```
function [y] = utriangle(U,y,n)
for j=n:-1:2
    y(j)=y(j)/U(j,j);
    y(1:j-1)=y(1:j-1)-y(j)*U(1:j-1,j);
end
y(1)=y(1)/U(1,1);
end
```

```
function [v,b] = house(x)
n = length(x);
t = norm(x,"inf");
x = x./t;
c = x(2:n)'*x(2:n);
v=zeros(1,n);
v(2:n) = x(2:n);
if c == 0
    b=0;
else
    a=sqrt((x(1))^2 + c);
    if x(1)<=0
        v(1)=x(1)-a;
    else
        v(1) = -c/(x(1)+a);
    end
    b=2*v(1)*v(1)/(c+(v(1))^2);
    v=v/v(1);
end
end
```

```
function [A,d] = QR(A)
[m,n]=size(A);
d=zeros(1,n);
for j=1:n
    if j<m
        v=zeros(1,m-j+1);
        b=0;
        [v,b]=house(A(j:m,j));
        v=v';
        A(j:m,j:n)=(eye(m-j+1)-b*v*v')*A(j:m,j:n);
        d(j)=b;
        A(j+1:m,j)=v(2:m-j+1);
    end
end
end
```

```
function [Q] = culculateQ(A)
[m,n]=size(A);
d=zeros(1,n);
Q=eye(m);
[A,d]=QR(A);
for k=1:n
    H1=zeros(m-k+1);
    v=zeros(1,m-k+1);
    v(1)=1;
    v(2:m-k+1)=A(k+1:m,k);
    v=v';
    H1=eye(m-k+1)-d(k)*v*v';
    H=eye(m);
    H(k:m,k:m)=H1;
    Q=Q*H;
end
end
```

```
function [R] = culculateR(A)
[m,n]=size(A);
d=zeros(1,n);
[A,d]=QR(A);
R=zeros(n);
for j=1:n
    for i=1:j
        R(i,j)=A(i,j);
    end
end
end
```

```
t=[-1 -0.75 -0.5 0 0.25 0.5 0.75];
b=[1 0.8125 0.75 1 1.3125 1.75 2.3125]';
A=zeros(length(t),3);
for i=1:length(t)
    A(i,1)=(t(i))^2;
    A(i,2)=t(i);
    A(i,3)=1;
end
[m,n]=size(A);
Q=culculateQ(A);
Q1=zeros(m,n);
Q1=Q(1:m,1:n);
c1=Q1'*b;
R=zeros(n);
R=culculateR(A);
x=utriangle(R,c1,n)
```

```
x =

    1.0000
    1.0000
    1.0000
```

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