\t %c-%c\t %c-%c\t
",d_arm[0],d_arm[1],d_arm[2],d_arm[3],d_arm[4],d_arm[5],d_arm[6],d_arm[7]
);
fprintf(f1,"%c-%c\t %c-%c\t %c-%c\t %c-%c\t %c-%c\t
",ac_arm[0],ac_arm[1],ac_arm[2],ac_arm[3],ac_arm[4],ac_arm[5],ac_arm[6],a
c_arm[7],ac_arm[8],ac_arm[9]);
fprintf(f1,"%c-%c\t %c-%c\t %c-%c\t %c-%c\t %c-%c\t
",t_arm[1],t_arm[0],t_arm[3],t_arm[2],t_arm[5],t_arm[4],t_arm[7],t_arm[6]
,t_arm[9],t_arm[8]);


fprintf(f1,"%c-%c\t %c-%c\t %c-%c\t %c-%c\t %c-%c\t %c-%c\t %c-
%c\t%c\t%c\t%c\t%s\t%40s\t",bp[7],bp[13],bp[14],bp[47],bp[17],bp[54],bp[1
8],bp[55],bp[25],bp[43],bp[31],bp[37],bp[53],bp[57],bp[8],bp[20],bp[32],p
2,p3);

if(start-1==end1)
{
      for(i=0;i<20;i++)
      sp2[i]=sp3[i]='-';sp2[i]=sp3[i]='\0';
}


fprintf(f1,"%s\t%s\t%s\t%s\t%s\t%s\t%s\t%s\t%s\t",sp1,sp2,sp3,sp4,p,st1,s
t2,bh1,bh2);
if(add==2)fprintf(f1,"%s\n","Mathing 1st and 4th");
else if(add==1)fprintf(f1,"%s\n","Exists bh loop");
else if (add==3)fprintf(f1,"%s\n","Mathing 1st and 4th AND Exists bh
loop");
else if (add==4)fprintf(f1,"%s\n","Mathing 1st and 4th AND  bh loop does
not exist");


fflush(f);
fflush(f1);
}



/*promo(char *p,int l,char *p4)
{
```

```
      int i,j,k;
      for(i=0;i<6;++i)p4[i]='-';
      p4[i]='\0';
      for(i=0;i<l-6;i++)
      {
            if(p[i]=='a'||p[i]=='t')

            if(p[i+1]!='g'&&p[i+1]!='c')

                  if(p[i+2]!='g'&&p[i+2]!='c')
                        if(p[i+3]!='g'&&p[i+3]!='c')
                              if(p[i+4]!='g'&&p[i+4]!='c')
                                    if(p[i+5]=='c'||p[i+5]=='t')
                                    {
                                          k=0;
                                          for(j=i+5;j>=i;--j)p4[k++]=p[j];
                                                p4[k]='\0';
                                                return 0;

                                    }
      }
return 0;
}

*/







void main()
{




      char
mat[32][80],*p,anti[5],c,bp[64],p2[7]={'\0'},p3[41]={'\0'},p4[7]={'\0'},*
q,*r,*q1;
char a_arm[14],d_arm[8],ac_arm[10],t_arm[10];
      FILE *f2,*f1,*f,*f3,*f4;
      int
n=0,n1=0,i=0,j,l,total=0,k,l1,end,flag=0,l2,total1=0,k1,flag2=0,total2=0,
to,m;
      int pflag=0,o_n,o_n1;
char sp1[61],sp2[21],sp3[21],sp4[61],*cq;
char bh1[16],bh2[16],st1[15],st2[15],top[5];
int add;

FILE *f_h,*s_h,*cf_h,*cs_h;


      f1=fopen("out.txt","a+");
      f=fopen("3d_bp.txt","a+");

      fprintf(f,"Type\tAnticodon\tpromo\t1-72\t2-71\t3-70\t4-69\t5-68\t6-
67\t7-66\t10-25\t11-24\t12-23\t13-22\t27-43\t28-42\t29-41\t30-40\t31-
39\t49-65\t50-64\t51-63\t52-62\t53-61\t8-14\t15-48\t18-55\t19-56\t26-
```

```
44\t32-38\t54-58\t9\t21\t33\tEND  \t\t\tSTART\t\t\t 1st\t\t
2nd\t\t3rd\t\t4th\t\tlength\t\t 11st string\t\t2nd string\t\t
bh1\t\tbh2\t\tstatus\n");

      printf("Enter range :");
      scanf("%d%d",&LENGTH,&end);









//f2=fopen("input.txt","r+b");
//    if(f2==NULL)printf("file not open\n");


//    while(!feof(f2))
//    {
//          c=fgetc(f2);
//          if(c>='a'&&c<='z')break;
//    }



  // l=ftell(f2);l--;fseek(f2,l*sizeof(char),SEEK_SET);


f4=fopen("input.txt","r+b");
      if(f4==NULL)printf("file not open\n");
while(!feof(f4))
      {
            c=    fgetc(f4);
            if(c>='a'&&c<='z'){//fprintf(f3,"%c",c);
            total2++;}
      }

      //fflush(f3);



      //k=ftell(f4);
//    k--;
      //total1=k;

    //f3=fopen("temp.txt","r+b");f2=fopen("input.txt","w+b");

            // fseek(f4,k*sizeof(char),SEEK_SET);


fseek(f4,0*sizeof(char),SEEK_SET);

   to=total2;

   q=(char*)malloc((to+1)*sizeof(char));
   cq=(char*)malloc((to+1)*sizeof(char));

   //printf("Total2=%d\n",total2);
```

```
fclose(f4);



f4=fopen("input.txt","r+b");
      if(f4==NULL)printf("file not open\n");

         i=0;
   while(!feof(f4))

      {
            c=fgetc(f4);//if(feof(f2))break;;

            if(c>='a'&&c<='z')
            {
                  q[i++]=c;//n++;//l2=ftell(f2);

            }

   }
            //if(i>=38)
      //    {

                  q[i]='\0';




if(flag==0)
      {
f3=fopen("temp.txt","w+b");
      fseek(f4,0*sizeof(char),SEEK_SET);
      while(!feof(f4))
      {
            c=    fgetc(f4);
            if(c>='a'&&c<='z'){//fprintf(f3,"%c",c);
            total++;}
      }

      //fflush(f3);



      k=ftell(f4);//printf("k=%d\n",k);getch();

      //fclose(f3);fclose(f2);
      l1=0;
       k--;


    //f3=fopen("temp.txt","r+b");f2=fopen("input.txt","w+b");

             fseek(f4,k*sizeof(char),SEEK_SET);



             do{
             c=fgetc(f4);//printf("%c\n",c);getch();
```

```
            if(c>='a'&&c<='z')
            {
            if(c=='a')
                              c='t';
                        else if(c=='t')
                              c='a';
                        else if(c=='c')
                              c='g';
                        else if(c=='g')
                              c='c';

                        fprintf(f3,"%c",c);
            }
                        k--;
                        fseek(f4,k*sizeof(char),SEEK_SET);
            }while(k>=l1);

      fflush(f3);

      flag=1;
      }
      fclose(f4);
      //f2=fopen("temp.txt","r+b");
      //fclose(f4);

      f4=fopen("temp.txt","r+b");


//total2=0;

//while(!feof(f4))
//    {
///         c=    fgetc(f4);
//          if(c>='a'&&c<='z'){//fprintf(f3,"%c",c);
//          total2++;}
//    }

      //fflush(f3);


//    fseek(f4,0*sizeof(char),SEEK_SET);

   //to=total2;

   //q=(char*)malloc((to)*sizeof(char));


   //printf("Total2=%d\n",total2);

   i=0;
   while(!feof(f4))

      {
            c=fgetc(f4);//if(feof(f2))break;;

            if(c>='a'&&c<='z')
            {
                  cq[i++]=c;//n++;//l2=ftell(f2);
```

```
            }

   }
            //if(i>=38)
      //    {

                  cq[i]='\0';



q1=(char*)malloc((41)*sizeof(char));
r=(char*)malloc((LENGTH-40+6)*sizeof(char));



f_h=fopen("first_half.txt","w+");
cf_h=fopen("comp_first_half.txt","w+");
s_h=fopen("second_half.txt","w+");
cs_h=fopen("comp_second_half.txt","w+");

for(n=0;n<=to-39;n++)
            {
                  j=0;

                  //printf(" n=%d\n",n+1);

                  for(i=n;i<n+40;++i)
                        q1[j++]=q[i];q1[j]='\0';
                  //total2=to;
                  //flag2=0;
                  for(i=5;i>=0;--i)
                  if((l=check_first(q1,j-i))!=0)
                  {
                        //flag2=1;
                        fprintf(f_h,"%d\t%d\n",n,l);

                        break;
                  }
            }


            for(n1=to-1;n1>=LENGTH-40;n1--)
                  {

                        j=0;//flag=0;
                        for(i=n1;j<LENGTH-40;--i)
                        r[j++]=q[i];

                              r[j]='\0';//total2=i+1;

                              if(check_2nd(r)==1)
                              {
                                          fprintf(s_h,"%d\n",n1);
                              }
            }
```

```
for(n=0;n<=to-40;n++)
            {
                  j=0;

                  //printf(" n=%d\n",n+1);

                  for(i=n;i<n+40;++i)
                        q1[j++]=cq[i];q1[j]='\0';
                  //total2=to;
                  //flag2=0;
                  for(i=5;i>=0;--i)
                  if((l=check_first(q1,j-i))!=0)
                  {
                        //flag2=1;
                        fprintf(cf_h,"%d\t%d\n",n,l);

                        break;
                  }
            }


            for(n1=to-1;n1>=LENGTH-40;n1--)
                  {

                        j=0;//flag=0;
                        for(i=n1;j<LENGTH-40;--i)
                        r[j++]=cq[i];

                              r[j]='\0';//total2=i+1;

                              if(check_2nd(r)==1)
                              {
                                          fprintf(cs_h,"%d\n",n1);
                              }
            }


fflush(f_h);
fflush(s_h);
fflush(cf_h);
fflush(cs_h);

fclose(f_h);
fclose(s_h);
fclose(cf_h);
fclose(cs_h);


f_h=fopen("first_half.txt","r+");
cf_h=fopen("comp_first_half.txt","r+");
s_h=fopen("second_half.txt","r+");
cs_h=fopen("comp_second_half.txt","r+");
```

```
   while(LENGTH<=end)
{


        o_n=-1;
         p=(char*)malloc((LENGTH+1)*sizeof(char));

q1=(char*)malloc((41)*sizeof(char));
r=(char*)malloc((LENGTH-40+6)*sizeof(char));

rewind(f_h);


while(!feof(f_h))
{
      fscanf(f_h,"%d%d",&n,&l);if(n==o_n)break;else o_n=n;

                  j=0;

                  //printf(" n=%d\n",n+1);

                  for(i=n;i<n+l;++i)
                        q1[j++]=q[i];q1[j]='\0';rewind(s_h);o_n1=-1;


                  //if(q1[j-4]=='t')
                  //{


                  while(!feof(s_h))
                  {
                  fscanf(s_h,"%d",&n1);if(n1==o_n1)break;else o_n1=n1;
                  j=0;//flag=0;
                        for(i=n1;j<LENGTH-l;--i)
                        r[j++]=q[i];

                              r[j]='\0';total2=i+1;



                  pflag=0;

                  //for(m=0;m<=5;++m)
                  //{
                        for(i=0,j=0;i<strlen(q1);i++)
                        p[j++]=q1[i];
                    //p[j]='\0';


                    for(i=strlen(r)-1;i>=0;--i)
                          p[j++]=r[i];
                    p[j]='\0';
                    //strcat(p,q);
                  //printf("q=%d\n",strlen(q)-m);
                  //printf("r=%d\n",strlen(r)-4+m);
                  //printf("p=%d\n",strlen(p));getch();
```

```
                //printf("OK %s  %d\n",p,strlen(p));getch();


                for(i=0;i<32;++i)
                      for(j=0;j<80;++j)mat[i][j]=' ';
                      for(i=0;i<64;++i)bp[i]=' ';



          //    if(pflag==0)
          //    {


     if(build_trna_gg(p,LENGTH,mat,anti,bp,a_arm,d_arm,ac_arm,t_arm)==1)
                {


                      for(i=n-1,j=0;i>=0&&j<60;--i)
                            sp1[j++]=q[i];
                      sp1[j]='\0';

                      for(i=total2-1,j=0;i>=0&&j<20;--i)
                            sp3[j++]=q[i];
                      sp3[j]='\0';

                      for(i=n+l+1-1,j=0;i<to&&j<20;++i)
                            sp2[j++]=q[i];
                      sp2[j]='\0';

                      for(i=total2+LENGTH-l,j=0;i<to&&j<60;++i)
                            {sp4[j]=q[i];if(j<4)top[j]=q[i];
                      j++;}
                      sp4[j]='\0';j=0;while(top[j++]>='a');top[--
j]='\0';


                      for(i=n+l+1-1-6,j=0;i<to&&j<12;++i)
                            if(n+l==total2)bh1[j++]='-';
                            else
                            bh1[j++]=q[i];
                      bh1[j]='\0';

                      for(i=total2-1,j=0;i>=0&&j<10;--i)
                            if(n+l==total2)bh2[j++]='-';
                            else
                            bh2[j++]=q[i];
                      bh2[j]='\0';
                      add=0;



     if(n+l==total2)add=math_1str_4th(sp1,sp4,st1,st2)>0?4:0;

                            else


     add=bh_loop(bh1,bh2)+math_1str_4th(sp1,sp4,st1,st2);
```

```
                        pflag=1;

//printf("OK1\n"); getch();
                        if(add>1)


      display(mat,anti,bp,a_arm,d_arm,ac_arm,t_arm,f1,f,n+1,n+l,total2+1,
total2+LENGTH-l,p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2,top);
                  }
/*else
if(build_trna_ag(p,LENGTH,mat,anti,bp,a_arm,d_arm,ac_arm,t_arm)==1)
                  {

                        for(i=n-1,j=0;i>=0&&j<60;--i)
                              sp1[j++]=q[i];
                        sp1[j]='\0';

                        for(i=total2-1,j=0;i>=0&&j<20;--i)
                              sp3[j++]=q[i];
                        sp3[j]='\0';

                        for(i=n+l+1-1,j=0;i<to&&j<20;++i)
                              sp2[j++]=q[i];
                        sp2[j]='\0';

                        for(i=total2+LENGTH-l,j=0;i<to&&j<60;++i)
                              sp4[j++]=q[i];
                        sp4[j]='\0';


                        for(i=n+l+1-1-10,j=0;i<to&&j<15;++i)
                              if(n+l==total2)bh1[j++]='-';
                              else
                              bh1[j++]=q[i];
                        bh1[j]='\0';

                        for(i=total2-1+5,j=0;i>=0&&j<15;--i)
                              if(n+l==total2)bh2[j++]='-';
                              else
                              bh2[j++]=q[i];
                        bh2[j]='\0';
                        add=0;


                        if(n+l==total2)add=math_1str_4th(sp1,sp4,st1,st2);

                              else


      add=bh_loop(bh1,bh2)+math_1str_4th(sp1,sp4,st1,st2);
```

```
                        pflag=1;

//printf("OK1\n"); getch();
                        if(add>0)


      display(mat,anti,bp,a_arm,d_arm,ac_arm,t_arm,f1,f,n+1,n+l,total2+1,
total2+LENGTH-l,p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2);
                        }


else if(build_trna_cg(p,LENGTH,mat,anti,bp,a_arm,d_arm,ac_arm,t_arm)==1)
                  {


                  for(i=n-1,j=0;i>=0&&j<60;--i)
                              sp1[j++]=q[i];
                        sp1[j]='\0';

                        for(i=total2-1,j=0;i>=0&&j<20;--i)
                              sp3[j++]=q[i];
                        sp3[j]='\0';

                        for(i=n+l+1-1,j=0;i<to&&j<20;++i)
                              sp2[j++]=q[i];
                        sp2[j]='\0';

                        for(i=total2+LENGTH-l,j=0;i<to&&j<60;++i)
                              sp4[j++]=q[i];
                        sp4[j]='\0';




                  for(i=n+l+1-1-10,j=0;i<to&&j<15;++i)
                              if(n+l==total2)bh1[j++]='-';
                              else
                              bh1[j++]=q[i];
                        bh1[j]='\0';

                        for(i=total2-1+5,j=0;i>=0&&j<15;--i)
                              if(n+l==total2)bh2[j++]='-';
                              else
                              bh2[j++]=q[i];
                        bh2[j]='\0';
                        add=0;


                        if(n+l==total2)add=math_1str_4th(sp1,sp4,st1,st2);

                              else


      add=bh_loop(bh1,bh2)+math_1str_4th(sp1,sp4,st1,st2);
```

```
                        pflag=1;

//printf("OK1\n"); getch();
                        if(add>0)


      display(mat,anti,bp,a_arm,d_arm,ac_arm,t_arm,f1,f,n+1,n+l,total2+1,
total2+LENGTH-l,p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2);
                  }




else if(build_trna9abs(p,LENGTH,mat,anti,bp,a_arm,d_arm,ac_arm,t_arm)==1)
                  {

                  for(i=n-1,j=0;i>=0&&j<60;--i)
                              sp1[j++]=q[i];
                        sp1[j]='\0';

                        for(i=total2-1,j=0;i>=0&&j<20;--i)
                              sp3[j++]=q[i];
                        sp3[j]='\0';

                        for(i=n+l+1-1,j=0;i<to&&j<20;++i)
                              sp2[j++]=q[i];
                        sp2[j]='\0';

                        for(i=total2+LENGTH-l,j=0;i<to&&j<60;++i)
                              sp4[j++]=q[i];
                        sp4[j]='\0';




                  for(i=n+l+1-1-10,j=0;i<to&&j<15;++i)
                              if(n+l==total2)bh1[j++]='-';
                              else
                              bh1[j++]=q[i];
                        bh1[j]='\0';

                        for(i=total2-1+5,j=0;i>=0&&j<15;--i)
                              if(n+l==total2)bh2[j++]='-';
                              else
                              bh2[j++]=q[i];
                        bh2[j]='\0';
                        add=0;


                        if(n+l==total2)add=math_1str_4th(sp1,sp4,st1,st2);

                              else


      add=bh_loop(bh1,bh2)+math_1str_4th(sp1,sp4,st1,st2);
```

```
                        pflag=1;

//printf("OK1\n"); getch();
                        if(add>0)


      display(mat,anti,bp,a_arm,d_arm,ac_arm,t_arm,f1,f,n+1,n+l,total2+1,
total2+LENGTH-l,p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2);
                  }*/

                  }
                  }







rewind(cf_h);

o_n=-1;
            while(!feof(cf_h))
            {
                        fscanf(cf_h,"%d%d",&n,&l);if(n==o_n)break;else
o_n=n;


                  j=0;
                  //printf("complemented n=%d\n",n+1);
                  for(i=n;i<n+l;++i)
                        q1[j++]=cq[i];q1[j]='\0';
                  //total2=to;
                  rewind(cs_h);o_n1=-1;

                  while(!feof(cs_h))
                  {
                  fscanf(cs_h,"%d",&n1);if(n1==o_n1)break;else o_n1=n1;



                        j=0;//flag=0;
                        for(i=n1;j<LENGTH-l;--i)
                        r[j++]=cq[i];

                              r[j]='\0';total2=i+1;







                    pflag=0;//k=--k1;fseek(f4,k*sizeof(char),SEEK_SET);
```

```
//    for(m=0;m<=5;++m)
      //{
            for(i=0,j=0;i<strlen(q1);i++)
                  p[j++]=q1[i];
              //p[j]='\0';


              for(i=strlen(r)-1;i>=0;--i)
                    p[j++]=r[i];
              p[j]='\0';
              //strcat(p,q);




            for(i=0;i<32;++i)
                  for(j=0;j<80;++j)mat[i][j]=' ';
                  for(i=0;i<64;++i)bp[i]=' ';

            //if(pflag==0)
      //    {

if(build_trna_gg(p,LENGTH,mat,anti,bp,a_arm,d_arm,ac_arm,t_arm)==1)
            {



                  pflag=1;


                  for(i=n-1,j=0;i>=0&&j<60;--i)
                        sp1[j++]=cq[i];
                  sp1[j]='\0';

                  for(i=total2-1,j=0;i>=0&&j<20;--i)
                        sp3[j++]=cq[i];
                  sp3[j]='\0';

                  for(i=n+l,j=0;i<to&&j<20;++i)
                        sp2[j++]=cq[i];
                  sp2[j]='\0';

                  for(i=total2+LENGTH-l,j=0;i<to&&j<60;++i)
                  {sp4[j]=cq[i];if(j<4)top[j]=cq[i];j++;}
                  sp4[j]='\0';j=0;while(top[j++]>='a');top[--
j]='\0';



                  for(i=n+l+1-1-6,j=0;i<to&&j<12;++i)
                        if(n+l==total2)bh1[j++]='-';
                        else
                        bh1[j++]=cq[i];
                  bh1[j]='\0';

                  for(i=total2-1,j=0;i>=0&&j<10;--i)
                        if(n+l==total2)bh2[j++]='-';
                        else
                        bh2[j++]=cq[i];
```

```
                        bh2[j]='\0';
                        add=0;


      if(n+l==total2)add=math_1str_4th(sp1,sp4,st1,st2)>0?4:0;

                              else


      add=bh_loop(bh1,bh2)+math_1str_4th(sp1,sp4,st1,st2);









                  if(add>1)


      cdisplay(mat,anti,bp,a_arm,d_arm,ac_arm,t_arm,f1,f,total-
(n+l)+1,total-(n+1)+1,total-(total2+LENGTH-l)+1,total-
(total2),p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2,top);
                   }


/*else
if(build_trna_ag(p,LENGTH,mat,anti,bp,a_arm,d_arm,ac_arm,t_arm)==1)
                   {

                   pflag=1;


                        for(i=n-1,j=0;i>=0&&j<60;--i)
                              sp1[j++]=cq[i];
                        sp1[j]='\0';

                        for(i=total2-1,j=0;i>=0&&j<20;--i)
                              sp3[j++]=cq[i];
                        sp3[j]='\0';

                        for(i=n+l,j=0;i<to&&j<20;++i)
                              sp2[j++]=cq[i];
                        sp2[j]='\0';

                        for(i=total2+LENGTH-l,j=0;i<to&&j<60;++i)
                              sp4[j++]=cq[i];
                        sp4[j]='\0';



                        for(i=n+l+1-1-10,j=0;i<to&&j<15;++i)
                              if(n+l==total2)bh1[j++]='-';
                              else
                              bh1[j++]=cq[i];
```

```
                        bh1[j]='\0';

                        for(i=total2-1+5,j=0;i>=0&&j<15;--i)
                              if(n+l==total2)bh2[j++]='-';
                              else
                              bh2[j++]=cq[i];
                        bh2[j]='\0';
                        add=0;


                        if(n+l==total2)add=math_1str_4th(sp1,sp4,st1,st2);

                              else


      add=bh_loop(bh1,bh2)+math_1str_4th(sp1,sp4,st1,st2);


                        if(add>0)

      cdisplay(mat,anti,bp,a_arm,d_arm,ac_arm,t_arm,f1,f,total-
(n+l)+1,total-(n+1)+1,total-(total2+LENGTH-l)+1,total-
(total2),p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2);
                  }



else if(build_trna_cg(p,LENGTH,mat,anti,bp,a_arm,d_arm,ac_arm,t_arm)==1)
                  {


                  pflag=1;


                  for(i=n-1,j=0;i>=0&&j<60;--i)
                              sp1[j++]=cq[i];
                        sp1[j]='\0';

                        for(i=total2-1,j=0;i>=0&&j<20;--i)
                              sp3[j++]=cq[i];
                        sp3[j]='\0';

                        for(i=n+l,j=0;i<to&&j<20;++i)
                              sp2[j++]=cq[i];
                        sp2[j]='\0';

                        for(i=total2+LENGTH-l,j=0;i<to&&j<60;++i)
                              sp4[j++]=cq[i];
                        sp4[j]='\0';



                        for(i=n+l+1-1-10,j=0;i<to&&j<15;++i)
                              if(n+l==total2)bh1[j++]='-';
                              else
                              bh1[j++]=cq[i];
                        bh1[j]='\0';

                        for(i=total2-1+5,j=0;i>=0&&j<15;--i)
                              if(n+l==total2)bh2[j++]='-';
```

```
                        else
                        bh2[j++]=cq[i];
                    bh2[j]='\0';
                    add=0;


                    if(n+l==total2)add=math_1str_4th(sp1,sp4,st1,st2);

                        else


    add=bh_loop(bh1,bh2)+math_1str_4th(sp1,sp4,st1,st2);



                    if(add>0)

    cdisplay(mat,anti,bp,a_arm,d_arm,ac_arm,t_arm,f1,f,total-
(n+l)+1,total-(n+1)+1,total-(total2+LENGTH-l)+1,total-
(total2),p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2);
                }



else if(build_trna9abs(p,LENGTH,mat,anti,bp,a_arm,d_arm,ac_arm,t_arm)==1)
                {




                 pflag=1;


                    for(i=n-1,j=0;i>=0&&j<60;--i)
                        sp1[j++]=cq[i];
                    sp1[j]='\0';

                    for(i=total2-1,j=0;i>=0&&j<20;--i)
                        sp3[j++]=cq[i];
                    sp3[j]='\0';

                    for(i=n+l,j=0;i<to&&j<20;++i)
                        sp2[j++]=cq[i];
                    sp2[j]='\0';

                    for(i=total2+LENGTH-l,j=0;i<to&&j<60;++i)
                        sp4[j++]=cq[i];
                    sp4[j]='\0';



                    for(i=n+l+1-1-10,j=0;i<to&&j<15;++i)
                        if(n+l==total2)bh1[j++]='-';
                        else
                        bh1[j++]=cq[i];
                    bh1[j]='\0';
```

```
                        for(i=total2-1+5,j=0;i>=0&&j<15;--i)
                              if(n+l==total2)bh2[j++]='-';
                              else
                              bh2[j++]=cq[i];
                        bh2[j]='\0';
                        add=0;


                        if(n+l==total2)add=math_1str_4th(sp1,sp4,st1,st2);

                              else


      add=bh_loop(bh1,bh2)+math_1str_4th(sp1,sp4,st1,st2);


                        if(add>0)

      cdisplay(mat,anti,bp,a_arm,d_arm,ac_arm,t_arm,f1,f,total-
(n+l)+1,total-(n+1)+1,total-(total2+LENGTH-l)+1,total-
(total2),p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2);
                  }*/

                  }
                  }



//fclose(f4);
printf("Length=%d completed\n",LENGTH);
LENGTH++;
}









      printf("Completed\n");getch();







}
```