Lab6

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Problem 1

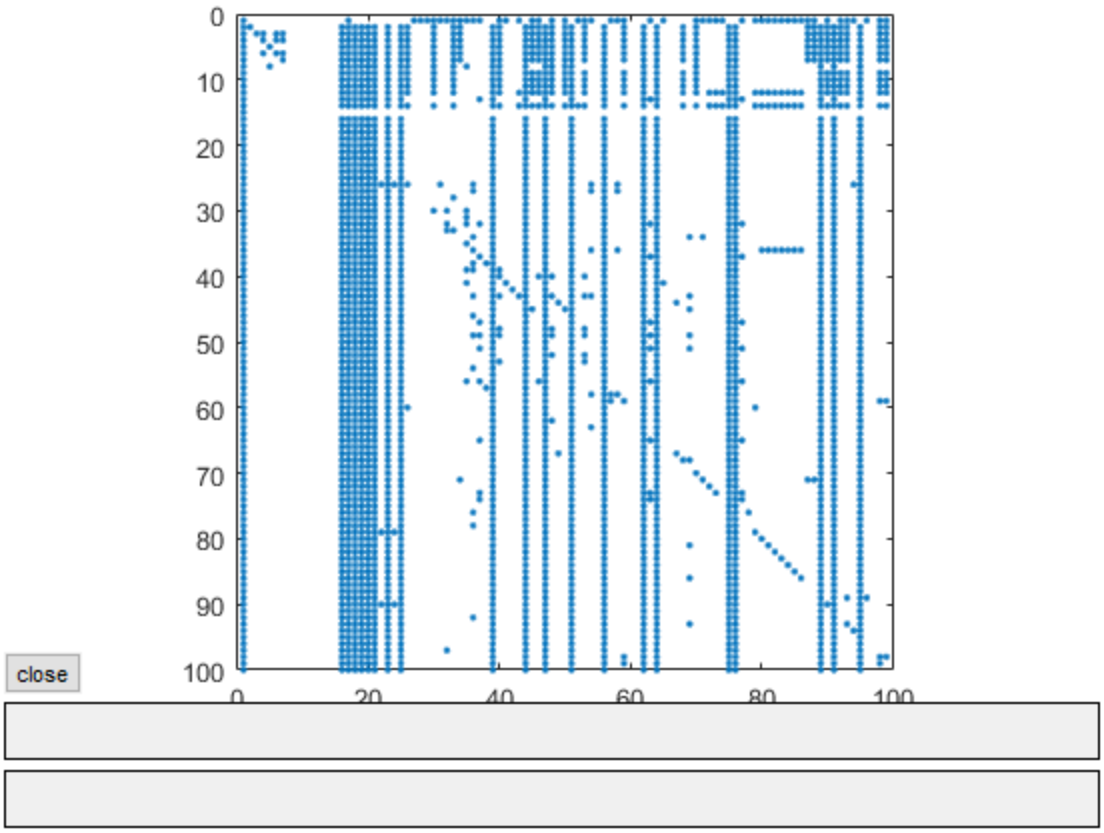
```
% a
%P1 = 1/3 p2
%P2 = 1/2 p5 + 1/2 p6
%P3 = 1/2 p1 + 1/3 p2
%P4 = 1/3 p3 + 1/2 p8
%P5 = 1/2 p1 + 1/3 p3
%P6 = 1/2 p4 + 1/2 p5 + p7
%P7 = 1/3 p2 + 1/2 p3 + 1/2 p8
%P8 = 1/2 p4 + 1/2 p6

% b

A = zeros(8,8);
A(1,2) = 1/3;
A(2,[5,6]) = [1/2, 1/2];
A(3,[1,2]) = [1/2,1/3];
A(4,[3,8]) = [1/3,1/2];
A(5,[1,3]) = [1/2,1/3];
A(6,[4,5,7]) = [1/2,1/2,1];
A(7,[2,3,8]) = [1/3,1/2,1/2];
A(8,[4,6]) = [1/2,1/2];

% c

p0 = [1/8;1/8;1/8;1/8;1/8;1/8;1/8;1/8];
N = 100;
P = p0;
for n = 1:N
    %bar(P);
    %pause;
    P = A * P;
end
P

% d

sort(P)
```

```
P =

    0.1532
    0.4649
    0.2289
    0.3550
    0.1511
    0.7896
    0.5459
    0.5657


ans =

    0.1511
    0.1532
    0.2289
    0.3550
    0.4649
    0.5459
    0.5657
    0.7896
```

Problem 2

```
%a
M = 100;
[w,L] = surfer('http://www.unh.edu',M);

%b
i = find(L == 1);
j = find(L == 0);
length(i) + length(j)

%c

A = zeros(M,M);
for j = 1:M    %Setting A's columns
    s = sum(L(:,j));
    if s == 0
        A(:,j) = ones(M,1)/M;
    else A(:,j) = L(:,j)/s;
    end
end

%d

alpha = 0.15;
B = (1-alpha)*A + alpha*ones(M,M)/M;    %Making B with alpha = 0.15

%e
```

```
for k = 1:M    %Checking that B's columns sum to 1
    s = sum(B(:,k),1);
    if abs(s - 1)/100 > eps
        fprintf('column %i does not add to 1\n',k);
    end
end

%f

p = zeros(M,1);
p(1) = 1;
N = 40;
for n = 1:N
    p = B * p;
end

[Q,I] = sort(p);
W = w;
for i = 1:length(I)
    W(i) = W(I(i));
end

for i = 1:10
    k = W{length(W) + 1 - i};
    l = Q(length(Q) + 1 - i)*100;
    fprintf('%02i. %-70s %%%07.4f\n',i,k,l);
end


ans =

       10000

01. http://www.unh.edu/vpfa
     %21.0605
02. http://www.unh.edu/academic-affairs
     %07.1871
03. http://www.unh.edu/sites/www.unh.edu/themes/unh_home/logo.png
     %05.6296
04. http://www.unh.edu/womens-commission
     %03.1594
05. http://www.unh.edu/glbt
     %03.1594
06. http://www.unh.edu/serve
     %02.5632
07. http://www.tnhdigital.com
     %02.3303
08. http://www.unh.edu/grad-catalog
     %02.1499
09. http://www.unh.edu/cspc
     %01.8750
10. http://www.unh.edu/president
     %01.4522
```



Problem 3

```
%It sounds like using this method to give a popularity quotient would
 give
%a fairly rough but useful estimate. It keeps in mind social circles
 and
%also has the teleportation matrix which keeps in mind random
 meetings.
%Although the main flaw would be that different people would have
 different
%teleportation percentages, but overall this would give a decent
 estimate.
%My answer says that google page rank is useful and you can see this
 in
%your everday life when you use google and the page you're looking for
 is
%in the top 3 links.
```

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