

```
clear all;
close all;
clc;
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%AUTHOR SPECIFIC DATA
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%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
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%NEWMAN, MARK
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```
%citations = 12012;
%references = 1843;
%cvector = [20108/2763, 13583/1679, 13727/1014, 2730/366, 3859/3222,
3278/1855, 2804/1873, 4811/1732, 10206/3630, 9769/664, 6620/1589,
1757/1271, 1129/1109, 611/349];
%rvector = [19480/183, 10487, 14735/1561, 11434, 13727/1014,
9769/664, 20108/2763, 13583/1679, 14143/4048, 4915/1580, 4270/466,
6822/823, 7490/1049, 3814/1075, 6837/459, 5821/505];
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%EINSTEIN, ALBERT
```

```
%citations = 4381;
%references = 0;
%cvector = [8836/3312, 2793/482, 3864/1314, 4654/1424, 12915/603,
11567/1296, 5532/752, 10443/569, 2165/594, 2077/442, 4673/1455,
3271/1019, 8643/1713, 3522/1347, 3465/2079, 3577/2241, 3017/1537,
5471/908, 4518/697, 6231/901, 6628/1521, 5276/1504, 1233/703,
14782/4812, 14777/3596, 5824/1622, 2935/561, 3737/766, 8462/2138,
3966/1294, 1801/1472, 2347/537, 1197/69, 1541/924, 6209/574,
4117/1091, 9108/2410, 2541/804, 8584/2852, 1703/69, 1091/709,
5197/2693];
```

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%SHANNON, CLAUDE
```

```
%citations = 225;
%references = 0;
%cvector = [5083/4842, 2528/1331, 3381/1463, 7101/3715, 417/365,
880/812, 1389/392, 4605/525, 1893/942, 1869/743, 5657/2204];
```

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%ERDOS, PAUL
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```
% citations = 2187;
% references = 544;
% cvector = [12012/1843, 13727/1014, 9769/664, 6797/2197, 4213/1254,
2264/357, 1804/510, 1588/404, 8462/4514, 822/484, 4202/2723, 1902/486,
7556/2567];
% rvector = [3397/2589, 1588/852, 300/144, 1798/1165, 1571/200,
267/12, 1122/608, 919/200, 3267/1106, 2586/1766, 4240/3099];
```

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%SHENKER, SCOTT
```

```
% citations=5970;
% references=2602;
% cvector=[3624/489, 2122/57, 3191/1296, 927/170, 955/559, 5548/3393,
488/18, 1893/1241, 1449/477, 488/509, 1019/139, 1053/2149, 2089/685,
8938/1876, 1116/757, 473/191, 1702/2151, 2042/879, 1413/1347,
3903/4241, 529/1078, 1598/1540, 1627/576, 2780/3929, 1002/886,
3027/4067, 1346/527, 1259/1036, 213/22, 1424/643, 2151/474, 1850/1021,
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302/42, 1705/1467, 2855/1925, 1089/954, 1352/531, 3093/1374,
1302/1212, 1266/963, 1149/671, 174/37, 1244/717, 4242/2723,
1044/981];
% rvector=[20108/2763, 13583/1679, 7184/463, 4318/203, 2563/22,
4120/59, 2499/39, 2760/54, 5755/286, 4674/1359, 2462/664, 3224/1520,
2047/200, 1860/447, 1470, 3413/373, 2045/128, 2658/1368, 1898/562];

%Hirsch, Jorge E
% citations=4674;
% references=1144;
% cvector=[3813/2508, 4353/1999, 5555/2013, 3074/1010, 2625/2649,
9184/5546, 4421/1861, 1714/472, 3704/1040, 1798/283, 1654/1356,
5883/2284, 3558/1241, 3770/1945, 2446/1957, 6482/4806, 1203/480,
3166/2995, 1304/216, 12970/3192, 2831/861, 6572/796, 1636/1976,
3402/797, 713/429, 3192/2093, 2954/1519, 5734/3090, 4301/2191,
540/647, 6612/1057, 2235/1870, 7334/1600, 1336/1142, 640/495,
6753/823, 1669/1404, 21353/651, 3528/1686, 5442/3259, 2094/1935,
1369/1689, 1877/1401, 1312/594, 3666/2096, 2053/1183, 4195/1512];
% rvector=[24415/318, 16794/157, 6010, 8259/3016, 3311/5, 3858/2438,
5585/347, 7681/2639, 2706/969, 7710/1139, 10148/3014, 9148/462,
07088/1227, 4992/700, 1226/3826, 4133/35, 1922, 10886/3094, 5348/2859,
2817/34, 2674, 2229/641, 1831/504];

%Pople, John A
% citations=37298;
% references=1412;
% cvector=[30553/2324, 21392/1079, 43050/2955, 4562/399, 11216/4656,
6106/3138, 3972/128, 7649/2077, 9506/7910, 2807/1082, 5110/7105,
7291/3058, 13386/2364, 2369/112, 7313/3112, 3408/1460, 12284/148,
4763/1405, 19451/3044, 2149/110, 2206/1989, 8638/3, 2883/245,
37298/1412, 20726/3379, 4038/2186, 4593/831, 11995/8698, 90184/3453,
6825/8998, 3555/2773, 3324/2798, 53628/520, 1543/102, 1199/83,
6125/7825, 6051/952, 1684/1257, 2246/1265, 15629/3361, 14866/4798,
2192/240];
% rvector=[39610/726, 21206/56, 16956/1329, 35667/77, 9041/1011, 8561,
10778/1872, 7038/72, 6354, 6349, 11226/745, 3591, 9482, 12133/1941,
4971/1366, 5343/291, 6220, 5262/440, 8008/130, 3219/401, 5024/440,
14524/5467];

%Toy 1
% citations=4;
% references=60;
% cvector=[3/75, 2/120, 1/200, 4/90];
% rvector=[12012/1843, 19480/183, 10487, 14735/1561, 11434,
13727/1014, 9769/664, 20108/2763, 13583/1679, 14143/4048, 4915/1580,
4270/466, 6822/823, 7490/1049, 3814/1075, 6837/459, 5821/505];

%Toy 2
% citations=4;
% references=80;
% cvector=[3/75, 2/120, 1/200, 4/90];

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% rvector=[12012/1843, 19480/183, 10487, 14735/1561, 11434,
13727/1014, 9769/664, 20108/2763, 13583/1679, 14143/4048, 4915/1580,
4270/466, 6822/823, 7490/1049, 3814/1075, 6837/459, 5821/505,
7649/2077, 9506/7910, 2807/1082, 5110/7105, 7291/3058, 13386/2364,
2369/112, 7313/3112, 3408/1460, 12284/148, 4763/1405, 19451/3044,
2149/110, 2206/1989];

%Toy3
% citations=10;
% references=60;
% cvector=[3/75, 2/120, 1/200, 4/90, 5/75, 6/120, 7/200, 5/90];
% rvector=[12012/1843, 19480/183, 10487, 14735/1561, 11434,
13727/1014, 9769/664, 20108/2763, 13583/1679, 14143/4048, 4915/1580,
4270/466, 6822/823, 7490/1049, 3814/1075, 6837/459, 5821/505];

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dim = citations+references+1;
A = zeros(dim, dim);
cintex_start = 2;
rindex_start = 2+citations;

%comment out this block for authors with zero citations
cvector_len = length(cvector);
A(2:cvector_len+1,1) = cvector';
A(cvector_len+2:citations+1,1) = 0.01*rand(citations-cvector_len,1);

%comment out this block for authors with zero references
rvector_len = length(rvector);
A(1,rindex_start:rindex_start+rvector_len-1) = rvector;
A(1,rindex_start+rvector_len:end) = min(rvector)*rand(1,dim-
(rindex_start+rvector_len)+1);

adj_matrix=A*A';
[Vh,Eh]=eigs(adj_matrix); %Initial hub vector Vh
adj_matrix=A'*A;
[Va,Ea]=eigs(adj_matrix); %Initial authority vector Va
h=(Vh(:,1)-min(Vh(:,1)))./(max(Vh(:,1))-min(Vh(:,1))); %Normalize
a=(Va(:,1)-min(Va(:,1)))./(max(Va(:,1))-min(Va(:,1))); %Normalize
h1=A*a; %Final hub vector
a1=A'*h; %Final authority vector
h1(1) %Hub index for 'S'
a1(1) %Authority index for 'S'

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