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#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 arma,armd,armac,arnt,bp_3;

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)

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        {
            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;
    arma=armd=armac=armt=0;

    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();
            arma=a;armd=b;armac=c;armt=d;bp_3=bp3d-bp3;;
            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;

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//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=0;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'))

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if((p[15+j+i]=='g'&& p[15+j+i+1]=='g') || (p[15+j+i]=='c'&& p[15+j+i+1]=='g')
|| (p[15+j+i]=='a'&& 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; //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[15+j+i]=='g'&& p[15+j+i+1]=='g') || (p[15+j+i]=='g'&& p[15+j+i+1]=='c')
|| (p[15+j+i]=='g'&& p[15+j+i+1]=='a'))
    // 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; //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;
}

```

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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[l1-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;

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        }
        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)

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    {

        //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)

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        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++;
            }
        }
    }
}

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```

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];

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        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];

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        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++];

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        //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[l1-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[l1-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[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_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[l1-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=11-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,total;

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

//if(strcmp(top,"acca")!=0&&strcmp(top,"accg")!=0&&strcmp(top,"acct")!=0&
&strcmp(top,"accc")!=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",sp1,sp2,sp3,sp4,p,st1,s
t2,bh1,bh2);

total=arma+armd+armac+armt;

fprintf(f1,"%d\t%d\t%d\t",total,bp_3,total_cons);

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","ggt","ctt","ttt"};

    int i,j,k,total;

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

```

```

//if(strcmp(top,"acca")!=0&&strcmp(top,"accg")!=0&&strcmp(top,"acct")!=0&
&strcmp(top,"accc")!=0)return 0;//tRNA gulo acca,or  tcca,or  ccca, or
gccca
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
",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)
{

```



```

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\ttotal_non_bonding\tbp3d\ttotal_cons\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+1;++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-1;--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+1+1-1,j=0;i<to&&j<20;++i)
            sp2[j++]=q[i];
        sp2[j]='\0';

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

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

if(n+1==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+1,total2+1,
total2+LENGTH-1,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+1+1-1,j=0;i<to&&j<20;++i)
            sp2[j++]=q[i];
        sp2[j]='\0';

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

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

        if(n+1==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+1,total2+1,
total2+LENGTH-1,p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2,top);
        }

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

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

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

        if (n+1==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+1,total2+1,
total2+LENGTH-1,p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2,top);
        }

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

```

```

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

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

        if (n+1==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+1, total2+1,
total2+LENGTH-1, p2, p4, p3, sp1, sp2, sp3, sp4, p, add, st1, st2, bh1, bh2, top);
            }
        }
    }

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+1;++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-1;--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+1,j=0;i<to&&j<20;++i)
    sp2[j++]=cq[i];
sp2[j]='\0';

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

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

if(n+1==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+1)+1,total-(n+1)+1,total-(total2+LENGTH-1)+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+1,j=0;i<to&&j<20;++i)
            sp2[j++]=cq[i];
        sp2[j]='\0';
```

```
        for(i=total2+LENGTH-1,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[--
```

```
jj]='\0';
```

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

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

```
    if(n+1==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+1)+1,total-(n+1)+1,total-(total2+LENGTH-1)+1,total-
(total2),p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2,top);
        }

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+1,j=0;i<to&&j<20;++i)
            sp2[j++]=cq[i];
        sp2[j]='\0';

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

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

        if (n+1==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+1)+1,total-(n+1)+1,total-(total2+LENGTH-1)+1,total-
(total2),p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2,top);
        }

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+1,j=0;i<to&&j<20;++i)
            sp2[j++]=cq[i];
        sp2[j]='\0';

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

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

```

```

if(n+1==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+1)+1,total-(n+1)+1,total-(total2+LENGTH-1)+1,total-
(total2),p2,p4,p3,sp1,sp2,sp3,sp4,p,add,st1,st2,bh1,bh2,top);
            }
        }
    }

//fclose(f4);
printf("Length=%d completed\n",LENGTH);
LENGTH++;
}

printf("Completed\n");getch();

}

```

