

Mocninna metoda pro vypocet dominantniho vlastniho cisla matice A

A =

2	1	1
1	3	2
1	1	2

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	1.000000e+00	1.000000e+00	1.000000e+00	
1	4.000000e+00	6.000000e+00	4.000000e+00	6.0000000
2	1.800000e+01	3.000000e+01	1.800000e+01	5.0000000
3	8.400000e+01	1.440000e+02	8.400000e+01	4.8000000
4	3.960000e+02	6.840000e+02	3.960000e+02	4.7500000
5	1.872000e+03	3.240000e+03	1.872000e+03	4.7368421
6	8.856000e+03	1.533600e+04	8.856000e+03	4.7333333

%%%

Mocninna metoda pro vypocet dominantniho vlastniho cisla matice A s normovanim vlastniho vektoru v kazde iteraci

A =

2	1	1
1	3	2
1	1	2

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	1.0000000	1.0000000	1.0000000	
1	4.0000000	6.0000000	4.0000000	6.0000000
2	0.6666667	1.0000000	0.6666667	5.0000000
3	3.0000000	5.0000000	3.0000000	5.0000000
4	0.6000000	1.0000000	0.6000000	4.8000000
5	2.8000000	4.8000000	2.8000000	4.8000000
6	0.5833333	1.0000000	0.5833333	4.7500000
7	2.7500000	4.7500000	2.7500000	4.7500000
8	0.5789474	1.0000000	0.5789474	4.7368421
9	2.7368421	4.7368421	2.7368421	4.7368421
10	0.5777778	1.0000000	0.5777778	4.7368421
11	2.7333333	4.7333333	2.7333333	4.7333333
12	0.5774648	1.0000000	0.5774648	4.7333333

C =

0.5774	0.5774	-0.0000
1.0000	-1.0000	-1.0000
0.5774	0.5774	1.0000

v =

4.7321	0	0
0	1.2679	0
0	0	1.0000

Metoda Rayleighova podilu pro vypocet dominantního vlastního čísla matice A

A =

2	1	1
1	3	2
1	1	2

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	1.000000e+00	1.000000e+00	1.000000e+00	
1	4.000000e+00	6.000000e+00	4.000000e+00	4.6666667
2	1.800000e+01	3.000000e+01	1.800000e+01	4.7647059
3	8.400000e+01	1.440000e+02	8.400000e+01	4.7441860
4	3.960000e+02	6.840000e+02	3.960000e+02	4.7355372

%%%

Metoda Rayleighova podilu pro vypocet dominantního vlastního čísla matice A s normovaním vlastního vektoru v každé iteraci

A =

2	1	1
1	3	2
1	1	2

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	1.0000000	1.0000000	1.0000000	
1	4.0000000	6.0000000	4.0000000	4.666667
2	0.6666667	1.0000000	0.6666667	
2	3.0000000	5.0000000	3.0000000	4.764706
3	0.6000000	1.0000000	0.6000000	
3	2.8000000	4.8000000	2.8000000	4.744186
4	0.5833333	1.0000000	0.5833333	
4	2.7500000	4.7500000	2.7500000	4.735537
4	0.5789474	1.0000000	0.5789474	

C =

0.5774	0.5774	-0.0000
1.0000	-1.0000	-1.0000
0.5774	0.5774	1.0000

v =

4.7321	0	0
0	1.2679	0
0	0	1.0000

Mocninna metoda pro vypocet dominantniho vlastniho cisla matice A

A =

2	0	0
0	1	0
0	-2	3

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	1.000000e+00	1.000000e+00	1.000000e+00	
1	2.000000e+00	1.000000e+00	1.000000e+00	2.0000000
2	4.000000e+00	1.000000e+00	1.000000e+00	2.0000000

C =

1	0	0
0	0	-1
0	1	-1

v =

2	0	0
0	3	0
0	0	1

vl. vektor pro $\lambda = 3$!
↑

ans =

1
0
-1

$$y^{(0)} = 1 \cdot \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} + 0 \cdot \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} + 1 \cdot \begin{bmatrix} 0 \\ -1 \\ -1 \end{bmatrix}$$

Mocninna metoda pro vypocet dominantniho vlastniho cisla matice A

A =

2	0	0
0	1	0
0	-2	3

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	1.000000e+00	1.000000e+00	1.000000e+01	
1	2.000000e+00	1.000000e+00	2.800000e+01	2.8000000
2	4.000000e+00	1.000000e+00	8.200000e+01	2.9285714
3	8.000000e+00	1.000000e+00	2.440000e+02	2.9756098
4	1.600000e+01	1.000000e+00	7.300000e+02	2.9918033
5	3.200000e+01	1.000000e+00	2.188000e+03	2.9972603

ans =

1
9
-1

$$y^{(0)} = 1 \cdot \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} + 9 \cdot \begin{bmatrix} 0 \\ 0 \\ 1 \end{bmatrix} - 1 \cdot \begin{bmatrix} 0 \\ -1 \\ -1 \end{bmatrix}$$

Mocninna metoda pro vypocet dominantniho vlastniho cisla matice A

A =

2	0	0
0	1	0
0	-2	3

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	0.000000e+00	1.000000e+00	1.000000e+00	
1	0.000000e+00	1.000000e+00	1.000000e+00	1.0000000
2	0.000000e+00	1.000000e+00	1.000000e+00	1.0000000

ans =

0
0
-1

$$y^{(0)} = 0 \cdot \begin{bmatrix} 1 \\ 0 \\ 0 \end{bmatrix} + 0 \cdot \begin{bmatrix} 0 \\ 1 \\ -2 \end{bmatrix} - 1 \cdot \begin{bmatrix} 0 \\ -1 \\ -1 \end{bmatrix}$$

\downarrow \downarrow \downarrow
 pl. vektor pl. vektor pl. vektor
 für $\lambda = 2$ für $\lambda = 3$ für $\lambda = 1$

Mocninna metoda pro vypocet dominantniho vlastniho cisla matice A

A =

3	3	0
0	4	2
0	0	1

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	1.000000e+00	1.000000e+00	1.000000e+00	
1	6.000000e+00	6.000000e+00	1.000000e+00	6.0000000
2	3.600000e+01	2.600000e+01	1.000000e+00	6.0000000

c =

1.0000	1.0000	1.0000
0	0.3333	-0.6667
0	0	1.0000

v =

3	0	0
0	4	0
0	0	1

$\lambda_1 = 3 \quad \lambda_2 = 4 \quad \lambda_3 = 1$

c \ y0 =

-5
5
1

$y^{(0)} = -5 v_1 + 5 v_2 + 1 v_3$!!!

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	1.000000e+00	0.000000e+00	1.000000e+00	
1	3.000000e+00	2.000000e+00	1.000000e+00	3.0000000
2	1.500000e+01	1.000000e+01	1.000000e+00	5.0000000
3	7.500000e+01	4.200000e+01	1.000000e+00	5.0000000

c \ y0 =

-2
2
1

$y^{(0)} = -2 v_1 + 2 v_2 + 1 v_3$!!!

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	3.000000e+00	2.000000e+00	1.000000e+00	
1	1.500000e+01	1.000000e+01	1.000000e+00	5.0000000
2	7.500000e+01	4.200000e+01	1.000000e+00	5.0000000

c \ y0 =

-6
8
1

$y^{(0)} = -6 v_1 + 8 v_2 + 1 v_3$!!!

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	1.000000e+00	1.000000e+00	1.000000e+00	
1	6.000000e+00	6.000000e+00	1.000000e+00	6.0000000
2	3.600000e+01	2.600000e+01	1.000000e+00	6.0000000
3	1.860000e+02	1.060000e+02	1.000000e+00	5.1666667
4	8.760000e+02	4.260000e+02	1.000000e+00	4.7096774
5	3.906000e+03	1.706000e+03	1.000000e+00	4.4589041
6	1.683600e+04	6.826000e+03	1.000000e+00	4.3102919
7	7.098600e+04	2.730600e+04	1.000000e+00	4.2163222
8	2.948760e+05	1.092260e+05	1.000000e+00	4.1540022
9	1.212306e+06	4.369060e+05	1.000000e+00	4.1112400
10	4.947636e+06	1.747626e+06	1.000000e+00	4.0811775
11	2.008579e+07	6.990506e+06	1.000000e+00	4.0596733

} seni linier!

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	1.000000e+00	0.000000e+00	1.000000e+00	
1	3.000000e+00	2.000000e+00	1.000000e+00	3.0000000
2	1.500000e+01	1.000000e+01	1.000000e+00	5.0000000
3	7.500000e+01	4.200000e+01	1.000000e+00	5.0000000
4	3.510000e+02	1.700000e+02	1.000000e+00	4.6800000
5	1.563000e+03	6.820000e+02	1.000000e+00	4.4529915
6	6.735000e+03	2.730000e+03	1.000000e+00	4.3090211
7	2.839500e+04	1.092200e+04	1.000000e+00	4.2160356
8	1.179510e+05	4.369000e+04	1.000000e+00	4.1539356
9	4.849230e+05	1.747620e+05	1.000000e+00	4.1112242
10	1.979055e+06	6.990500e+05	1.000000e+00	4.0811737
11	8.034315e+06	2.796202e+06	1.000000e+00	4.0596724

} seni linier!

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	3.000000e+00	2.000000e+00	1.000000e+00	
1	1.500000e+01	1.000000e+01	1.000000e+00	5.0000000
2	7.500000e+01	4.200000e+01	1.000000e+00	5.0000000
3	3.510000e+02	1.700000e+02	1.000000e+00	4.6800000
4	1.563000e+03	6.820000e+02	1.000000e+00	4.4529915
5	6.735000e+03	2.730000e+03	1.000000e+00	4.3090211
6	2.839500e+04	1.092200e+04	1.000000e+00	4.2160356
7	1.179510e+05	4.369000e+04	1.000000e+00	4.1539356
8	4.849230e+05	1.747620e+05	1.000000e+00	4.1112242
9	1.979055e+06	6.990500e+05	1.000000e+00	4.0811737
10	8.034315e+06	2.796202e+06	1.000000e+00	4.0596724
11	3.249155e+07	1.118481e+07	1.000000e+00	4.0440972

} seni linier!

k	y(1)_k	y(2)_k	y(3)_k	lambda_k
0	1.000000e+01	4.000000e+00	1.000000e+00	
1	4.200000e+01	1.800000e+01	1.000000e+00	4.2000000
2	1.800000e+02	7.400000e+01	1.000000e+00	4.2857143
3	7.620000e+02	2.980000e+02	1.000000e+00	4.2333333
4	3.180000e+03	1.194000e+03	1.000000e+00	4.1732283
5	1.312200e+04	4.778000e+03	1.000000e+00	4.1264151
6	5.370000e+04	1.911400e+04	1.000000e+00	4.0923640
7	2.184420e+05	7.645800e+04	1.000000e+00	4.0678212
8	8.847000e+05	3.058340e+05	1.000000e+00	4.0500453
9	3.571602e+06	1.223338e+06	1.000000e+00	4.0370770
10	1.438482e+07	4.893354e+06	1.000000e+00	4.0275540

$$c \setminus y_0 = \begin{matrix} -5 \\ 14 \\ 1 \end{matrix}$$