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Dept Chemical Engineering

Course Code: ENG 382

Solution

$$\begin{aligned}10m_1 - 2m_2 + m_3 &= 9 \\ -2m_1 + 10m_2 - 3m_3 &= 12 \\ -2m_1 - 5m_2 + 10m_3 &= 18\end{aligned}$$

$$\text{Initial } M_0 = [0 \ 0 \ 0]$$

$$m_1 = \frac{m_2}{5} - \frac{m_3}{10} + 0.9$$

$$m_2 = \frac{m_1}{5} + \frac{m_3}{5} + 1.2$$

$$m_3 = \frac{m_1}{5} + \frac{m_2}{2} + 1.8$$

$$m_1 = 0.2(0) - 0.1(0) + 0.9 = 0.9$$

$$m_2 = 0.2(0) + 0.2(0) + 1.2 = 1.2$$

$$m_3 = 0.2(0) + 0.5(0) + 1.8 = 1.8$$

$$m_1 = 0.2(1.2) - 0.1(1.8) + 0.9 = 0.96$$

$$m_2 = 0.2(0.9) + 0.2(1.8) + 1.2 = 1.74$$

$$m_3 = 0.2(0.9) + 0.5(1.2) + 1.8 = 2.58$$

$$m_1 = 0.2(1.74) - 0.1(2.58) + 0.9 = 0.79$$

$$m_2 = 0.2(0.96) + 0.2(2.58) + 1.2 = 1.908$$

$$m_3 = 0.2(0.96) + 0.5(1.74) + 1.8 = 2.862$$

$$m_1 = 0.2(1.908) - 0.1(2.862) + 0.9 = 0.9954$$

$$m_2 = 0.2(0.99) + 0.2(2.862) + 1.2 = 1.9704$$

$$m_3 = 0.2(0.99) + 0.5(1.908) + 1.8 = 2.959$$

Math Assignment 4

Editor - C:\Users\omozo\Documents\Math Assignment 4\jacobiass.m

newraphc.m X lagrangem X pivot.m X myjacobi.m X myjacobi1.m X Matrixmetho

```
1 function X = jacobiass(A,b,x0,tol)
2     A=[10 -2 1;-2 10 -2;-2 -5 10];
3     b=[9 12 18]';
4     x0=[0 0 0]';
5     maxi=100;
6     tol=0.00000001;
7     n=length(b);
8     for k=1:maxi
9         for i=1:n
10            X(i) = (b(i)-A(i,[1:i-1,i+1:n])*x0([1:i-1,i+1:n]))/A(i,i)
11        end
12        err=abs(norm(X'-x0));
13        relerr=err/(norm(X));
14        x0=X';
15        if (err<tol)|(relerr<tol)
16            break
17        end
18    end
19    X=x'
```

Command Window

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