```
clear all
close all
clc
```

Variables

```
E1Glass=145e9;
E2Glass=10.5e9;
G12Glass=7.0e9;
v12Glass=0.28;
v21Glass=v12Glass*E2Glass/E1Glass;
h=[-25e-4, 0, 25e-4];
theta=[0,90];
m=cosd(theta(2));
n=sind(theta(2));
T=  [m^2, n^2, 2*m*n
    n^2, m^2, -2*m*n
    -m*n, m*n, m^2-n^2];
q=  [E1Glass/(1-v12Glass*v21Glass), v12Glass*E2Glass/(1-
v12Glass*v21Glass), 0
    v12Glass*E2Glass/(1-v12Glass*v21Glass), E2Glass/(1-
v12Glass*v21Glass), 0
    0, 0, G12Glass];
q1=q*T;
A=[0, 0, 0
    0, 0, 0
    0, 0 ,0];
B=[0, 0, 0
    0, 0, 0
    0, 0, 0];
D=[0, 0, 0
    0, 0, 0
    0, 0, 0];
for i=2:length(h)
    if i==2
        Q=q;
    end
    if i==3
        Q=q1;
    end
    for k=1:3
        for j=1:3
            Z=A;
            X=B;
            C=D;
            A(k,j)=Q(k,j)*(h(i)-h(i-1))+Z(k,j);
            B(k,j)=Q(k,j)*((h(i)^2)-(h(i-1)^2))+X(k,j);
            D(k,j)=Q(k,j)*((h(i)^3)-(h(i-1)^3))+C(k,j);
        end
    end
end
```

```
B=.5*B;
D=(1/3)*D;
A
B
D


A =

   1.0e+08 *

    3.7196    3.7196         0
    0.3379    0.3379         0
         0         0         0


B =

   1.0e+05 *

   -4.4647    4.4647         0
    0.2376   -0.2376         0
         0         0   -0.4375


D =

  774.9202  774.9202         0
   70.3997   70.3997         0
         0         0         0
```

7.38

```
clear all

E1Glass=24.5e9;
E2Glass=23.8e9;
G12Glass=4.3e9;
v12Glass=0.11;
v21Glass=v12Glass*E2Glass/E1Glass;

E1Balsa=65e6;
E2Balsa=65e6;
v12Balsa=0.4;
G12Balsa=E1Balsa/(2*1+v12Balsa);
v21Balsa=v12Balsa*E2Balsa/E1Balsa;


h=[(-26.52e-3), (-26.52e-3)+1.52e-3, (26.52e-3)-1.52e-3, (26.52e-3)];

q=  [E1Glass/(1-v12Glass*v21Glass), v12Glass*E2Glass/(1-
v12Glass*v21Glass), 0
```

```
    v12Glass*E2Glass/(1-v12Glass*v21Glass), E2Glass/(1-
v12Glass*v21Glass), 0
    0, 0, G12Glass];

q1=[E1Balsa/(1-v12Balsa*v21Balsa), v12Balsa*E2Balsa/(1-
v12Balsa*v21Balsa), 0
    v12Balsa*E2Balsa/(1-v12Balsa*v21Balsa), E2Balsa/(1-
v12Balsa*v21Balsa), 0
    0, 0, G12Balsa];

A=[0, 0, 0
    0, 0, 0
    0, 0 ,0];
B=[0, 0, 0
    0, 0, 0
    0, 0, 0];
D=[0, 0, 0
    0, 0, 0
    0, 0, 0];
for i=2:length(h)
    if i==2 || i==4
        Q=q;
    end
    if i==3
        Q=q1;
    end

    for k=1:3
        for j=1:3
            Z=A;
            X=B;
            C=D;
            A(k,j)=Q(k,j)*(h(i)-h(i-1))+Z(k,j);
            B(k,j)=Q(k,j)*((h(i)^2)-(h(i-1)^2))+X(k,j);
            D(k,j)=Q(k,j)*((h(i)^3)-(h(i-1)^3))+C(k,j);
        end
    end
end
B=.5*B;
D=(1/3)*D;
A
B
D


A =

   1.0e+07 *

    7.9235    0.9601         0
    0.9601    7.7082         0
         0         0    1.4426
```

```
B =

     0     0     0
     0     0     0
     0     0     0


D =

   1.0e+04 *

    5.0832    0.5668         0
    0.5668    4.9402         0
         0         0    0.8959
```

Published with MATLAB® R2017a