```
n = input( 'Give size:');
format long g
tStart = tic;
a1=zeros(n,n);
for i=1:n;  %kyria diagwnios
  a1(i,i)=6;
endfor
for i=1:n-1;
  a1(i,i+1)=-4;
endfor
for i=2:n;
  a1(i,i-1)=-4;
endfor
for i=1:n-2;
  a1(i,i+2)=1;
endfor
for i=3:n;
  a1(i,i-2)=1;
endfor
b1=zeros(n,1);
b1(1)=3;
b1(n)=3;
b1(2)=-1;
b1(n-1)=-1;
L=zeros(n);
L(1,1)=sqrt(a1(1,1));
L(2,1)=a1(2,1)/L(1,1);
L(2,2)=sqrt(a1(2,2)-L(2,1)^2);
L(3,1) = a1(3,1)/L(1,1);
L(3,2)=(a1(3,2)-L(3,1)*L(2,1))/L(2,2);
L(3,3)=sqrt(a1(3,3)-(L(3,1))^2-(L(3,2))^2);
starting_index=2; #to kanw gia na elegxw ta 2 teleytaia psifia tou L ta alla einai 0
```

```
for i=4:n
   for j=i-2:i-1
     sum=0;
     for k=starting_index:j-1
       sum=sum+L(i,k)*L(j,k);
     end
     L(i,j)=(a1(i,j)-sum)/L(j,j);
   end
   starting_index=starting_index+1;
   sum=0;
   for j=i-2:i-1
     sum=L(i,j)^2+sum;
   end
   L(i,i)=sqrt(a1(i,i)-sum);
end
y=L\b1; %Diairo ton b1 me ton L
x=L'\y; %Diairo ton y me ton L antistrofo
disp('Ta pente arxika psifia')
for i=1:5
    x(i)
end
disp('Ta pente mesaia psifia')
for i=(n/2)-2:(n/2)+2
    x(i)
end
disp('Ta pente teleutaia psifia')
for i=n-4:n
    x(i)
end
tEnd = toc(tStart)
```

```
>> A1

Give size:100
Ta pente arxika psifia
ans = 0.9999999999999728
ans = 0.9999999999999211
ans = 0.9999999999998482
ans = 0.999999999999758
ans = 0.9999999999996536
Ta pente mesaia psifia
ans = 1.000000000001831
ans = 1.000000000002051
ans = 1.000000000002264
ans = 1.000000000002466
ans = 1.000000000002655
Ta pente teleutaia psifia
ans = 1.000000000000218
ans = 1.000000000000157
ans = 1.000000000000101
ans = 1.000000000000054
ans = 1.000000000000019
tEnd = 0.02124595642089844
>>
```

```
>> A1

Give size:1000
Ta pente arxika psifia
ans = 1.000000000001011
ans = 1.000000000003024
ans = 1.000000000006031
ans = 1.000000000010023
ans = 1.000000000014992
Ta pente mesaia psifia
ans = 0.9999999967056977
ans = 0.999999996693572
ans = 0.9999999966817181
ans = 0.9999999966701324
ans = 0.9999999966588111
Ta pente teleutaia psifia
ans = 0.999999999992652
ans = 0.9999999999950816
ans = 0.9999999999970369
ans = 0.9999999999985124
ans = 0.9999999999995021
tEnd = 0.1645100116729736
>>
```

```
>> A1

Give size:10000
Ta pente arxika psifia
ans = 1.000000000080978
ans = 1.00000000024288
ans = 1.000000000485654
ans = 1.000000000809246
ans = 1.000000001213603
Ta pente mesaia psifia
ans = 1.000179451578867
ans = 1.000179429928232
ans = 1.000179408247359
ans = 1.000179386536256
ans = 1.000179364794932
Ta pente teleutaia psifia
ans = 0.999999999862598
ans = 0.9999999999081504
ans = 0.9999999999447409
ans = 0.9999999999722955
ans = 0.9999999999907401
tEnd = 3.655979156494141
>>
```

```
n = input( 'Give size:');
format long g
tStart = tic;
a2=zeros(n,n);
for i=1:n;  %kyria diagwnios
  a2(i,i)=7;
endfor
for i=1:n-1;
  a2(i,i+1)=-4;
endfor
for i=2:n;
  a2(i,i-1)=-4;
endfor
for i=1:n-2;
  a2(i,i+2)=1;
endfor
for i=3:n;
  a2(i,i-2)=1;
endfor
b2=ones(n,1);
b2(1)=4;
b2(n)=4;
b2(2)=0;
b2(n-1)=0;
L=zeros(n);
L(1,1)=sqrt(a2(1,1));
L(2,1)=a2(2,1)/L(1,1);
L(2,2)=sqrt(a2(2,2)-L(2,1)^2);
L(3,1) = a2(3,1)/L(1,1);
L(3,2)=(a2(3,2)-L(3,1)*L(2,1))/L(2,2);
L(3,3)=sqrt(a2(3,3)-(L(3,1))^2-(L(3,2))^2);
starting_index=2; #to kanw gia na elegxw ta 2 teleytaia psifia tou L ta alla einai 0
```

```
for i=4:n
   for j=i-2:i-1
     sum=0;
     for k=starting_index:j-1
       sum=sum+L(i,k)*L(j,k);
     end
     L(i,j)=(a2(i,j)-sum)/L(j,j);
   end
   starting_index=starting_index+1;
   sum=0;
   for j=i-2:i-1
     sum=L(i,j)^2+sum;
   end
   L(i,i)=sqrt(a2(i,i)-sum);
end
y=L\b2; %Diairo ton b1 me ton L
x=L'\y; %Diairo ton y me ton L antistrofo
disp('Ta pente arxika psifia')
for i=1:5
    x(i)
end
disp('Ta pente mesaia psifia')
for i=(n/2)-2:(n/2)+2
    x(i)
end
disp('Ta pente teleutaia psifia')
for i=n-4:n
    x(i)
end
tEnd = toc(tStart)
```

```
>> a2_lin

Give size:100
Ta pente arxika psifia
ans = 0.9999999999999997
ans = 0.9999999999999992
ans = 0.9999999999999993
ans = 0.9999999999999991
ans = 0.9999999999999993
Ta pente mesaia psifia
ans = 1
ans = 1
ans = 1
ans = 1
ans = 1
Ta pente teleutaia psifia
ans = 1
ans = 1
ans = 1
ans = 1
ans = 1
tEnd = 0.02084612846374512
>>
```

```
>> a2_lin

Give size:1000
Ta pente arxika psifia
ans = 0.9999999999999997
ans = 0.9999999999999992
ans = 0.9999999999999993
ans = 0.9999999999999991
ans = 0.9999999999999993
Ta pente mesaia psifia
ans = 1
ans = 1
ans = 1
ans = 1
ans = 1
Ta pente teleutaia psifia
ans = 1
ans = 1
ans = 1
ans = 1
ans = 1
tEnd = 0.1715312004089355
>>
```

```
>> a2_lin

Give size:10000
Ta pente arxika psifia
ans = 0.9999999999999997
ans = 0.9999999999999992
ans = 0.9999999999999993
ans = 0.9999999999999991
ans = 0.9999999999999993
Ta pente mesaia psifia
ans = 1
ans = 1
ans = 1
ans = 1
ans = 1
Ta pente teleutaia psifia
ans = 1
ans = 1
ans = 1
ans = 1
ans = 1
tEnd = 3.741980075836182
>>
```