Priedai

B priedas. Skenavimo etapų programiniai kodai

B1. z=1 etapo skaičiavimo programinis kodas

```
clc
clear all

%%SKENAVIMO ETAPAS Z=1%%%

L=[4 3.5 3.5 4 3.5 3.5 4]; %elementu ilgiai, m

%MEDZIAGOS PARAMETRAI
E=205e6; %PLIENO tamprumo modulis
sigy=253.2e3; %PLIENO takumo riba
As=149e-4; %skerspjuvio plotas, m2
I=25.17e-5; % Inercijos momentas, m4
Wpl=1869e-6; %atsparumo momentas, m3
                         % As=0.785e-4; %Cir0.01 skerspjuviui pagal
STAAD
                         % I=4.9e-10;
EI=E*I
EA=E*As;
M0=sigy*Wpl;
N0=sigy*As;
xsi=1;
ck=M0/(xsi*N0); %ribiniu irazu santykis kolonoms, cia xsi -
klupumo koef.
cs=M0/N0; %ribiniu irazu santykis sijoms
```

```
A=zeros(17,21);
A(1,2)=1;
A(2,4)=1;
A(3,5)=1; A(3,7)=1;
A(4,8)=1; A(4,13)=1;
A(5,10)=1;
A(6,14)=1; A(6,16)=1;
A(7,17)=1; A(7,19)=1;
A(8,1)=-1/L(1); A(8,2)=-1/L(1); A(8,6)=-1;
A(9,3)=-1; A(9,4)=1/L(2); A(9,5)=1/L(2);
A(10,6)=1; A(10,9)=-1;
A(11,4)=-1/L(2); A(11,5)=-1/L(2); A(11,7)=1/L(3); A(11,8)=1/L(3);
A(12,9)=1; A(12,15)=-1; A(12,10)=-1/L(4); A(12,11)=-1/L(4);
A(13,7)=-1/L(3); A(13,8)=-1/L(3); A(13,13)=1/L(5);
A(13,14)=1/L(5); A(13,12)=-1;
A(14,15)=1; A(14,18)=-1;
A(15,13)=-1/L(5); A(15,14)=-1/L(5); A(15,16)=1/L(6);
A(15,17)=1/L(6);
A(16,18)=1; A(16,19)=-1/L(7); A(16,20)=-1/L(7);
A(17,16)=-1/L(6); A(17,17)=-1/L(6); A(17,21)=-1;



A;
Aeq= -A;

% Formuojama pasiduodamumo matrica D

d=@(LL,EI,EA) [LL/(3*EI) -LL/(6*EI) 0;...
    -LL/(6*EI) LL/(3*EI) 0;...
    0 0 LL/EA];

D=zeros(21,21); %( n x n )
D=blkdiag(d(L(1),EI,EA), d(L(2),EI,EA), d(L(3),EI,EA),
d(L(4),EI,EA), d(L(5),EI,EA), d(L(6),EI,EA), d(L(7),EI,EA));



% Skaiciuojame irazu influentine matrica:
alfa = inv(D)*A'*inv(A*inv(D)*A');
%poslinkiu influentine
beta=(A*(D^(-1))*A')^(-1);


%Apkrovu srities virsunes, z=1 etape
F01=341;
F02=0;
F1=[0 0 0 0 0 0 0 0 0 0 F01 0 0 0 0 0 0]';
F2=[0 0 0 0 0 0 0 0 0 0 0 0 0 0 F02 0 0]';
```

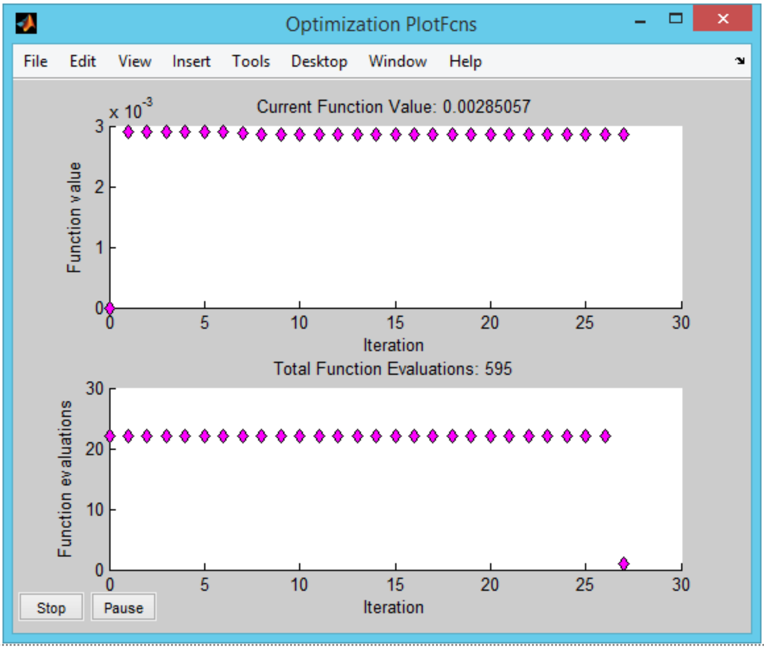
```
F3=[0 0 0 0 0 0 0 0 0 0 F01 0 0 0 F02 0 0]';

Se_F1=alfa*F1;
Se_F2=alfa*F2;
Se_F3=alfa*F3;



% Ivedame apribojimu, isreikstu nelygybemis, keficientu prie
nezinomuju
% matrica:
%Fi matricos sudarymas, realus skerspjuvis
Fi=zeros(84,21); % 14pj. x 6 takumo sal = 84, 7elementai x 3
irazos = 21
% 1 pjuvis
Fi(1:3,1:3)=[1 0 0;...
    1/1.18 0 ck;...
    1/1.18 0 -ck];
Fi(43:45,1:3)=[-1 0 0;...
    -1/1.18 0 ck;...
    -1/1.18 0 -ck];
% 2 pjuvis
Fi(4:6,1:3)=[0 1 0;...
    0 1/1.18 ck;...
    0 1/1.18 -ck];
Fi(46:48,1:3)=[0 -1 0;...
    0 -1/1.18 ck;...
    0 -1/1.18 -ck];
% 3 pjuvis
Fi(7:9,4:6)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(49:51,4:6)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 4 pjuvis
Fi(10:12,4:6)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(52:54,4:6)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 5 pjuvis
Fi(13:15,7:9)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(55:57,7:9)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 6 pjuvis
```

```
Fi(16:18,7:9)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(58:60,7:9)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 7 pjuvis
Fi(19:21,10:12)=[1 0 0;...
    1/1.18 0 ck;...
    1/1.18 0 -ck];
Fi(61:63,10:12)=[-1 0 0;...
    -1/1.18 0 ck;...
    -1/1.18 0 -ck];
% 8 pjuvis
Fi(22:24,10:12)=[0 1 0;...
    0 1/1.18 ck;...
    0 1/1.18 -ck];
Fi(64:66,10:12)=[0 -1 0;...
    0 -1/1.18 ck;...
    0 -1/1.18 -ck];
% 9 pjuvis
Fi(25:27,13:15)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(67:69,13:15)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 10 pjuvis
Fi(28:30,13:15)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(70:72,13:15)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 11 pjuvis
Fi(31:33,16:18)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(73:75,16:18)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 12 pjuvis
Fi(34:36,16:18)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(76:78,16:18)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 13 pjuvis
Fi(37:39,19:21)=[1 0 0;...
```

```
    1/1.18 0 ck;...
    1/1.18 0 -ck];
Fi(79:81,19:21)=[-1 0 0;...
    -1/1.18 0 ck;...
    -1/1.18 0 -ck];
% 14 pjuvis
Fi(40:42,19:21)=[0 1 0;...
    0 1/1.18 ck;...
    0 1/1.18 -ck];
Fi(82:84,19:21)=[0 -1 0;...
    0 -1/1.18 ck;...
    0 -1/1.18 -ck];

% Anq matricos visoms hodografo virsunems
Anq1=[Fi(1:42,1:21); Fi(43:84,1:21)];
Anq2=[Fi(1:42,1:21); Fi(43:84,1:21)];
Anq3=[Fi(1:42,1:21); Fi(43:84,1:21)];

Anq=[Anq1; Anq2; Anq3];

%Ankstesnio etapo (z-1) liekamosios irazos
Sr_previous=zeros(21,1);

global D Sr_previous;


bnq = [M0*ones(42,1)-Fi(1:42,1:21)*Se_F1-Fi(1:42,1:21)*Sr_previ-
ous; M0*ones(42,1)-Fi(43:84,1:21)*Se_F1-Fi(43:84,1:21)*Sr_previ-
ous;
    M0*ones(42,1)-Fi(1:42,1:21)*Se_F2-Fi(1:42,1:21)*Sr_previous;
M0*ones(42,1)-Fi(43:84,1:21)*Se_F2-Fi(43:84,1:21)*Sr_previous;
    M0*ones(42,1)-Fi(1:42,1:21)*Se_F3-Fi(1:42,1:21)*Sr_previous;
M0*ones(42,1)-Fi(43:84,1:21)*Se_F3-Fi(43:84,1:21)*Sr_previous];

x0=zeros(21,1);
lb=[];
ub=[];
beq=zeros(17,1);

nonlcon=[]; %nera netiesiniu lygybiu ir neligybiu apribojimu
options=optimset('Algorithm','sqp','TolCon',1e-12,'TolFun',1e-
12,'TolX',1e-12,'MaxFunEvals',1e6,'MaxIter',1e6,'PlotFcns',{@op-
timplotfval,@optimplotfunccount});
%'PlotFcns',{@optimplotfval,@optimplotfunccount,@optimplotx,@op-
timplotconstrviolation,@optimplotfirstorderopt,@optimplotstepsize}
[x,fval,exitflag,output,lambda]=fmincon(@my-
fun_scan_Premo,x0,Anq,bnq,Aeq,beq,lb,ub,nonlcon,options);

Sr = x(1:21);
```

```
% Msum = Mr_previous + Me_max + Me_min + Mr %+ Me_FC;
Sr_sum_nauji=Sr_previous+Sr;
% takumo_sal_tikrinimas=[Mr_previous+Me_FC+Me_max+Mr-M0; -Mr_pre-
vious-Me_FC-Me_min-Mr-M0];
tak_sal_tik1=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F1-(M0*ones(84,1))];
tak_sal_tik2=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F2-(M0*ones(84,1))];
tak_sal_tik3=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F3-(M0*ones(84,1))];

tak_sal_tik=[tak_sal_tik1 tak_sal_tik2 tak_sal_tik3];


for i=1:3; k=1:14; kt=i:3:42; kn=i+42:3:84;
 % 1-ai virsunei
   tst1(i,k)=tak_sal_tik1(kt); %teigiamos takumo salygu reiksmes
   tst2(i,k)=tak_sal_tik1(kn); %neigiamos takumo salygu reiksmes
 % 2-ai virsunei
   tst3(i,k)=tak_sal_tik2(kt);
   tst4(i,k)=tak_sal_tik2(kn);
 % 3-iai virsunei
   tst5(i,k)=tak_sal_tik3(kt);
   tst6(i,k)=tak_sal_tik3(kn);
end;

tst=[tst1;tst2;tst3;tst4;tst5;tst6];


% % Kinematines formuluotes rezultatai:
ur = lambda.eqlin;
plast_daug = lambda.ineqlin
Fi=[Fi(1:84,1:21);Fi(1:84,1:21);Fi(1:84,1:21)];
teta_p = Fi'*lambda.ineqlin
% ue=(A*inv(D)*A')^(-1);
% usum=ue+ur;


for i=1:3; k=1:14; kt=i:3:42; kn=i+42:3:84;
 % 1-ai virsunei
   pld1(i,k)=plast_daug(kt); %teigiamos takumo salygu reiksmes
   pld2(i,k)=plast_daug(kn); %neigiamos takumo salygu reiksmes
end;

for i=1:3; k=1:14; kt=i+84:3:126; kn=i+126:3:168;
 % 2-ai virsunei
   pld3(i,k)=plast_daug(kt);
   pld4(i,k)=plast_daug(kn);
end;
```

```
for i=1:3; k=1:14; kt=i+168:3:210; kn=i+210:3:252;
    % 3-iai virsunei
   pld5(i,k)=plast_daug(kt);
   pld6(i,k)=plast_daug(kn);
end;

pld=[pld1;pld2;pld3;pld4;pld5;pld6];

%influentines liekamuju dydziu matricos
G=((D^(-1))*A'*(A*(D^(-1))*A')^(-1))*A*(D^(-1))-(D^(-1));
H=((A*(D^(-1))*A')^(-1))*A*(D^(-1));

%patikirnimas per influentines liekamuju dydziu matricas ir plas-
tines
%deformacijas
% Mr_per_G=G*teta_p;
% ur_per_H=H*teta_p;

%PIRMO ETAPO (z=1) REZULTATU SPAUSDINIMAS EXCEL FORMATU
%     xlswrite('P2remo_an-
alize_I.xlsx',[Se_F1';Se_F2';Se_F3';Sr'],'S');
%     xlswrite('P2remo_analize_I.xlsx',[tst;pld],'tak_sal ir
pld');
%     xlswrite('P2remo_analize_I.xlsx',teta_p','teta_pl');



% lambda.ineqlin
% takums=[Me_max+Mr -Me_min-Mr]
teta_p
exitflag %isprendimo pozymis
```



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B2. z=2 etapo skaičiavimo programinis kodas

```
clc
clear all

%%SKENAVIMO ETAPAS Z=2%%%

L=[4 3.5 3.5 4 3.5 3.5 4]; %elementu ilgiai, m
%MEDZIAGOS PARAMETRAI
E=205e6; %PLIENO tamprumo modulis
sigy=253.2e3; %PLIENO takumo riba
As=149e-4; %skerspjuvio plotas, m2
I=25.17e-5; % Inercijos momentas, m4
Wpl=1869e-6; %atsparumo momentas, m3
                        % As=0.785e-4; %Cir0.01 skerspjuviui pagal
STAAD
                        % I=4.9e-10;

EI=E*I
EA=E*As;
```

```
M0=sigy*Wpl;
N0=sigy*As;
xsi=1;
ck=M0/(xsi*N0); %ribiniu irazu santykis kolonoms, cia xsi -
klupumo koef.
cs=M0/N0; %ribiniu irazu santykis sijoms

A=zeros(17,21);
A(1,2)=1;
A(2,4)=1;
A(3,5)=1; A(3,7)=1;
A(4,8)=1; A(4,13)=1;
A(5,10)=1;
A(6,14)=1; A(6,16)=1;
A(7,17)=1; A(7,19)=1;
A(8,1)=-1/L(1); A(8,2)=-1/L(1); A(8,6)=-1;
A(9,3)=-1; A(9,4)=1/L(2); A(9,5)=1/L(2);
A(10,6)=1; A(10,9)=-1;
A(11,4)=-1/L(2); A(11,5)=-1/L(2); A(11,7)=1/L(3); A(11,8)=1/L(3);
A(12,9)=1; A(12,15)=-1; A(12,10)=-1/L(4); A(12,11)=-1/L(4);
A(13,7)=-1/L(3); A(13,8)=-1/L(3); A(13,13)=1/L(5);
A(13,14)=1/L(5); A(13,12)=-1;
A(14,15)=1; A(14,18)=-1;
A(15,13)=-1/L(5); A(15,14)=-1/L(5); A(15,16)=1/L(6);
A(15,17)=1/L(6);
A(16,18)=1; A(16,19)=-1/L(7); A(16,20)=-1/L(7);
A(17,16)=-1/L(6); A(17,17)=-1/L(6); A(17,21)=-1;



A;
Aeq= -A;

% Formuojama pasiduodamumo matrica D

d=@(LL,EI,EA) [LL/(3*EI) -LL/(6*EI) 0;...
    -LL/(6*EI) LL/(3*EI) 0;...
    0 0 LL/EA];

D=zeros(21,21); %( n x n )
D=blkdiag(d(L(1),EI,EA), d(L(2),EI,EA), d(L(3),EI,EA),
d(L(4),EI,EA), d(L(5),EI,EA), d(L(6),EI,EA), d(L(7),EI,EA));



% Skaiciuojame irazu influentine matrica:
alfa = inv(D)*A'*inv(A*inv(D)*A');
%poslinkiu influentine
beta=(A*(D^(-1))*A')^(-1);
```

```
%Apkrovu srities virsunes, z=2 etape
F0=1;
F01=341;
F02=398.3159;
F1=[0 0 0 0 0 0 0 0 0 0 F01 0 0 0 0 0 0]';
F2=[0 0 0 0 0 0 0 0 0 0 0 0 0 0 F02 0 0]';
F3=[0 0 0 0 0 0 0 0 0 0 F01 0 0 0 F02 0 0]';

Se_F1=alfa*F1;
Se_F2=alfa*F2;
Se_F3=alfa*F3;



% Ivedame apribojimu, isreikstu nelygybemis, keficientu prie
nezinomuju
% matrica:
%Fi matricos sudarymas, realus skerspjuvis
Fi=zeros(84,21); % 14pj. x 6 takumo sal = 84, 7elementai x 3
irazos = 21
% 1 pjuvis
Fi(1:3,1:3)=[1 0 0;...
    1/1.18 0 ck;...
    1/1.18 0 -ck];
Fi(43:45,1:3)=[-1 0 0;...
    -1/1.18 0 ck;...
    -1/1.18 0 -ck];
% 2 pjuvis
Fi(4:6,1:3)=[0 1 0;...
    0 1/1.18 ck;...
    0 1/1.18 -ck];
Fi(46:48,1:3)=[0 -1 0;...
    0 -1/1.18 ck;...
    0 -1/1.18 -ck];
% 3 pjuvis
Fi(7:9,4:6)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(49:51,4:6)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 4 pjuvis
Fi(10:12,4:6)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(52:54,4:6)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
```

```
% 5 pjuvis
Fi(13:15,7:9)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(55:57,7:9)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 6 pjuvis
Fi(16:18,7:9)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(58:60,7:9)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 7 pjuvis
Fi(19:21,10:12)=[1 0 0;...
    1/1.18 0 ck;...
    1/1.18 0 -ck];
Fi(61:63,10:12)=[-1 0 0;...
    -1/1.18 0 ck;...
    -1/1.18 0 -ck];
% 8 pjuvis
Fi(22:24,10:12)=[0 1 0;...
    0 1/1.18 ck;...
    0 1/1.18 -ck];
Fi(64:66,10:12)=[0 -1 0;...
    0 -1/1.18 ck;...
    0 -1/1.18 -ck];
% 9 pjuvis
Fi(25:27,13:15)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(67:69,13:15)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 10 pjuvis
Fi(28:30,13:15)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(70:72,13:15)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 11 pjuvis
Fi(31:33,16:18)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(73:75,16:18)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 12 pjuvis
```

```
Fi(34:36,16:18)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(76:78,16:18)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 13 pjuvis
Fi(37:39,19:21)=[1 0 0;...
    1/1.18 0 ck;...
    1/1.18 0 -ck];
Fi(79:81,19:21)=[-1 0 0;...
    -1/1.18 0 ck;...
    -1/1.18 0 -ck];
% 14 pjuvis
Fi(40:42,19:21)=[0 1 0;...
    0 1/1.18 ck;...
    0 1/1.18 -ck];
Fi(82:84,19:21)=[0 -1 0;...
    0 -1/1.18 ck;...
    0 -1/1.18 -ck];

% Anq matricos visoms hodografo virsunems
Anq1=[Fi(1:42,1:21); Fi(43:84,1:21)];
Anq2=[Fi(1:42,1:21); Fi(43:84,1:21)];
Anq3=[Fi(1:42,1:21); Fi(43:84,1:21)];

Anq=[Anq1; Anq2; Anq3];

%Ankstesnio etapo (z-1) liekamosios irazos
Sr_previous=[-1.09022286068708;-2.85254392927603e-
33;1.17290642402915;2.85254392927603e-
33;4.10517248410201;0.272555715171770;-
4.10517248410201;8.21034496820403;0.272555715171770;0;-
1.09626491547762;-2.65961028470258;-
8.21034496820403;3.00688145584700;0.546621944041176;-
3.00688145584700;-
2.19658205651003;0.546621944041176;2.19658205651003;-
0.0100942803453321;1.48670386067344;];

global D Sr_previous;


bnq = [M0*ones(42,1)-Fi(1:42,1:21)*Se_F1-Fi(1:42,1:21)*Sr_previ-
ous; M0*ones(42,1)-Fi(43:84,1:21)*Se_F1-Fi(43:84,1:21)*Sr_previ-
ous;
    M0*ones(42,1)-Fi(1:42,1:21)*Se_F2-Fi(1:42,1:21)*Sr_previous;
M0*ones(42,1)-Fi(43:84,1:21)*Se_F2-Fi(43:84,1:21)*Sr_previous;
    M0*ones(42,1)-Fi(1:42,1:21)*Se_F3-Fi(1:42,1:21)*Sr_previous;
M0*ones(42,1)-Fi(43:84,1:21)*Se_F3-Fi(43:84,1:21)*Sr_previous];
```

```
x0=zeros(21,1);
lb=[];
ub=[];
beq=zeros(17,1);

nonlcon=[]; %nera netiesiniu lygybiu ir neligybiu apribojimu
options=optimset('Algorithm','sqp','TolCon',1e-12,'TolFun',1e-
12,'TolX',1e-12,'MaxFunEvals',1e6,'MaxIter',1e6,'PlotFcns',{@op-
timplotfval,@optimplotfunccount});
%'PlotFcns',{@optimplotfval,@optimplotfunccount,@optimplotx,@op-
timplotconstrviolation,@optimplotfirstorderopt,@optimplotstepsize}
[x,fval,exitflag,output,lambda]=fmincon(@my-
fun_scan_Premo,x0,Anq,bnq,Aeq,beq,lb,ub,nonlcon,options);

Sr = x(1:21);

% Msum = Mr_previous + Me_max + Me_min + Mr %+ Me_FC;
Sr_sum_nauji=Sr_previous+Sr;
% takumo_sal_tikrinimas=[Mr_previous+Me_FC+Me_max+Mr-M0; -Mr_pre-
vious-Me_FC-Me_min-Mr-M0];
tak_sal_tik1=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F1-(M0*ones(84,1))];
tak_sal_tik2=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F2-(M0*ones(84,1))];
tak_sal_tik3=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F3-(M0*ones(84,1))];

tak_sal_tik=[tak_sal_tik1 tak_sal_tik2 tak_sal_tik3];


for i=1:3; k=1:14; kt=i:3:42; kn=i+42:3:84;
 % 1-ai virsunei
   tst1(i,k)=tak_sal_tik1(kt); %teigiamos takumo salygu reiksmes
   tst2(i,k)=tak_sal_tik1(kn); %neigiamos takumo salygu reiksmes
 % 2-ai virsunei
   tst3(i,k)=tak_sal_tik2(kt);
   tst4(i,k)=tak_sal_tik2(kn);
 % 3-iai virsunei
   tst5(i,k)=tak_sal_tik3(kt);
   tst6(i,k)=tak_sal_tik3(kn);
end;

tst=[tst1;tst2;tst3;tst4;tst5;tst6];


% % Kinematines formuluotes rezultatai:
ur = lambda.eqlin;
plast_daug = lambda.ineqlin
Fi=[Fi(1:84,1:21);Fi(1:84,1:21);Fi(1:84,1:21)];
teta_p = Fi'*lambda.ineqlin
```

```
% ue=(A*inv(D)*A')^(-1);
% usum=ue+ur;


for i=1:3; k=1:14; kt=i:3:42; kn=i+42:3:84;
 % 1-ai virsunei
   pld1(i,k)=plast_daug(kt); %teigiamos takumo salygu reiksmes
   pld2(i,k)=plast_daug(kn); %neigiamos takumo salygu reiksmes
end;

for i=1:3; k=1:14; kt=i+84:3:126; kn=i+126:3:168;
 % 2-ai virsunei
   pld3(i,k)=plast_daug(kt);
   pld4(i,k)=plast_daug(kn);
end;

for i=1:3; k=1:14; kt=i+168:3:210; kn=i+210:3:252;
    % 3-iai virsunei
   pld5(i,k)=plast_daug(kt);
   pld6(i,k)=plast_daug(kn);
end;

pld=[pld1;pld2;pld3;pld4;pld5;pld6];

%influentines liekamuju dydziu matricos
G=((D^(-1))*A'*(A*(D^(-1))*A')^(-1))*A*(D^(-1))-(D^(-1));
H=((A*(D^(-1))*A')^(-1))*A*(D^(-1));

%patikirnimas per influentines liekamuju dydziu matricas ir plas-
tines
%deformacijas
% Mr_per_G=G*teta_p;
% ur_per_H=H*teta_p;

%ANTRO ETAPO (z=2) REZULTATU SPAUSDINIMAS EXCEL FORMATU
%     xlswrite('P2remo_an-
alize_II.xlsx',[Se_F1';Se_F2';Se_F3';Sr'],'S');
%     xlswrite('P2remo_analize_II.xlsx',[tst;pld],'tak_sal ir
pld');
%     xlswrite('P2remo_analize_II.xlsx',teta_p','teta_pl');


% lambda.ineqlin
% takums=[Me_max+Mr -Me_min-Mr]
teta_p
exitflag %isprendimo pozymis
```

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B3. z=3 etapo skaičiavimo programinis kodas

```
clc
clear all

%%SKENAVIMO ETAPAS Z=3%%%
L=[4 3.5 3.5 4 3.5 3.5 4]; %elementu ilgiai, m

%MEDZIAGOS PARAMETRAI
E=205e6; %PLIENO tamprumo modulis
sigy=253.2e3; %PLIENO takumo riba
As=149e-4; %skerspjuvio plotas, m2
I=25.17e-5; % Inercijos momentas, m4
Wpl=1869e-6; %atsparumo momentas, m3

EI=E*I
EA=E*As;
M0=sigy*Wpl;
N0=sigy*As;
xsi=1;
ck=M0/(xsi*N0); %ribiniu irazu santykis kolonoms, cia xsi -
klupumo koef.
cs=M0/N0; %ribiniu irazu santykis sijoms

A=zeros(17,21);
A(1,2)=1;
A(2,4)=1;
A(3,5)=1; A(3,7)=1;
A(4,8)=1; A(4,13)=1;
A(5,10)=1;
A(6,14)=1; A(6,16)=1;
A(7,17)=1; A(7,19)=1;
A(8,1)=-1/L(1); A(8,2)=-1/L(1); A(8,6)=-1;
A(9,3)=-1; A(9,4)=1/L(2); A(9,5)=1/L(2);
A(10,6)=1; A(10,9)=-1;
A(11,4)=-1/L(2); A(11,5)=-1/L(2); A(11,7)=1/L(3); A(11,8)=1/L(3);
A(12,9)=1; A(12,15)=-1; A(12,10)=-1/L(4); A(12,11)=-1/L(4);
A(13,7)=-1/L(3); A(13,8)=-1/L(3); A(13,13)=1/L(5);
A(13,14)=1/L(5); A(13,12)=-1;
A(14,15)=1; A(14,18)=-1;
A(15,13)=-1/L(5); A(15,14)=-1/L(5); A(15,16)=1/L(6);
A(15,17)=1/L(6);
A(16,18)=1; A(16,19)=-1/L(7); A(16,20)=-1/L(7);
A(17,16)=-1/L(6); A(17,17)=-1/L(6); A(17,21)=-1;



A;
Aeq= -A;
```

```
% Formuojama pasiduodamumo matrica D

d=@(LL,EI,EA) [LL/(3*EI) -LL/(6*EI) 0;...
    -LL/(6*EI) LL/(3*EI) 0;...
    0 0 LL/EA];

D=zeros(21,21); %( n x n )
D=blkdiag(d(L(1),EI,EA), d(L(2),EI,EA), d(L(3),EI,EA),
d(L(4),EI,EA), d(L(5),EI,EA), d(L(6),EI,EA), d(L(7),EI,EA));



% Skaiciuojame irazu influentine matrica:
alfa = inv(D)*A'*inv(A*inv(D)*A');
%poslinkiu influentine
beta=(A*(D^(-1))*A')^(-1);



%Apkrovu srities virsunes, z=3 etape
F0=1;
F01=341;
F02=411.4771;
F1=[0 0 0 0 0 0 0 0 0 0 F01 0 0 0 0 0 0]';
F2=[0 0 0 0 0 0 0 0 0 0 0 0 0 0 F02 0 0]';
F3=[0 0 0 0 0 0 0 0 0 0 F01 0 0 0 F02 0 0]';

Se_F1=alfa*F1;
Se_F2=alfa*F2;
Se_F3=alfa*F3;



% Ivedame apribojimu, isreikstu nelygybemis, keficientu prie
nezinomuju
% matrica:
%Fi matricos sudarymas, realus skerspjuvis
Fi=zeros(84,21); % 14pj. x 6 takumo sal = 84, 7elementai x 3
irazos = 21
% 1 pjuvis
Fi(1:3,1:3)=[1 0 0;...
    1/1.18 0 ck;...
    1/1.18 0 -ck];
Fi(43:45,1:3)=[-1 0 0;...
    -1/1.18 0 ck;...
    -1/1.18 0 -ck];
% 2 pjuvis
Fi(4:6,1:3)=[0 1 0;...
    0 1/1.18 ck;...
```

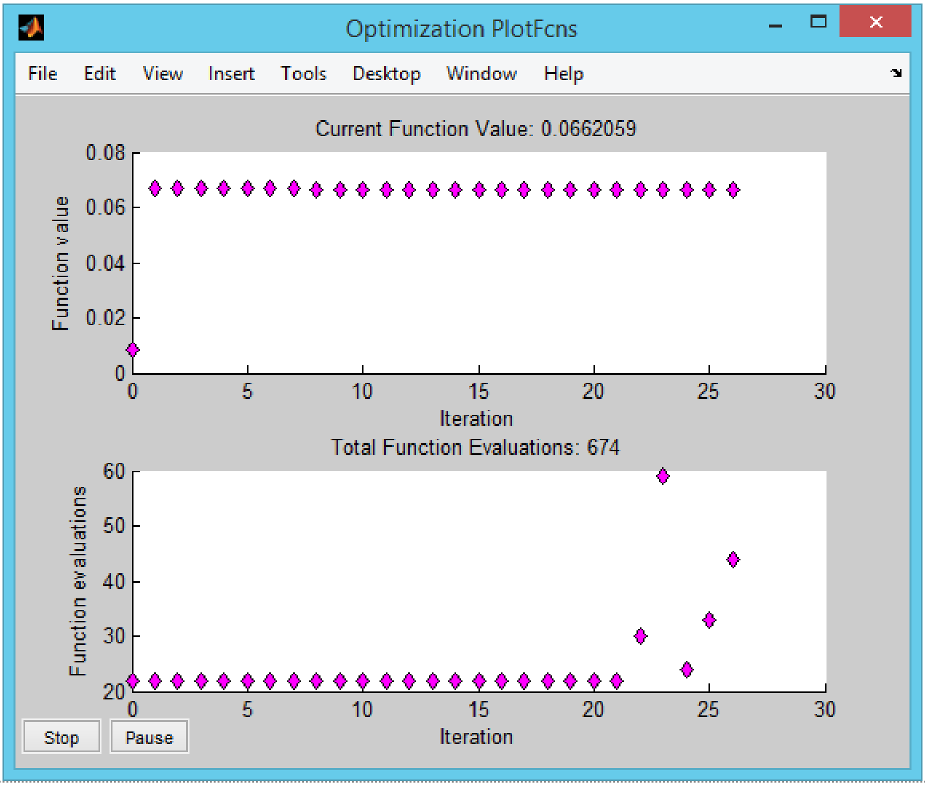
```
     0 1/1.18 -ck];
Fi(46:48,1:3)=[0 -1 0;...
     0 -1/1.18 ck;...
     0 -1/1.18 -ck];
% 3 pjuvis
Fi(7:9,4:6)=[1 0 0;...
     1/1.18 0 cs;...
     1/1.18 0 -cs];
Fi(49:51,4:6)=[-1 0 0;...
     -1/1.18 0 cs;...
     -1/1.18 0 -cs];
% 4 pjuvis
Fi(10:12,4:6)=[0 1 0;...
     0 1/1.18 cs;...
     0 1/1.18 -cs];
Fi(52:54,4:6)=[0 -1 0;...
     0 -1/1.18 cs;...
     0 -1/1.18 -cs];
% 5 pjuvis
Fi(13:15,7:9)=[1 0 0;...
     1/1.18 0 cs;...
     1/1.18 0 -cs];
Fi(55:57,7:9)=[-1 0 0;...
     -1/1.18 0 cs;...
     -1/1.18 0 -cs];
% 6 pjuvis
Fi(16:18,7:9)=[0 1 0;...
     0 1/1.18 cs;...
     0 1/1.18 -cs];
Fi(58:60,7:9)=[0 -1 0;...
     0 -1/1.18 cs;...
     0 -1/1.18 -cs];
% 7 pjuvis
Fi(19:21,10:12)=[1 0 0;...
     1/1.18 0 ck;...
     1/1.18 0 -ck];
Fi(61:63,10:12)=[-1 0 0;...
     -1/1.18 0 ck;...
     -1/1.18 0 -ck];
% 8 pjuvis
Fi(22:24,10:12)=[0 1 0;...
     0 1/1.18 ck;...
     0 1/1.18 -ck];
Fi(64:66,10:12)=[0 -1 0;...
     0 -1/1.18 ck;...
     0 -1/1.18 -ck];
% 9 pjuvis
Fi(25:27,13:15)=[1 0 0;...
     1/1.18 0 cs;...
     1/1.18 0 -cs];
```

```
Fi(67:69,13:15)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 10 pjuvis
Fi(28:30,13:15)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(70:72,13:15)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 11 pjuvis
Fi(31:33,16:18)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(73:75,16:18)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 12 pjuvis
Fi(34:36,16:18)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(76:78,16:18)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 13 pjuvis
Fi(37:39,19:21)=[1 0 0;...
    1/1.18 0 ck;...
    1/1.18 0 -ck];
Fi(79:81,19:21)=[-1 0 0;...
    -1/1.18 0 ck;...
    -1/1.18 0 -ck];
% 14 pjuvis
Fi(40:42,19:21)=[0 1 0;...
    0 1/1.18 ck;...
    0 1/1.18 -ck];
Fi(82:84,19:21)=[0 -1 0;...
    0 -1/1.18 ck;...
    0 -1/1.18 -ck];

% Anq matricos visoms hodografo virsunems
Anq1=[Fi(1:42,1:21); Fi(43:84,1:21)];
Anq2=[Fi(1:42,1:21); Fi(43:84,1:21)];
Anq3=[Fi(1:42,1:21); Fi(43:84,1:21)];

Anq=[Anq1; Anq2; Anq3];

%Ankstesnio etapo (z-1) liekamosios irazos
Sr_previous=[4.49715105918348;7.16463471217600e-
34;1.17292206960096;2.72398208499148e-33;4.10522724360333;-
1.12428776479587;-4.10522724360333;8.21045448720667;-
```

```
1.12428776479587;2.80284822949281e-32;4.52207930393951;-
1.05143435653037;-8.21045448720667;8.63566148295371;-
2.25480759078075;-8.63566148295371;9.06086847870075;-
2.25480759078075;-9.06086847870075;0.0416381155777521;-
0.121487713070580;];

global D Sr_previous;


bnq = [M0*ones(42,1)-Fi(1:42,1:21)*Se_F1-Fi(1:42,1:21)*Sr_previ-
ous; M0*ones(42,1)-Fi(43:84,1:21)*Se_F1-Fi(43:84,1:21)*Sr_previ-
ous;
    M0*ones(42,1)-Fi(1:42,1:21)*Se_F2-Fi(1:42,1:21)*Sr_previous;
M0*ones(42,1)-Fi(43:84,1:21)*Se_F2-Fi(43:84,1:21)*Sr_previous;
    M0*ones(42,1)-Fi(1:42,1:21)*Se_F3-Fi(1:42,1:21)*Sr_previous;
M0*ones(42,1)-Fi(43:84,1:21)*Se_F3-Fi(43:84,1:21)*Sr_previous];

x0=zeros(21,1);
lb=[];
ub=[];
beq=zeros(17,1);

nonlcon=[]; %nera netiesiniu lygybiu ir neligybiu apribojimu
options=optimset('Algorithm','sqp','TolCon',1e-12,'TolFun',1e-
12,'TolX',1e-12,'MaxFunEvals',1e6,'MaxIter',1e6,'PlotFcns',{@op-
timplotfval,@optimplotfunccount});
%'PlotFcns',{@optimplotfval,@optimplotfunccount,@optimplotx,@op-
timplotconstrviolation,@optimplotfirstorderopt,@optimplotstepsize}
[x,fval,exitflag,output,lambda]=fmincon(@my-
fun_scan_Premo,x0,Anq,bnq,Aeq,beq,lb,ub,nonlcon,options);

Sr = x(1:21);

% Msum = Mr_previous + Me_max + Me_min + Mr %+ Me_FC;
Sr_sum_nauji=Sr_previous+Sr;
% takumo_sal_tikrinimas=[Mr_previous+Me_FC+Me_max+Mr-M0; -Mr_pre-
vious-Me_FC-Me_min-Mr-M0];
tak_sal_tik1=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F1-(M0*ones(84,1))];
tak_sal_tik2=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F2-(M0*ones(84,1))];
tak_sal_tik3=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F3-(M0*ones(84,1))];

tak_sal_tik=[tak_sal_tik1 tak_sal_tik2 tak_sal_tik3];


for i=1:3; k=1:14; kt=i:3:42; kn=i+42:3:84;
 % 1-ai virsunei
   tst1(i,k)=tak_sal_tik1(kt); %teigiamos takumo salygu reiksmes
   tst2(i,k)=tak_sal_tik1(kn); %neigiamos takumo salygu reiksmes
```

```
 % 2-ai virsunei
   tst3(i,k)=tak_sal_tik2(kt);
   tst4(i,k)=tak_sal_tik2(kn);
 % 3-iai virsunei
   tst5(i,k)=tak_sal_tik3(kt);
   tst6(i,k)=tak_sal_tik3(kn);
end;

tst=[tst1;tst2;tst3;tst4;tst5;tst6];


% % Kinematines formuluotes rezultatai:
ur = lambda.eqlin;
plast_daug = lambda.ineqlin
Fi=[Fi(1:84,1:21);Fi(1:84,1:21);Fi(1:84,1:21)];
teta_p = Fi'*lambda.ineqlin
% ue=(A*inv(D)*A')^(-1);
% usum=ue+ur;


for i=1:3; k=1:14; kt=i:3:42; kn=i+42:3:84;
 % 1-ai virsunei
   pld1(i,k)=plast_daug(kt); %teigiamos takumo salygu reiksmes
   pld2(i,k)=plast_daug(kn); %neigiamos takumo salygu reiksmes
end;

for i=1:3; k=1:14; kt=i+84:3:126; kn=i+126:3:168;
 % 2-ai virsunei
   pld3(i,k)=plast_daug(kt);
   pld4(i,k)=plast_daug(kn);
end;

for i=1:3; k=1:14; kt=i+168:3:210; kn=i+210:3:252;
    % 3-iai virsunei
   pld5(i,k)=plast_daug(kt);
   pld6(i,k)=plast_daug(kn);
end;

pld=[pld1;pld2;pld3;pld4;pld5;pld6];

%influentines liekamuju dydziu matricos
G=((D^(-1))*A'*(A*(D^(-1))*A')^(-1))*A*(D^(-1))-(D^(-1));
H=((A*(D^(-1))*A')^(-1))*A*(D^(-1));

%patikirnimas per influentines liekamuju dydziu matricas ir plas-
tines
%deformacijas
% Mr_per_G=G*teta_p;
% ur_per_H=H*teta_p;
```

```
%TRECIO ETAPO (z=3) REZULTATU SPAUSDINIMAS EXCEL FORMATU
%
xlswrite('P2remo_analize_Srsum_plius_dSr_III.xlsx',[Sr_previous';S
e_F1';Se_F2';Se_F3';Sr'],'S');
%
xlswrite('P2remo_analize_Srsum_plius_dSr_III.xlsx',[tst;pld],'tak_
sal ir pld');
%
xlswrite('P2remo_analize_Srsum_plius_dSr_III.xlsx',teta_p','teta_p
l');



% lambda.ineqlin
% takums=[Me_max+Mr -Me_min-Mr]
teta_p
exitflag %issprendimo pozymis
```



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B4. z=4 etapo skaičiavimo programinis kodas

```
clc
clear all

%%SKENAVIMO ETAPAS Z=4%%%

L=[4 3.5 3.5 4 3.5 3.5 4]; %elementu ilgiai, m
%MEDZIAGOS PARAMETRAI
E=205e6; %PLIENO tamprumo modulis
sigy=253.2e3; %PLIENO takumo riba
As=149e-4; %skerspjuvio plotas, m2
I=25.17e-5; % Inercijos momentas, m4
Wpl=1869e-6; %atsparumo momentas, m3

EI=E*I
EA=E*As;
M0=sigy*Wpl;
N0=sigy*As;
xsi=1;
ck=M0/(xsi*N0); %ribiniu irazu santykis kolonoms, cia xsi -
klupumo koef.
cs=M0/N0; %ribiniu irazu santykis sijoms

A=zeros(17,21);
A(1,2)=1;
A(2,4)=1;
A(3,5)=1; A(3,7)=1;
A(4,8)=1; A(4,13)=1;
A(5,10)=1;
A(6,14)=1; A(6,16)=1;
A(7,17)=1; A(7,19)=1;
A(8,1)=-1/L(1); A(8,2)=-1/L(1); A(8,6)=-1;
A(9,3)=-1; A(9,4)=1/L(2); A(9,5)=1/L(2);
A(10,6)=1; A(10,9)=-1;
A(11,4)=-1/L(2); A(11,5)=-1/L(2); A(11,7)=1/L(3); A(11,8)=1/L(3);
A(12,9)=1; A(12,15)=-1; A(12,10)=-1/L(4); A(12,11)=-1/L(4);
A(13,7)=-1/L(3); A(13,8)=-1/L(3); A(13,13)=1/L(5);
A(13,14)=1/L(5); A(13,12)=-1;
A(14,15)=1; A(14,18)=-1;
A(15,13)=-1/L(5); A(15,14)=-1/L(5); A(15,16)=1/L(6);
A(15,17)=1/L(6);
A(16,18)=1; A(16,19)=-1/L(7); A(16,20)=-1/L(7);
A(17,16)=-1/L(6); A(17,17)=-1/L(6); A(17,21)=-1;



A;
Aeq= -A;
```

```
% Formuojama pasiduodamumo matrica D

d=@(LL,EI,EA) [LL/(3*EI) -LL/(6*EI) 0;...
    -LL/(6*EI) LL/(3*EI) 0;...
    0 0 LL/EA];

D=zeros(21,21); %( n x n )
D=blkdiag(d(L(1),EI,EA), d(L(2),EI,EA), d(L(3),EI,EA),
d(L(4),EI,EA), d(L(5),EI,EA), d(L(6),EI,EA), d(L(7),EI,EA));



% Skaiciuojame irazu influentine matrica:
alfa = inv(D)*A'*inv(A*inv(D)*A');
%poslinkiu influentine
beta=(A*(D^(-1))*A')^(-1);



%Apkrovu srities virsunes, z=4 etape
F01=341;
F02=440;
F1=[0 0 0 0 0 0 0 0 0 0 F01 0 0 0 0 0 0]';
F2=[0 0 0 0 0 0 0 0 0 0 0 0 0 0 F02 0 0]';
F3=[0 0 0 0 0 0 0 0 0 0 F01 0 0 0 F02 0 0]';

Se_F1=alfa*F1;
Se_F2=alfa*F2;
Se_F3=alfa*F3;



% Ivedame apribojimu, isreikstu nelygybemis, keficientu prie
nezinomuju
% matrica:
%Fi matricos sudarymas, realus skerspjuvis
Fi=zeros(84,21); % 14pj. x 6 takumo sal = 84, 7elementai x 3
irazos = 21
% 1 pjuvis
Fi(1:3,1:3)=[1 0 0;...
    1/1.18 0 ck;...
    1/1.18 0 -ck];
Fi(43:45,1:3)=[-1 0 0;...
    -1/1.18 0 ck;...
    -1/1.18 0 -ck];
% 2 pjuvis
Fi(4:6,1:3)=[0 1 0;...
    0 1/1.18 ck;...
    0 1/1.18 -ck];
```

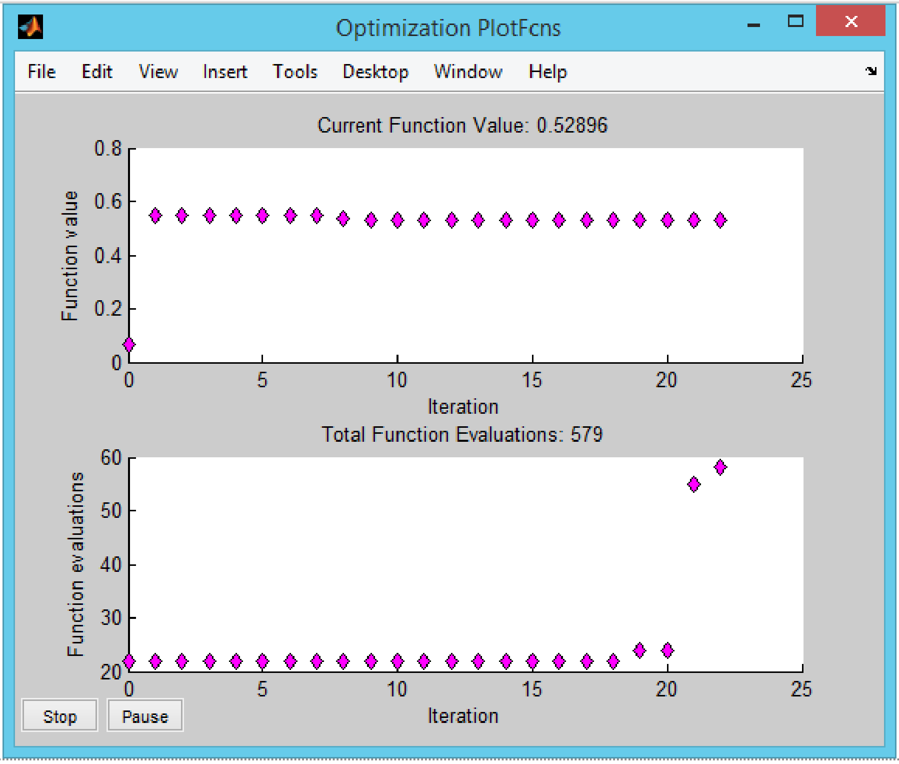
```
Fi(46:48,1:3)=[0 -1 0;...
    0 -1/1.18 ck;...
    0 -1/1.18 -ck];
% 3 pjuvis
Fi(7:9,4:6)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(49:51,4:6)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 4 pjuvis
Fi(10:12,4:6)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(52:54,4:6)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 5 pjuvis
Fi(13:15,7:9)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(55:57,7:9)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 6 pjuvis
Fi(16:18,7:9)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(58:60,7:9)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 7 pjuvis
Fi(19:21,10:12)=[1 0 0;...
    1/1.18 0 ck;...
    1/1.18 0 -ck];
Fi(61:63,10:12)=[-1 0 0;...
    -1/1.18 0 ck;...
    -1/1.18 0 -ck];
% 8 pjuvis
Fi(22:24,10:12)=[0 1 0;...
    0 1/1.18 ck;...
    0 1/1.18 -ck];
Fi(64:66,10:12)=[0 -1 0;...
    0 -1/1.18 ck;...
    0 -1/1.18 -ck];
% 9 pjuvis
Fi(25:27,13:15)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(67:69,13:15)=[-1 0 0;...
```

```
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 10 pjuvis
Fi(28:30,13:15)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(70:72,13:15)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 11 pjuvis
Fi(31:33,16:18)=[1 0 0;...
    1/1.18 0 cs;...
    1/1.18 0 -cs];
Fi(73:75,16:18)=[-1 0 0;...
    -1/1.18 0 cs;...
    -1/1.18 0 -cs];
% 12 pjuvis
Fi(34:36,16:18)=[0 1 0;...
    0 1/1.18 cs;...
    0 1/1.18 -cs];
Fi(76:78,16:18)=[0 -1 0;...
    0 -1/1.18 cs;...
    0 -1/1.18 -cs];
% 13 pjuvis
Fi(37:39,19:21)=[1 0 0;...
    1/1.18 0 ck;...
    1/1.18 0 -ck];
Fi(79:81,19:21)=[-1 0 0;...
    -1/1.18 0 ck;...
    -1/1.18 0 -ck];
% 14 pjuvis
Fi(40:42,19:21)=[0 1 0;...
    0 1/1.18 ck;...
    0 1/1.18 -ck];
Fi(82:84,19:21)=[0 -1 0;...
    0 -1/1.18 ck;...
    0 -1/1.18 -ck];

% Anq matricos visoms hodografo virsunems
Anq1=[Fi(1:42,1:21); Fi(43:84,1:21)];
Anq2=[Fi(1:42,1:21); Fi(43:84,1:21)];
Anq3=[Fi(1:42,1:21); Fi(43:84,1:21)];

Anq=[Anq1; Anq2; Anq3];

%Ankstesnio etapo (z-1) liekamosios irazos
Sr_previous=[12.7887513832770;-1.13062570211351e-
34;3.33547293979456;3.57043722930674e-33;11.6741552892809;-
3.19718784581925;-11.6741552892809;23.3483105785619;-
3.19718784581925;1.99828105742653e-32;12.8596374864398;-
```

```
2.98997630762174;-23.3483105785619;24.5575487911668;-
6.41209721742921;-24.5575487911668;25.7667870037716;-
6.41209721742921;-25.7667870037716;0.118398134054791;-
0.345496632172817;];

global D Sr_previous;


bnq = [M0*ones(42,1)-Fi(1:42,1:21)*Se_F1-Fi(1:42,1:21)*Sr_previ-
ous; M0*ones(42,1)-Fi(43:84,1:21)*Se_F1-Fi(43:84,1:21)*Sr_previ-
ous;
    M0*ones(42,1)-Fi(1:42,1:21)*Se_F2-Fi(1:42,1:21)*Sr_previous;
M0*ones(42,1)-Fi(43:84,1:21)*Se_F2-Fi(43:84,1:21)*Sr_previous;
    M0*ones(42,1)-Fi(1:42,1:21)*Se_F3-Fi(1:42,1:21)*Sr_previous;
M0*ones(42,1)-Fi(43:84,1:21)*Se_F3-Fi(43:84,1:21)*Sr_previous];

x0=zeros(21,1);
lb=[];
ub=[];
beq=zeros(17,1);

nonlcon=[]; %nera netiesiniu lygybiu ir neligybiu apribojimu
options=optimset('Algorithm','sqp','TolCon',1e-12,'TolFun',1e-
12,'TolX',1e-12,'MaxFunEvals',1e6,'MaxIter',1e6,'PlotFcns',{@op-
timplotfval,@optimplotfunccount});
%'PlotFcns',{@optimplotfval,@optimplotfunccount,@optimplotx,@op-
timplotconstrviolation,@optimplotfirstorderopt,@optimplotstepsize}
[x,fval,exitflag,output,lambda]=fmincon(@my-
fun_scan_Premo,x0,Anq,bnq,Aeq,beq,lb,ub,nonlcon,options);

Sr = x(1:21);

% Msum = Mr_previous + Me_max + Me_min + Mr %+ Me_FC;
Sr_sum_nauji=Sr_previous+Sr;
% takumo_sal_tikrinimas=[Mr_previous+Me_FC+Me_max+Mr-M0; -Mr_pre-
vious-Me_FC-Me_min-Mr-M0];
tak_sal_tik1=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F1-(M0*ones(84,1))];
tak_sal_tik2=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F2-(M0*ones(84,1))];
tak_sal_tik3=[Fi(1:84,1:21)*Sr_previ-
ous+Fi(1:84,1:21)*Sr+Fi(1:84,1:21)*Se_F3-(M0*ones(84,1))];

tak_sal_tik=[tak_sal_tik1 tak_sal_tik2 tak_sal_tik3];


for i=1:3; k=1:14; kt=i:3:42; kn=i+42:3:84;
 % 1-ai virsunei
   tst1(i,k)=tak_sal_tik1(kt); %teigiamos takumo salygu reiksmes
   tst2(i,k)=tak_sal_tik1(kn); %neigiamos takumo salygu reiksmes
 % 2-ai virsunei
```

```
   tst3(i,k)=tak_sal_tik2(kt);
   tst4(i,k)=tak_sal_tik2(kn);
 % 3-iai virsunei
   tst5(i,k)=tak_sal_tik3(kt);
   tst6(i,k)=tak_sal_tik3(kn);
end;

tst=[tst1;tst2;tst3;tst4;tst5;tst6];


% % Kinematines formuluotes rezultatai:
ur = lambda.eqlin;
plast_daug = lambda.ineqlin
Fi=[Fi(1:84,1:21);Fi(1:84,1:21);Fi(1:84,1:21)];
teta_p = Fi'*lambda.ineqlin
% ue=(A*inv(D)*A')^(-1);
% usum=ue+ur;


for i=1:3; k=1:14; kt=i:3:42; kn=i+42:3:84;
 % 1-ai virsunei
   pld1(i,k)=plast_daug(kt); %teigiamos takumo salygu reiksmes
   pld2(i,k)=plast_daug(kn); %neigiamos takumo salygu reiksmes
end;

for i=1:3; k=1:14; kt=i+84:3:126; kn=i+126:3:168;
 % 2-ai virsunei
   pld3(i,k)=plast_daug(kt);
   pld4(i,k)=plast_daug(kn);
end;

for i=1:3; k=1:14; kt=i+168:3:210; kn=i+210:3:252;
    % 3-iai virsunei
   pld5(i,k)=plast_daug(kt);
   pld6(i,k)=plast_daug(kn);
end;

pld=[pld1;pld2;pld3;pld4;pld5;pld6];

%influentines liekamuju dydziu matricos
G=((D^(-1))*A'*(A*(D^(-1))*A')^(-1))*A*(D^(-1))-(D^(-1));
H=((A*(D^(-1))*A')^(-1))*A*(D^(-1));

%patikirnimas per influentines liekamuju dydziu matricas ir plas-
tines
%deformacijas
% Mr_per_G=G*teta_p;
% ur_per_H=H*teta_p;

%KETVIRTO ETAPO (z=4) REZULTATU SPAUSDINIMAS EXCEL FORMATU
```

```
xlswrite('P2remo_analize_Srsum_plius_dSr_IV.xlsx',[Sr_previous';Se
_F1';Se_F2';Se_F3';Sr'],'S');
    xlswrite('P2remo_an-
alize_Srsum_plius_dSr_IV.xlsx',[tst;pld],'tak_sal ir pld');
    xlswrite('P2remo_an-
alize_Srsum_plius_dSr_IV.xlsx',teta_p','teta_pl');

% lambda.ineqlin
% takums=[Me_max+Mr -Me_min-Mr]
teta_p
exitflag %issprendimo pozymis
```



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B5. Funkcinio failo "myfun_scan_Premo.m" programinis kodas

```
function F=myfun_scan_Premo(x)
```

```
global D Sr_previous;
F=0.5*(x+Sr_previous)'*D*(x+Sr_previous);
```

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B6. Pagrindinės matricos

MATRICOS

A

0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	0
-0.25	-0.25	0	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	-1	0.285714	0.285714	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	0	0	-1	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	-0.28571	-0.28571	0	0.285714	0.285714	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	1	-0.25	-0.25	0	0	0	-1	0	0	0	0	0	0
0	0	0	0	0	0	-0.28571	-0.28571	0	0	0	-1	0.285714	0.285714	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	-1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	-0.28571	-0.28571	0	0.285714	0.285714	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	-0.25	-0.25	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.28571	-0.28571	0	0	0	-1

D

2.58E-05	-1.3E-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
-1.3E-05	2.58E-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	1.31E-06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	2.26E-05	-1.1E-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	-1.1E-05	2.26E-05	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1.15E-06	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	2.26E-05	-1.1E-05	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	-1.1E-05	2.26E-05	0	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	1.15E-06	0	0	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	2.58E-05	-1.3E-05	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	-1.3E-05	2.58E-05	0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	1.31E-06	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	2.26E-05	-1.1E-05	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	-1.1E-05	2.26E-05	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.15E-06	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.26E-05	-1.1E-05	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1.1E-05	2.26E-05	0	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.15E-06	0	0	0

0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2.58E-05	-1.3E-05	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-1.3E-05	2.58E-05	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1.31E-06

alfa

0.116868	-0.03521	-0.00858	0.071294	-0.37694	0.044101	-0.25048	-1.02168	-0.00029	-1.01343	-0.09245	-1.00518	0.001769	-0.99971	0.281696	-0.99424	-0.00147
1	0	3.47E-18	0	2.22E-16	1.39E-17	0	8.88E-16	1.08E-19	8.88E-16	0	4.44E-16	0	4.44E-16	0	2.22E-16	0
-0.00869	0.180902	0.152258	0.066326	-0.00874	-0.01194	-0.0176	-0.02318	-0.99968	-0.02325	-0.39995	-0.02331	-0.00072	-0.02344	0.073274	-0.02357	0.000401
-2.8E-17	1	-2.8E-17	0	-1.4E-17	1.39E-17	-5.6E-17	-2.8E-17	0	-8.3E-17	0	-2.8E-17	3.47E-18	-2.8E-17	1.11E-16	-5.6E-17	0
-0.03043	-0.36684	0.532902	0.23214	-0.0306	-0.0418	-0.06159	-0.08114	0.001106	-0.08137	-1.39981	-0.08159	-0.00251	-0.08204	0.25646	-0.08249	0.001402
-0.27922	0.008801	0.002145	-0.01782	0.094235	-0.01103	0.062619	-0.74458	7.34E-05	0.253357	0.023112	0.251294	-0.00044	0.249927	-0.07042	0.24856	0.000369
0.030428	0.366844	0.467098	-0.23214	0.030597	0.0418	0.061589	0.081142	-0.00111	0.081367	1.399812	0.081592	0.002508	0.082043	-0.25646	0.082494	-0.0014
-0.06086	0.266311	0.065803	0.46428	-0.06119	-0.0836	-0.12318	-0.16228	0.002212	-0.16273	0.700376	-0.16318	-0.00502	-0.16409	0.512919	-0.16499	0.002804
-0.27922	0.008801	0.002145	-0.01782	0.094235	-0.01103	0.062619	-0.74458	7.34E-05	-0.74664	0.023112	0.251294	-0.00044	0.249927	-0.07042	0.24856	0.000369
-2.2E-16	-2.8E-17	-3.5E-18	5.55E-17	1	5.55E-17	-2.2E-16	-8.9E-16	-3.3E-19	-4.4E-16	-5.6E-17	-8.9E-16	8.67E-19	-4.4E-16	1.11E-16	-6.7E-16	-8.7E-19
-0.37694	-0.0354	-0.00863	0.071689	0.12097	0.044345	-0.25187	-1.00518	-0.0003	-1.00796	-0.09296	-1.01075	0.001778	-1.00525	0.283258	-0.99975	-0.00148
0.052348	-0.22908	-0.16413	0.030726	0.052639	0.179436	0.105956	0.139596	-0.00072	0.139983	-0.72672	0.140369	-0.99806	0.141145	-0.56547	0.141921	-0.00123
0.060857	-0.26631	-0.0658	0.53572	0.061194	0.0836	0.123177	0.162284	-0.00221	0.162734	-0.70038	0.163184	0.005016	0.164086	-0.51292	0.164988	-0.0028
0.091934	0.09769	0.024258	-0.19604	0.092444	0.502627	0.186081	0.245159	0.00081	0.245838	0.257054	0.246517	-0.00073	0.24788	-1.20976	0.249243	-8.4E-05
-0.18498	0.017651	0.004302	-0.03575	-0.18601	-0.02211	0.125585	-0.49329	0.000147	-0.49465	0.046353	-0.49602	-0.00089	0.501239	-0.14124	0.498497	0.000739
-0.09193	-0.09769	-0.02426	0.196039	-0.09244	0.497373	-0.18608	-0.24516	-0.00081	-0.24584	-0.25705	-0.24652	0.000726	-0.24788	1.20976	-0.24924	8.39E-05
0.244725	-0.07093	-0.01729	0.143643	0.246082	0.088854	0.495339	0.652601	-0.00059	0.65441	-0.18627	0.656219	0.003563	0.659846	0.567562	0.663473	-0.00297
-0.18498	0.017651	0.004302	-0.03575	-0.18601	-0.02211	0.125585	-0.49329	0.000147	-0.49465	0.046353	-0.49602	-0.00089	-0.49876	-0.14124	0.498497	0.000739
-0.24473	0.070931	0.017288	-0.14364	-0.24608	-0.08885	0.504661	-0.6526	0.000592	-0.65441	0.186267	-0.65622	-0.00356	-0.65985	-0.56756	-0.66347	0.002972
-0.4952	-0.00033	-7.9E-05	0.00066	-0.49795	0.000408	-0.00232	-1.32054	-2.7E-06	-1.3242	-0.00086	-1.32786	1.64E-05	-1.3352	0.002608	-1.34254	-1.4E-05
-0.04365	0.048177	0.01187	-0.09705	-0.0439	-0.16749	-0.08836	-0.11641	0.000401	-0.11673	0.126663	-0.11706	-0.00123	-0.1177	-0.50781	-0.11835	-0.99917

G

-28814.4	3.64E-12	224.2932	4.55E-13	785.0263	7203.592	-785.026	1570.053	7203.592	2.73E-12	9724.791	-1350.55	-1570.05	-2371.84	4772.395	2371.84	-6313.73	4772.395	6313.733	12775.85	1126.255
-3.6E-12	7.28E-12	-8.3E-14	1.05E-13	2.07E-13	0	2.05E-13	1.02E-13	-3.9E-10	2.86E-12	-2.9E-12	0	4.09E-13	8.18E-13	0	8.18E-13	4.09E-13	-1.9E-10	-4.3E-12	-4.3E-12	0
224.2932	-2.8E-14	-241.304	-1.3E-12	-844.564	-56.0733	844.5635	-1689.13	-56.0733	0	225.5365	547.1658	1689.127	-618.61	-112.457	618.6104	451.9063	-112.457	-451.906	2.076649	-305.862
-1.8E-13	-9E-13	0	-2.9E-11	-1.5E-11	-4.8E-11	-1.7E-12	-9.1E-13	4.84E-11	-1.8E-13	1.79E-13	-2.6E-12	-2.3E-12	-1.9E-12	0	1.99E-12	-5.8E-14	-2.4E-11	-1.8E-12	-3.6E-13	0
785.0263	-4.5E-13	-844.564	-1.5E-11	-2955.97	-196.257	2955.972	-5911.94	-196.257	-5.7E-13	789.3776	1915.08	5911.945	-2165.14	-393.601	2165.136	1581.672	-393.601	-1581.67	7.26827	-1070.52
7203.592	2.75E-10	-56.0733	1.52E-11	-196.257	-1800.9	196.2566	-392.513	-1800.9	-1.8E-10	-2431.2	337.6371	392.5131	592.9601	-1193.1	-592.96	1578.433	-1193.1	-1578.43	-3193.96	-281.564
-785.026	-1.1E-13	844.5635	8.19E-12	2955.972	196.2566	-2955.97	5911.945	196.2566	-1.1E-13	-789.378	-1915.08	-5911.94	2165.136	393.601	-2165.14	-1581.67	393.601	1581.672	-7.26827	1070.517
1570.053	-1.6E-12	-1689.13	1.82E-11	-5911.94	-392.513	5911.945	-11823.9	-392.513	-4.5E-13	1578.755	3830.161	11823.89	-4330.27	-787.202	4330.273	3163.344	-787.202	-3163.34	14.53654	-2141.03
7203.592	-2.7E-10	-56.0733	-6.8E-11	-196.257	-1800.9	196.2566	-392.513	-1800.9	-9.2E-11	-2431.2	337.6371	392.5131	592.9601	-1193.1	-592.96	1578.433	-1193.1	-1578.43	-3193.96	-281.564
1.15E-11	5.73E-12	2.48E-13	-3.4E-13	3.72E-13	3.88E-10	7.31E-15	1.75E-12	-3.9E-10	0	7.28E-12	-6.6E-13	2.13E-12	2.13E-12	3.88E-10	-4.5E-13	-8.6E-12	-1.9E-10	1.43E-12	7.16E-12	6.62E-13
9724.791	-1.8E-12	225.5365	2.27E-13	789.3776	-2431.2	-789.378	1578.755	-2431.2	0	-28920.2	-1358.03	-1578.76	-2384.99	4798.848	2384.987	-6348.73	4798.848	6348.73	12846.66	1132.498
-1350.55	-2.3E-13	547.1658	0	1915.08	337.6371	-1915.08	3830.161	337.6371	-1.1E-13	-1358.03	-1483.06	-3830.16	554.5368	677.1457	-554.537	-2721.09	677.1457	2721.087	-12.5042	935.8925
-1570.05	0	1689.127	4.09E-12	5911.945	392.5131	-5911.94	11823.89	392.5131	-4.5E-13	-1578.76	-3830.16	-11823.9	4330.273	787.2019	-4330.27	-3163.34	787.2019	3163.344	-14.5365	2141.033

-2371.84	0	-618.61	2.73E-12	-2165.14	592.9601	2165.136	-4330.27	592.9601	-1.1E-12	-2384.99	554.5368	4330.273	-4554.53	1189.207	4554.53	-4778.79	1189.207	4778.788	-21.96	64.07356
4772.395	-9.2E-11	-112.457	6.14E-11	-393.601	-1193.1	393.601	-787.202	-1193.1	9.09E-11	4798.848	677.1457	787.2019	1189.207	-2392.81	-1189.21	3165.616	-2392.81	-3165.62	-6405.63	-564.688
2371.84	2.27E-13	618.6104	-1.1E-12	2165.136	-592.96	-2165.14	4330.273	-592.96	-2.7E-12	2384.987	-554.537	-4330.27	4554.53	-1189.21	-4554.53	4778.788	-1189.21	-4778.79	21.96	-64.0736
-6313.73	-1.8E-12	451.9063	-4.5E-13	1581.672	1578.433	-1581.67	3163.344	1578.433	-3.6E-12	-6348.73	-2721.09	-3163.34	-4778.79	3165.616	4778.788	-12720.9	3165.616	12720.92	-58.4565	2269.181
4772.395	1.83E-10	-112.457	-2.3E-11	-393.601	-1193.1	393.601	-787.202	-1193.1	3.66E-10	4798.848	677.1457	787.2019	1189.207	-2392.81	-1189.21	3165.616	-2392.81	-3165.62	-6405.63	-564.688
6313.733	4.55E-12	-451.906	-2.3E-13	-1581.67	-1578.43	1581.672	-3163.34	-1578.43	-2.7E-12	6348.73	2721.087	3163.344	4778.788	-3165.62	-4778.79	12720.92	-3165.62	-12720.9	58.45654	-2269.18
12775.85	-7.3E-12	2.076649	-4.3E-13	7.26827	-3193.96	-7.26827	14.53654	-3193.96	-5.5E-12	12846.66	-12.5042	-14.5365	-21.96	-6405.63	21.96	-58.4565	-6405.63	58.45654	-25681	10.42758
1126.255	-1.1E-13	-305.862	1.14E-13	-1070.52	-281.564	1070.517	-2141.03	-281.564	-3.4E-13	1132.498	935.8925	2141.033	64.07356	-564.688	-64.0736	2269.181	-564.688	-2269.18	10.42758	-630.031

H

0.116868	1	-0.00869	0	-0.03043	-0.27922	0.030428	-0.06086	-0.27922	1.11E-16	-0.37694	0.052348	0.060857	0.091934	-0.18498	-0.09193	0.244725	-0.18498	-0.24473	-0.4952	-0.04365
-0.03521	3.47E-18	0.180902	1	-0.36684	0.008801	0.366844	0.266311	0.008801	3.47E-18	-0.0354	-0.22908	-0.26631	0.09769	0.017651	-0.09769	-0.07093	0.017651	0.070931	-0.00033	0.048177
-0.00858	0	0.152258	0	0.532902	0.002145	0.467098	0.065803	0.002145	8.67E-19	-0.00863	-0.16413	-0.0658	0.024258	0.004302	-0.02426	-0.01729	0.004302	0.017288	-7.9E-05	0.01187
0.071294	-6.9E-18	0.066326	0	0.23214	-0.01782	-0.23214	0.46428	-0.01782	-1.4E-17	0.071689	0.030726	0.53572	-0.19604	-0.03575	0.196039	0.143643	-0.03575	-0.14364	0.00066	-0.09705
-0.37694	-5.6E-17	-0.00874	3.47E-18	-0.0306	0.094235	0.030597	-0.06119	0.094235	1	0.12097	0.052639	0.061194	0.092444	-0.18601	-0.09244	0.246082	-0.18601	-0.24608	-0.49795	-0.0439
0.044101	6.94E-18	-0.01194	1.04E-17	-0.0418	-0.01103	0.0418	-0.0836	-0.01103	-6.9E-18	0.044345	0.179436	0.0836	0.502627	-0.02211	0.497373	0.088854	-0.02211	-0.08885	0.000408	-0.16749
-0.25048	0	-0.0176	-1.4E-17	-0.06159	0.062619	0.061589	-0.12318	0.062619	2.78E-17	-0.25187	0.105956	0.123177	0.186081	0.125585	-0.18608	0.495339	0.125585	0.504661	-0.00232	-0.08836
-1.02168	-1.1E-16	-0.02318	1.39E-17	-0.08114	-0.74458	0.081142	-0.16228	-0.74458	2.22E-16	-1.00518	0.139596	0.162284	0.245159	-0.49329	-0.24516	0.652601	-0.49329	-0.6526	-1.32054	-0.11641
-0.00029	5.42E-20	-0.99968	1.52E-18	0.001106	7.34E-05	-0.00111	0.002212	7.34E-05	-2.7E-20	-0.0003	-0.00072	-0.00221	0.00081	0.000147	-0.00081	-0.00059	0.000147	0.000592	-2.7E-06	0.000401
-1.01343	-1.1E-16	-0.02325	1.39E-17	-0.08137	0.253357	0.081367	-0.16273	-0.74664	2.22E-16	-1.00796	0.139983	0.162734	0.245838	-0.49465	-0.24584	0.65441	-0.49465	-0.65441	-1.3242	-0.11673
-0.09245	1.39E-17	-0.39995	0	-1.39981	0.023112	1.399812	0.700376	0.023112	6.94E-18	-0.09296	-0.72672	-0.70038	0.257054	0.046353	-0.25705	-0.18627	0.046353	0.186267	-0.00086	0.126663
-1.00518	0	-0.02331	-6.9E-18	-0.08159	0.251294	0.081592	-0.16318	0.251294	1.11E-16	-1.01075	0.140369	0.163184	0.246517	-0.49602	-0.24652	0.656219	-0.49602	-0.65622	-1.32786	-0.11706
0.001769	0	-0.00072	3.04E-18	-0.00251	-0.00044	0.002508	-0.00502	-0.00044	-2.2E-19	0.001778	-0.99806	0.005016	-0.00073	-0.00089	0.000726	0.003563	-0.00089	-0.00356	1.64E-05	-0.00123
-0.99971	-1.1E-16	-0.02344	-6.9E-18	-0.08204	0.249927	0.082043	-0.16409	0.249927	0	-1.00525	0.141145	0.164086	0.24788	0.501239	-0.24788	0.659846	-0.49876	-0.65985	-1.3352	-0.1177
0.281696	0	0.073274	2.78E-17	0.25646	-0.07042	-0.25646	0.512919	-0.07042	0	0.283258	-0.56547	-0.51292	-1.20976	-0.14124	1.20976	0.567562	-0.14124	-0.56756	0.002608	-0.50781
-0.99424	1.11E-16	-0.02357	6.94E-18	-0.08249	0.24856	0.082494	-0.16499	0.24856	2.22E-16	-0.99975	0.141921	0.164988	0.249243	0.498497	-0.24924	0.663473	0.498497	-0.66347	-1.34254	-0.11835
-0.00147	0	0.000401	0	0.001402	0.000369	-0.0014	0.002804	0.000369	4.34E-19	-0.00148	-0.00123	-0.0028	-8.4E-05	0.000739	8.39E-05	-0.00297	0.000739	0.002972	-1.4E-05	-0.99917

B7. Etapinio skaičiavimo rezultatai

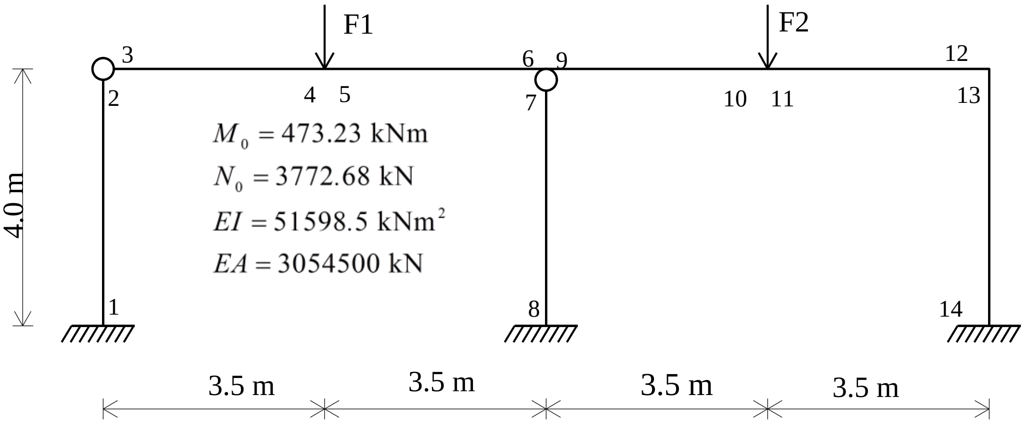
L.Liepa 2016-04-28 18:41

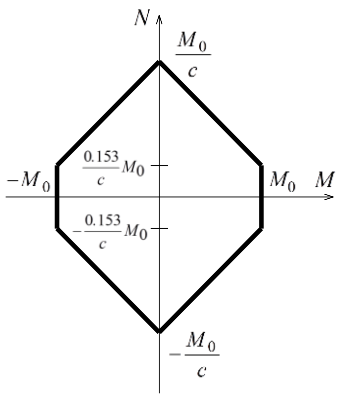
1. 2P remo analizė pagal 0.5(Srsum+dSr)'D(Srsum+dSr), tiesioginė

Kintama kartotinė apkrova (KKA):

$0 \le F1 \le 341$ kN,

$0 \le F2 \le 440$ kN.





Find:

$$\min \quad \frac{1}{2}\left(\boldsymbol{S}_{r\Sigma}+\Delta\boldsymbol{S}_r\right)^T \boldsymbol{D}\left(\boldsymbol{S}_{r\Sigma}+\Delta\boldsymbol{S}_r\right)$$

Subject to:

$$\boldsymbol{A}\Delta\boldsymbol{S}_r = \boldsymbol{0},$$
$$\boldsymbol{\Phi}\left(\boldsymbol{S}_{r\Sigma}+\boldsymbol{S}_{e,j}+\Delta\boldsymbol{S}_r\right) \le \boldsymbol{M}_0.$$

j – toji apkrovos viršūnė	Kai trys KKA viršūnės, konstrukcijos takumo salygos užrašomos:		Takumo sąlygos *i*-tajam pjūviui, *j*-tajai KKA viršūnei, išskleista forma:
	$\boldsymbol{\Phi}\left(\boldsymbol{S}_{r\Sigma}+\boldsymbol{S}_{e,1}+\Delta\boldsymbol{S}_r\right)-\boldsymbol{M}_0 \le 0.$ $\boldsymbol{\Phi}\left(\boldsymbol{S}_{r\Sigma}+\boldsymbol{S}_{e,2}+\Delta\boldsymbol{S}_r\right)-\boldsymbol{M}_0 \le 0.$ $\boldsymbol{\Phi}\left(\boldsymbol{S}_{r\Sigma}+\boldsymbol{S}_{e,3}+\Delta\boldsymbol{S}_r\right)-\boldsymbol{M}_0 \le 0.$	1	$M_{r\Sigma}+M_{ei,j}+\Delta M_{ri}-M_{oi} \le 0$
		2	$M_{ri\Sigma}/1.18+cN_{ri\Sigma}+M_{ei,j}/1.18+cN_{ei,j}+\Delta M_{ri}/1.18+c\Delta N_{ri}-M_{oi} \le 0$
		3	$M_{ri\Sigma}/1.18-cN_{ri\Sigma}+M_{ei,j}/1.18-cN_{ei,j}+\Delta M_{ri}/1.18-c\Delta N_{ri}-M_{oi} \le 0$
		4	$-M_{ri\Sigma}-M_{ei,j}-\Delta M_{ri}-M_{oi} \le 0$
		5	$-M_{ri\Sigma}/1.18+cN_{ri\Sigma}-M_{ei,j}/1.18+cN_{ei,j}-\Delta M_{ri}/1.18+c\Delta N_{ri}-M_{oi} \le 0$
		6	$-M_{ri\Sigma}/1.18-cN_{ri\Sigma}-M_{ei,j}/1.18-cN_{ei,j}-\Delta M_{ri}/1.18-c\Delta N_{ri}-M_{oi} \le 0$

Analizė

I etapas $0 \leq F1 \leq 341$ kN

		1 pj.	2 pj.	N1-2	3 pj.	4 pj.	N3-4	5 pj.	6 pj.	N5-6	7 pj.	8 pj.	N7-8	9 pj.	10 pj.	N9-10	11 pj.	12 pj.	N11-12	13 pj.	14 pj.	N13-14
$S_{r\Sigma}$		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Se_F1		-31.5251	0	-136.382	0	-477.336	7.881286	477.336	238.8281	7.881286	-1.9E-14	-31.6999	-247.81	-238.828	87.65557	15.80626	-87.6556	-63.5169	15.80626	63.51691	-0.29188	43.19214
Se_F2																						
Se_F3																						
ΔS_r		-1.09022	-2.9E-33	1.172906	2.85E-33	4.105172	0.272556	-4.10517	8.210345	0.272556	0	-1.09626	-2.65961	-8.21034	3.006881	0.546622	-3.00688	-2.19658	0.546622	2.196582	-0.01009	1.486704
Takumo sąl. tikrinimas	**1 virš.**	-505.846	-473.231		-473.231	-946.462		0	-226.192		-473.231	-506.027		-720.269	-382.568		-563.893	-538.944		-407.517	-473.533	
		-517.831	-490.191		-472.208	-873.251		-71.165	-262.853		-504.649	-532.442		-680.534	-394.347		-548.012	-526.869		-411.937	-467.882	
		-483.911	-456.271		-474.254	-875.297		-73.2105	-264.899		-441.813	-469.606		-684.637	-398.449		-552.115	-530.971		-423.146	-479.091	
		-440.615	-473.231		-473.231	0		-946.462	-720.269		-473.231	-440.435		-226.192	-563.893		-382.568	-407.517		-538.944	-472.929	
		-462.551	-490.191		-472.208	-71.165		-873.251	-681.563		-504.649	-476.855		-261.825	-548.012		-394.347	-415.49		-523.316	-467.371	
		-428.631	-456.271		-474.254	-73.2105		-875.297	-683.608		-441.813	-414.019		-265.927	-552.115		-398.449	-419.593		-534.525	-478.579	
	2 virš.																					
	3 virš.																					
lambda nuo 1 virš.		0	0		0	0		0.001389	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
lambda nuo 2 virš.																						
lambda nuo 3 virš.																						

teta_pl	0	0	0	0	0	0	0.001389	0	0	0	0	0	0	0	0	0	0	0	0	0	0

II etapas
$0 \le F1 \le 341$ kN
$0 \le \mathrm{F2} \le 398.3159$ kN

		1 pj.	2 pj.	N1-2	3 pj.	4 pj.	N3-4	5 pj.	6 pj.	N5-6	7 pj.	8 pj.	N7-8	9 pj.	10 pj.	N9-10	11 pj.	12 pj.	N11-12	13 pj.	14 pj.	N13-14
$S_{r\Sigma}$		-1.09022	-2.9E-33	1.172906	2.85E-33	4.105172	0.272556	-4.10517	8.210345	0.272556	0	-1.09626	-2.65961	-8.21034	3.006881	0.546622	-3.00688	-2.19658	0.546622	2.196582	-0.01009	1.486704
Se_F1		-31.5251	0	-136.382	0	-477.336	7.881286	477.336	238.8281	7.881286	-1.9E-14	-31.6999	-247.81	-238.828	87.65557	15.80626	-87.6556	-63.5169	15.80626	63.51691	-0.29188	43.19214
Se_F2		112.2041	0	29.18626	4.42E-14	102.1519	-28.051	-102.152	204.3038	-28.051	4.42E-14	112.826	-225.235	-204.304	-481.866	-56.2575	481.8665	226.0689	-56.2575	-226.069	1.038856	-202.267
Se_F3		80.67892	0	-107.195	4.42E-14	-375.184	-20.1697	375.1841	443.1319	-20.1697	2.53E-14	81.12611	-473.045	-443.132	-394.211	-40.4513	394.2109	162.552	-40.4513	-162.552	0.746976	-159.075
ΔS_r		5.587379	-2.3E-33	1.57E-05	1.21E-32	5.5E-05	-1.39684	-5.5E-05	0.00011	-1.39684	6.19E-33	5.61835	1.608176	-0.00011	5.62878	-2.80143	-5.62878	11.25745	-2.80143	-11.2575	0.051722	-1.60819
Takumo sąl. tikrinimas	1 virš.	-500.259	-473.231		-473.231	-946.462		-5.5E-05	-226.192		-473.231	-500.409		-720.269	-376.94		-569.522	-527.687		-418.775	-473.481	
		-513.096	-490.191		-472.383	-873.426		-71.3402	-263.029		-504.447	-527.479		-680.886	-389.928		-553.134	-517.68		-421.679	-468.04	
		-479.176	-456.271		-474.078	-875.121		-73.0354	-264.724		-442.015	-465.047		-684.285	-393.328		-556.533	-521.08		-432.484	-478.845	
		-446.203	-473.231		-473.231	-5.5E-05		-946.462	-720.269		-473.231	-446.053		-226.192	-569.522		-376.94	-418.775		-527.687	-472.981	
		-467.286	-490.191		-472.383	-71.3402		-873.426	-681.738		-504.447	-481.415		-262.176	-553.134		-389.928	-425.382		-513.977	-467.616	
		-433.366	-456.271		-474.078	-73.0354		-875.121	-683.433		-442.015	-418.982		-265.576	-556.533		-393.328	-428.781		-524.783	-478.421	
	2 virš.	-356.53	-473.231		-473.231	-366.974		-579.488	-260.717		-473.231	-355.883		-685.745	-946.462		-5.7E-14	-238.101		-708.361	-472.15	
		-370.523	-469.423		-476.89	-386.842		-566.939	-296.794		-501.615	-402.168		-660.667	-881.613		-79.5273	-281.308		-697.88	-497.702	
		-378.14	-477.039		-469.571	-379.523		-559.62	-289.474		-444.846	-345.399		-645.988	-866.934		-64.8482	-266.629		-647.106	-446.928	
		-589.932	-473.231		-473.231	-579.488		-366.974	-685.745		-473.231	-590.579		-260.717	0		-946.462	-708.361		-238.101	-474.311	
		-568.322	-469.423		-476.89	-566.939		-386.842	-656.987		-501.615	-601.063		-300.474	-79.5273		-881.613	-679.833		-299.355	-499.533	
		-575.938	-477.039		-469.571	-559.62		-379.523	-649.668		-444.846	-544.294		-285.794	-64.8482		-866.934	-665.154		-248.581	-448.76	
	3 virš.	-388.055	-473.231		-473.231	-844.31		-102.152	-21.8885		-473.231	-387.583		-924.573	-858.806		-87.6556	-301.618		-644.844	-472.442	
		-414.347	-486.53		-475.902	-790.375		-161.428	-93.4084		-532.7	-460.116		-861.081	-805.346		-151.829	-333.153		-638.634	-492.532	
		-387.749	-459.932		-470.56	-785.033		-156.086	-88.0663		-413.762	-341.179		-850.367	-794.633		-141.115	-322.439		-598.696	-452.593	
		-558.407	-473.231		-473.231	-102.152		-844.31	-924.573		-473.231	-558.879		-21.8885	-87.6556		-858.806	-644.844		-301.618	-474.019	
		-558.713	-486.53		-475.902	-161.428		-790.375	-858.395		-532.7	-605.283		-96.0942	-151.829		-805.346	-624.022		-347.765	-493.868	
		-532.115	-459.932		-470.56	-156.086		-785.033	-853.053		-413.762	-486.345		-85.3804	-141.115		-794.633	-613.309		-307.827	-453.93	
lambda nuo 1 virš.		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
lambda nuo 2 virš.		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0.001896		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
lambda nuo 3 virš.		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	
		0	0		0	0		0	0		0	0		0	0		0	0		0	0	

	1 pj.	2 pj.	N1-2	3 pj.	4 pj.	N3-4	5 pj.	6 pj.	N5-6	7 pj.	8 pj.	N7-8	9 pj.	10 pj.	N9-10	11 pj.	12 pj.	N11-12	13 pj.	14 pj.	N13-14
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
teta_pl	0	0	0	0	0	0	0	0	0	0	0	0	0	-0.0019	0	0	0	0	0	0	0

III etapas $0 \le F1 \le 341$ kN, $0 \le F2 \le 411.4771$ kN

	1 pj.	2 pj.	N1-2	3 pj.	4 pj.	N3-4	5 pj.	6 pj.	N5-6	7 pj.	8 pj.	N7-8	9 pj.	10 pj.	N9-10	11 pj.	12 pj.	N11-12	13 pj.	14 pj.	N13-14
$S_{r\Sigma}$	4.497151	7.16E-34	1.172922	2.72E-33	4.105227	-1.12429	-4.10523	8.210454	-1.12429	2.8E-32	4.522079	-1.05143	-8.21045	8.635661	-2.25481	-8.63566	9.060868	-2.25481	-9.06087	0.041638	-0.12149
Se_F1	-31.5251	0	-136.382	0	-477.336	7.881286	477.336	238.8281	7.881286	-1.9E-14	-31.6999	-247.81	-238.828	87.65557	15.80626	-87.6556	-63.5169	15.80626	63.51691	-0.29188	43.19214
Se_F2	115.9115	0	30.15063	4.57E-14	105.5272	-28.9779	-105.527	211.0544	-28.9779	4.57E-14	116.554	-232.677	-211.054	-497.788	-58.1164	497.7883	233.5387	-58.1164	-233.539	1.073182	-208.951
Se_F3	84.38638	0	-106.231	4.57E-14	-371.809	-21.0966	371.8088	449.8825	-21.0966	2.68E-14	84.85412	-480.488	-449.882	-410.133	-42.3101	410.1328	170.0218	-42.3101	-170.022	0.781302	-165.758
ΔS_r	8.2916	-8.3E-34	2.162551	8.46E-34	7.568928	-2.0729	-7.56893	15.13786	-2.0729	-8E-33	8.337558	-1.93854	-15.1379	15.92189	-4.15729	-15.9219	16.70592	-4.15729	-16.7059	0.07676	-0.22401
Takumo sąl. tikrinimas, 1 virš.	-491.967	-473.231		-473.231	-938.893		-7.56898	-211.054		-473.231	-492.071		-735.407	-361.018		-585.444	-510.981		-435.481	-473.404	
	-505.798	-489.92		-472.643	-867.272		-78.0146	-250.46		-504.69	-520.657		-694.236	-376.957		-567.148	-504.044		-435.865	-468.003	
	-472.42	-456.542		-473.818	-868.447		-79.1897	-251.635		-441.771	-457.738		-696.593	-379.313		-569.505	-506.401		-446.614	-478.752	
	-454.494	-473.231		-473.231	-7.56898		-938.893	-735.407		-473.231	-454.391		-211.054	-585.444		-361.018	-435.481		-510.981	-473.057	
	-474.041	-489.92		-472.643	-78.0146		-867.272	-694.827		-504.69	-488.724		-249.869	-567.148		-376.957	-440.061		-499.848	-467.709	
	-440.664	-456.542		-473.818	-79.1897		-868.447	-696.002		-441.771	-425.805		-252.226	-569.505		-379.313	-442.418		-510.597	-478.458	
2 virš.	-344.531	-473.231		-473.231	-356.029		-590.432	-238.828		-473.231	-343.817		-707.634	-946.462		-1.1E-13	-213.925		-732.536	-472.039	
	-359.962	-469.03		-477.267	-377.944		-576.59	-278.62		-502.792	-393.119		-679.971	-882.368		-80.282	-261.575		-719.235	-498.474	
	-368.363	-477.431		-469.195	-369.872		-568.518	-270.548		-443.67	-333.997		-663.783	-866.18		-64.0935	-245.386		-666.728	-445.968	
	-601.931	-473.231		-473.231	-590.432		-356.029	-707.634		-473.231	-602.644		-238.828	0		-946.462	-732.536		-213.925	-474.422	
	-578.098	-469.03		-477.267	-576.59		-377.944	-675.913		-502.792	-612.465		-282.679	-80.282		-882.368	-701.075		-279.734	-500.494	
	-586.499	-477.431		-469.195	-568.518		-369.872	-667.841		-443.67	-553.342		-266.49	-64.0935		-866.18	-684.887		-227.227	-447.987	
3 virš.	-376.056	-473.231		-473.231	-833.365		-113.096	-2.3E-13		-473.231	-375.517		-946.462	-858.806		-87.6556	-277.442		-669.019	-472.331	
	-403.786	-486.138		-476.278	-781.477		-171.079	-75.2351		-533.876	-451.068		-880.385	-806.101		-152.584	-313.42		-659.989	-493.304	
	-377.972	-460.324		-470.183	-775.382		-164.985	-69.1404		-412.585	-329.777		-868.162	-793.878		-140.361	-301.197		-618.318	-451.633	
	-570.406	-473.231		-473.231	-113.096		-833.365	-946.462		-473.231	-570.945		0	-87.6556		-858.806	-669.019		-277.442	-474.131	
	-568.489	-486.138		-476.278	-171.079		-781.477	-877.321		-533.876	-616.685		-78.2993	-152.584		-806.101	-645.265		-328.144	-494.829	
	-542.676	-460.324		-470.183	-164.985		-775.382	-871.227		-412.585	-495.393		-66.0762	-140.361		-793.878	-633.042		-286.473	-453.158	
lambda nuo 1 virš.	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
lambda nuo 2 virš.	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0.005392		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	

lambda nuo 3 virš.	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		8.57E-09	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
teta_pl	0	0	0	0	0	0	0	0	0	0	0	0	-8.6E-09	-0.00539	0	0	0	0	0	0	0

IV etapas $0 \le F1 \le 341$ kN

$0 \le F2 \le 440$ kN

	1 pj.	2 pj.	N1-2	3 pj.	4 pj.	N3-4	5 pj.	6 pj.	N5-6	7 pj.	8 pj.	N7-8	9 pj.	10 pj.	N9-10	11 pj.	12 pj.	N11-12	13 pj.	14 pj.	N13-14
$S_{r\Sigma}$	12.78875	-1.1E-34	3.335473	3.57E-33	11.67416	-3.19719	-11.6742	23.34831	-3.19719	2E-32	12.85964	-2.98998	-23.3483	24.55755	-6.4121	-24.5575	25.76679	-6.4121	-25.7668	0.118398	-0.3455
Se_F1	-31.5251	0	-136.382	0	-477.336	7.881286	477.336	238.8281	7.881286	-1.9E-14	-31.6999	-247.81	-238.828	87.65557	15.80626	-87.6556	-63.5169	15.80626	63.51691	-0.29188	43.19214
Se_F2	123.9463	0	32.24062	4.88E-14	112.8422	-30.9866	-112.842	225.6844	-30.9866	4.88E-14	124.6333	-248.806	-225.684	-532.294	-62.1449	532.2942	249.7272	-62.1449	-249.727	1.147573	-223.435
Se_F3	92.42117	0	-104.141	4.88E-14	-364.494	-23.1053	364.4938	464.5124	-23.1053	2.99E-14	92.93345	-496.616	-464.512	-444.639	-46.3387	444.6386	186.2103	-46.3387	-186.21	0.855694	-180.243
ΔS_r	41.51358	8.34E-38	-2.08999	-8.9E-34	-7.31497	-10.3784	7.314969	-14.6299	-10.3784	-7.7E-34	41.7437	16.12879	14.62994	34.50585	-20.8143	-34.5059	83.64164	-20.8143	-83.6416	0.384361	-14.0388
Takumo sąl. tikrinimas, 1 virš.	-450.454	-473.231		-473.231	-946.208		-0.25401	-225.684		-473.231	-450.327		-720.777	-326.512		-619.95	-427.339		-519.122	-473.02	
	-470.879	-490.182		-473.945	-874.773		-73.1173	-264.16		-502.667	-483.257		-684.448	-350.325		-599.001	-435.772		-508.508	-469.439	
	-436.977	-456.28		-472.517	-873.344		-71.6887	-262.731		-443.794	-424.385		-681.583	-347.46		-596.136	-432.907		-515.735	-476.666	
	-496.008	-473.231		-473.231	-0.25401		-946.208	-720.777		-473.231	-496.134		-225.684	-619.95		-326.512	-519.122		-427.339	-473.442	
	-509.484	-490.182		-473.945	-73.1173		-874.773	-683.73		-502.667	-522.077		-264.878	-599.001		-350.325	-513.554		-430.726	-469.796	
	-475.583	-456.28		-472.517	-71.6887		-873.344	-682.302		-443.794	-463.204		-262.013	-596.136		-347.46	-510.689		-437.953	-477.023	
2 virš.	-294.982	-473.231		-473.231	-356.029		-590.432	-238.828		-473.231	-293.994		-707.634	-946.462		-1.1E-13	-114.095		-832.366	-471.58	
	-317.972	-469.03		-478.821	-379.497		-578.144	-280.174		-502.792	-350.897		-683.088	-885.484		-83.3982	-180.089		-807.414	-501.663	
	-326.373	-477.431		-467.641	-368.318		-566.964	-268.995		-443.67	-291.774		-660.667	-863.063		-60.9773	-157.668		-747.752	-442.001	
	-651.479	-473.231		-473.231	-590.432		-356.029	-707.634		-473.231	-652.467		-238.828	0		-946.462	-832.366		-114.095	-474.881	
	-620.089	-469.03		-478.821	-578.144		-379.497	-677.467		-502.792	-654.687		-285.795	-83.3982		-885.484	-788.793		-198.71	-504.461	
	-628.489	-477.431		-467.641	-566.964		-368.318	-666.287		-443.67	-595.565		-263.374	-60.9773		-863.063	-766.373		-139.047	-444.798	
3 virš.	-326.507	-473.231		-473.231	-833.365		-113.096	-2.8E-13		-473.231	-325.694		-946.462	-858.806		-87.6556	-177.612		-768.85	-471.872	
	-361.796	-486.138		-477.832	-783.031		-172.633	-76.7889		-533.876	-408.845		-883.502	-809.217		-155.7	-231.934		-748.168	-496.493	
	-335.982	-460.324		-468.63	-773.829		-163.431	-67.5866		-412.585	-287.554		-865.046	-790.762		-137.244	-213.479		-699.342	-447.666	
	-619.954	-473.231		-473.231	-113.096		-833.365	-946.462		-473.231	-620.768		0	-87.6556		-858.806	-768.85		-177.612	-474.589	
	-610.48	-486.138		-477.832	-172.633		-783.031	-878.875		-533.876	-658.908		-81.4155	-155.7		-809.217	-732.983		-247.12	-498.795	
	-584.666	-460.324		-468.63	-163.431		-773.829	-869.673		-412.585	-537.616		-62.96	-137.244		-790.762	-714.527		-198.293	-449.969	
lambda nuo 1 virš.	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
lambda nuo 2 virš.	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	

	0	0		0	0		0	0		0	0		0	0.01882		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
lambda nuo 3 virš.	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0.006155	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
	0	0		0	0		0	0		0	0		0	0		0	0		0	0	
teta_pl	0	0	0	0	0	0	0	0	0	0	0	0	-0.00616	-0.01882	0	0	0	0	0	0	0