```
%{
Writer: Akshay S Tharval
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Subject: Assignment Q5b
%}

clear all %clear stored variables
clc %clear the screen
close all %close all previously created plots


n = 15 % Given number of nodes

deltaPL= 101325/3/25400; % The value of DeltaP/L in terms of Pascal/
Micron

deltaY= 150/(n+1); % Calculating the value of Delta Y

u= 8.9*10^-4; % Viscosity of water at 25 Celcius in Pascal.Seconds

G = deltaY^2*deltaPL/u; %calculating G, which is basically a contains
 all the constants

% Considering the boundary condition

%Creating the sparse matrix using sparse function
D = sparse(1:n,1:n,2*ones(1,n),n,n);
E = sparse(2:n,1:n-1,-1*ones(1,n-1),n,n);
matV = E+D+E'

GMat(1:n)=G; %Creating a vector of G

Vel=inv(matV)*GMat' %Solving the system of equations

Vel = [0;Vel;0] %Because we consider the boundary condition, we need
 to put a zero row on the top and bottom of the output vector

N1= 0:n+1; %Creating an array of for plotting

plot(Vel,N1,'-g') % Creating velocity profile by plotting Velocity at
 each node


n =

    15


matV =

   (1,1)        2
```
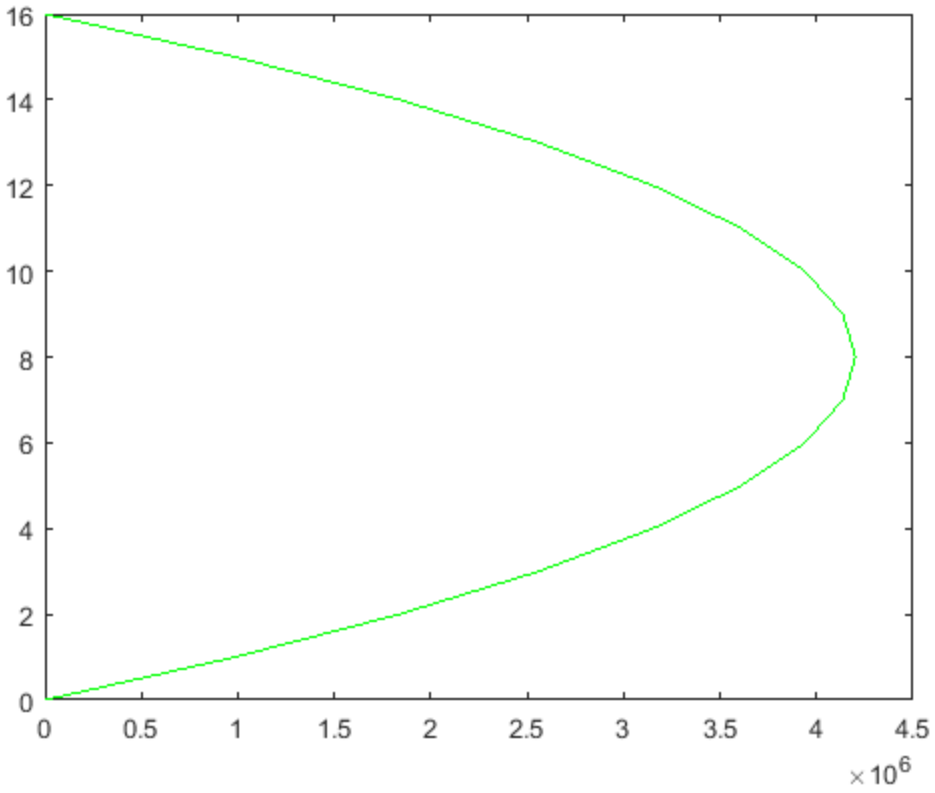

```
    (2,1)       -1
    (1,2)       -1
    (2,2)        2
    (3,2)       -1
    (2,3)       -1
    (3,3)        2
    (4,3)       -1
    (3,4)       -1
    (4,4)        2
    (5,4)       -1
    (4,5)       -1
    (5,5)        2
    (6,5)       -1
    (5,6)       -1
    (6,6)        2
    (7,6)       -1
    (6,7)       -1
    (7,7)        2
    (8,7)       -1
    (7,8)       -1
    (8,8)        2
    (9,8)       -1
    (8,9)       -1
    (9,9)        2
   (10,9)       -1
    (9,10)      -1
   (10,10)       2
   (11,10)      -1
   (10,11)      -1
   (11,11)       2
   (12,11)      -1
   (11,12)      -1
   (12,12)       2
   (13,12)      -1
   (12,13)      -1
   (13,13)       2
   (14,13)      -1
   (13,14)      -1
   (14,14)       2
   (15,14)      -1
   (14,15)      -1
   (15,15)       2


Vel =

   1.0e+06 *

    0.9849
    1.8384
    2.5606
    3.1516
    3.6112
    3.9394
```

```
    4.1364
    4.2021
    4.1364
    3.9394
    3.6112
    3.1516
    2.5606
    1.8384
    0.9849


Vel =

   1.0e+06 *

         0
    0.9849
    1.8384
    2.5606
    3.1516
    3.6112
    3.9394
    4.1364
    4.2021
    4.1364
    3.9394
    3.6112
    3.1516
    2.5606
    1.8384
    0.9849
         0
```



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