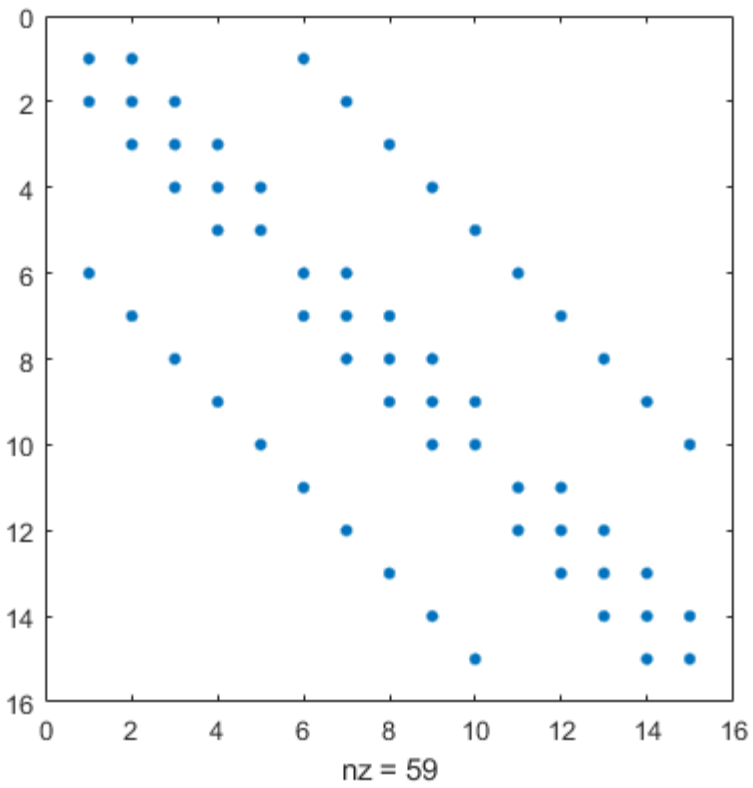
Contents

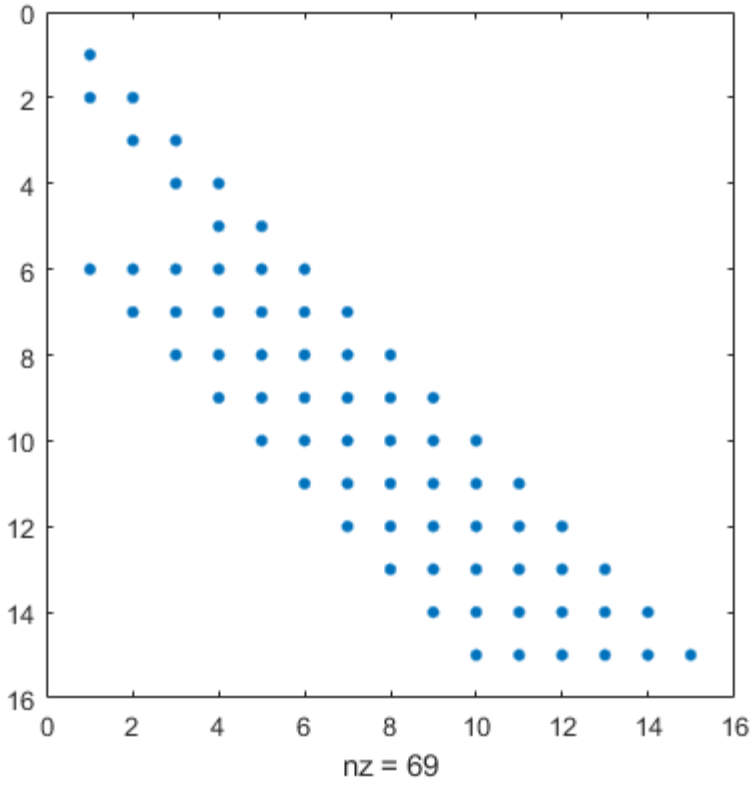
Part A

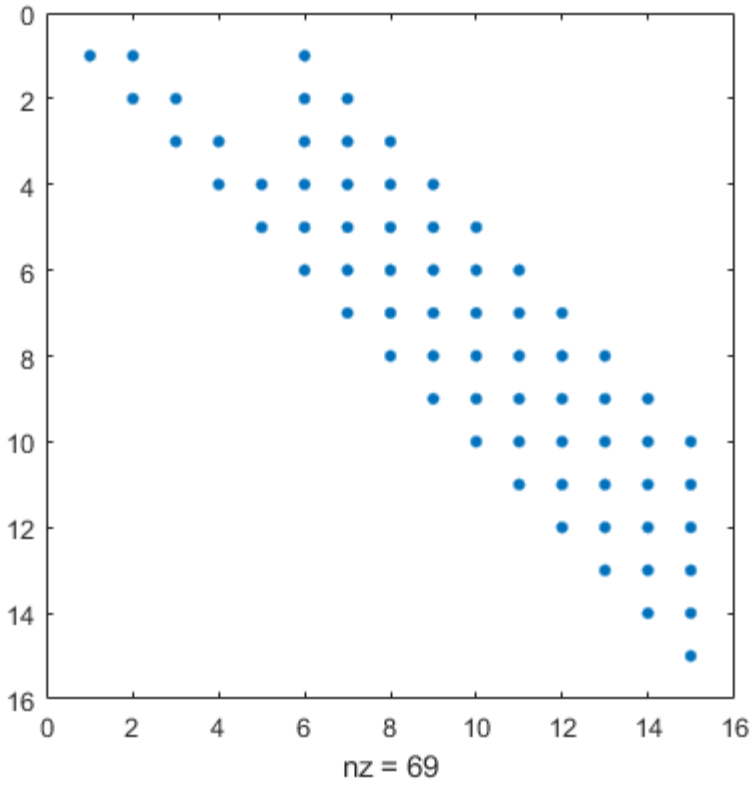
```
clc
clear all
close all

G = [4,-1,0,0,0,-1,0,0,0,0,0,0,0,0,0;
    -1,4,-1,0,0,0,-1,0,0,0,0,0,0,0,0;
    0,-1,4,-1,0,0,0,-1,0,0,0,0,0,0,0;
    0,0,-1,4,-1,0,0,0,-1,0,0,0,0,0,0;
    0,0,0,-1,4,0,0,0,0,-1,0,0,0,0,0;
    -1,0,0,0,0,4,-1,0,0,0,-1,0,0,0,0;
    0,-1,0,0,0,-1,4,-1,0,0,0,-1,0,0,0;
    0,0,-1,0,0,0,-1,4,-1,0,0,0,-1,0,0;
    0,0,0,-1,0,0,0,-1,4,-1,0,0,0,-1,0;
    0,0,0,0,-1,0,0,0,-1,4,0,0,0,0,-1;
    0,0,0,0,0,-1,0,0,0,0,4,-1,0,0,0;
    0,0,0,0,0,0,-1,0,0,0,-1,4,-1,0,0;
    0,0,0,0,0,0,0,-1,0,0,0,-1,4,-1,0;
    0,0,0,0,0,0,0,0,-1,0,0,0,-1,4,-1;
    0,0,0,0,0,0,0,0,0,-1,0,0,0,-1,4];

b = [12 0 0 0 0 12 0 0 0 0 12 0 0 0 0]';

f0 = figure('Name', 'Spy(G)');
t = title('Spy(G)'); %not sure why this isn't working
spy(G)

[L, U, P] = lu(G);

f1 = figure('Name', 'Spy(L)');
title('Spy(L)')
spy(L)

f2 = figure('Name', 'Spy(U)');
title('Spy(U)')
spy(U)

f3 = figure('Name', 'Spy(P)');
title('Spy(P)')
spy(P)

f5 = figure('Name', 'Subplot Comparison');
subplot(2, 2, 1);
spy(G)
subplot(2, 2, 2);
spy(L)
subplot(2, 2, 3);
spy(U)
subplot(2, 2, 4);
spy(P)

v = G\b
```

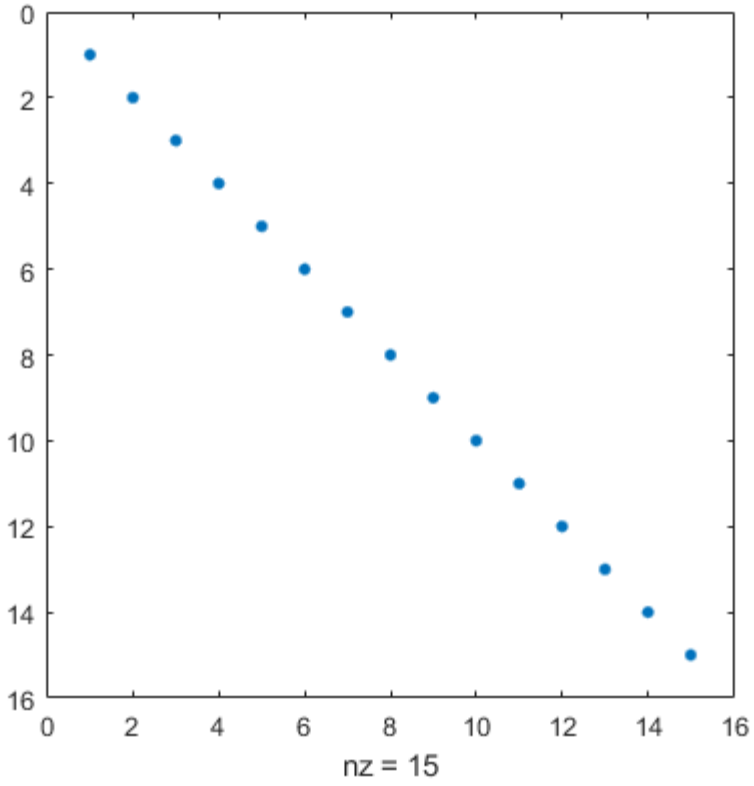
```
V_report = reshape(v, [5, 3]).'
```

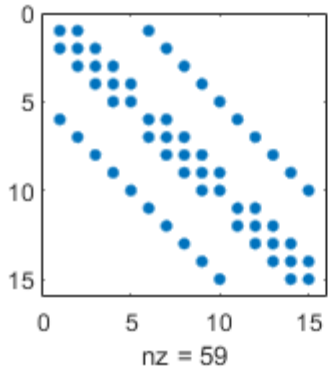
```
v =

    5.1832
    2.3544
    1.0869
    0.4910
    0.1894
    6.3784
    3.1473
    1.5022
    0.6877
    0.2666
    5.1832
    2.3544
    1.0869
    0.4910
    0.1894


V_report =

    5.1832    2.3544    1.0869    0.4910    0.1894
    6.3784    3.1473    1.5022    0.6877    0.2666
    5.1832    2.3544    1.0869    0.4910    0.1894
```

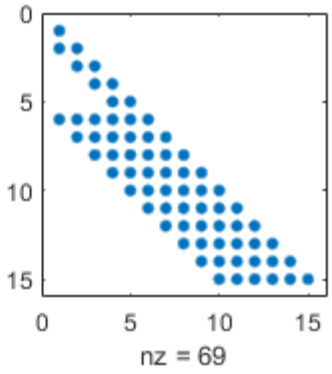


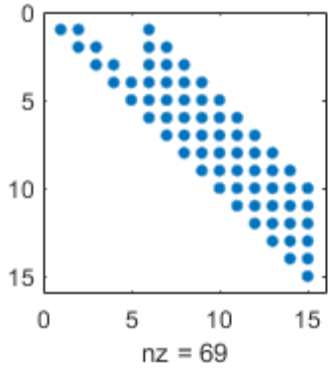

0
2
4
6
8
10
12
14
16
nz = 69

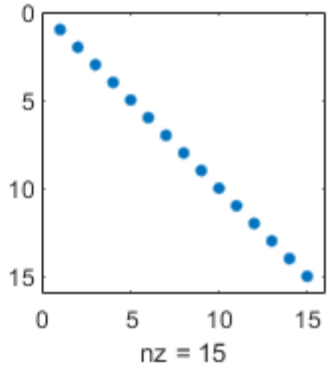

0
2
4
6
8
10
12
14
16
nz = 69











Part B

```
partB_G = [4,-1,0,0,0,-1,0,0,0,0,0,0,0,0,0;
    -1,4,-1,0,0,0,-1,0,0,0,0,0,0,0,0;
    0,-1,4,-1,0,0,0,-1,0,0,0,0,0,0,0;
```

```
    0,0,-1,4,-1,0,0,0,-1,0,0,0,0,0,0;
    0,0,0,-1,4,0,0,0,0,-1,0,0,0,0,0;
    -1,0,0,0,0,4,-1,0,0,0,-1,0,0,0,0;
    0,-1,0,0,0,-1,3,-1,0,0,0,0,0,0,0;
    0,0,-1,0,0,0,-1,4,-1,0,0,0,-1,0,0;
    0,0,0,-1,0,0,0,-1,3,-1,0,0,0,0,0;
    0,0,0,0,-1,0,0,0,-1,4,0,0,0,0,-1;
    0,0,0,0,0,-1,0,0,0,0,3,-1,0,0,0;
    0,0,0,0,0,0,0,0,0,0,-1,2,-1,0,0;
    0,0,0,0,0,0,0,-1,0,0,0,-1,3,-1,0;
    0,0,0,0,0,0,0,0,0,0,0,0,-1,2,-1;
    0,0,0,0,0,0,0,0,0,-1,0,0,0,-1,3];
b = [12 0 0 0 0 12 0 0 0 0 12 0 0 0 0]';

v_new = partB_G\b

V_report_new = reshape(v_new, [5, 3]).'
```

```
v_new =

    5.6746
    2.9785
    1.7014
    0.9116
    0.4171
    7.7199
    4.5380
    2.9156
    1.5280
    0.7567
    8.6669
    6.2809
    3.8949
    2.4883
    1.0817


V_report_new =

    5.6746    2.9785    1.7014    0.9116    0.4171
    7.7199    4.5380    2.9156    1.5280    0.7567
    8.6669    6.2809    3.8949    2.4883    1.0817
```

Published with MATLAB® R2018b