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16/ENG05/010 Mechatronics Engineering
ENG 382 Assignment

Assignment 4

$10m_1 - 2m_2 + m_3 = 9$
$-2m_1 + 10m_2 - 2m_3 = 12$
$-2m_1 - 5m_2 + 10m_3 = 18$

~~$m_1 = 0.2m_2 - 0.1m_3 + 0.9$~~ $m_1 = 0.2m_2 - 0.1m_3 + 0.9$
$m_2 = 0.2m_1 + 0.2m_3 + 1.2$
$m_3 = 0.2m_1 + 0.5m_2 + 1.8$

at initial guess vector of $m_0 = [0; 0; 0]$

$m_1^0 = 0$ | $m_1^1 = 0.2(0) - 0.1(0) + 0.9 = 0.9$
$m_2^0 = 0$ | $m_2^1 = 0.2(0) + 0.2(0) + 1.2 = 1.2$
$m_3^0 = 0$ | $m_3^1 = 0.2(0) + 0.5(0) + 1.8 = 1.8$

$m_1^2 = 0.2(1.2) - 0.1(1.8) + 0.9 = 0.96$
$m_2^2 = 0.2(0.9) + 0.2(1.8) + 1.2 = 1.74$
$m_3^2 = 0.2(0.9) + 0.5(1.2) + 1.8 = 2.58$

$m_1^3 = 0.2(1.74) - 0.1(2.58) + 0.9 = 0.99$
$m_2^3 = 0.2(0.96) + 0.2(2.58) + 1.2 = 1.908$
$m_3^3 = 0.2(0.96) + 0.5(1.74) + 1.8 = 2.862$

MATLAB PROGRAM CODE

```
commandwindow
clear
clc
syms m
m1=0
m2=0
m3=0
for i=1:3
    iter(i+1)=i
    m1(i+1)=((0.2*m2(i))-(0.1*m3(i))+0.9)
    m2(i+1)=((0.2*m1(i))+(0.2*m3(i))+1.2)
    m3(i+1)=((0.2*m1(i))+(0.5*m2(i))+1.8)
end
tablo=[iter' m1' m2' m3']
```