|  |  |
| --- | --- |
| **Матрица с хорошо отделимыми собственными числами** | **Матрица с плохо отделимыми собственными числами** |
| A =  133.0600 47.1842 -97.1706 3.1363 -12.2264  47.1842 80.0580 -86.8580 28.5415 -20.2757  -97.1706 -86.8580 117.2437 -26.9592 17.6774  3.1363 28.5415 -26.9592 62.3440 -37.9569  -12.2264 -20.2757 17.6774 -37.9569 58.2942 | A =  50.3669 59.5877 -17.9128 -1.6063 -41.2970  59.5877 157.8109 16.0785 -8.6205 -97.3206  -17.9128 16.0785 84.2250 -19.7719 -37.4839  -1.6063 -8.6205 -19.7719 61.4944 -47.2601  -41.2970 -97.3206 -37.4839 -47.2601 147.3027 |
| D =  280.0000 0 0 0 0  0 100.0000 0 0 0  0 0 50.0000 0 0  0 0 0 1.0000 0  0 0 0 0 20.0000 | D =  280.0000 0 0 0 0  0 100.2000 0 0 0  0 0 100.0000 0 0  0 0 0 20.0000 0  0 0 0 0 1.0000 |

**Матрица с хорошо отделимыми собственными числами.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| eps | Матрица после LR преобразования с собственными числами на диагонали | iter | Столбец с. ч. | Матрица из собственных векторов: |
| 0.0001 | 280.0000 144.5052 198.3491 13.1567 -12.2264  0.0000 99.9999 647.2021 34.9067 -10.7485  0.0000 0.0000 50.0001 1.3054 -4.4055  0.0000 0.0000 0.0000 20.0000 55.4566  -0.0000 -0.0000 -0.0000 0.0000 1.0000 | 21 | 280.0000  99.9999  50.0001  20.0000  1.0000 | 1.0000 -0.6260 0.4886 0.0293 0.0132  -0.0000 0.7798 -0.8699 -0.0839 0.0135  -0.0000 -0.0000 0.0672 -0.0433 0.0543  -0.0000 -0.0000 -0.0000 0.9951 -0.9445  -0.0000 -0.0000 -0.0000 -0.0000 0.3236 |
| 0.00001 | 280.0000 144.5052 198.3491 13.1567 -12.2264  0.0000 100.0000 647.2021 34.9067 -10.7485  0.0000 0.0000 50.0000 1.3054 -4.4055  0.0000 0.0000 0.0000 20.0000 55.4566  -0.0000 -0.0000 -0.0000 0.0000 1.0000 | 24 | 280.0000  100.0000  50.0000  20.0000  1.0000 | 1.0000 -0.6260 0.4886 0.0293 0.0132  -0.0000 0.7798 -0.8699 -0.0839 0.0135  -0.0000 -0.0000 0.0672 -0.0433 0.0543  -0.0000 -0.0000 -0.0000 0.9951 -0.9445  -0.0000 -0.0000 -0.0000 -0.0000 0.3236 |
| 0.000001 | 280.0000 144.5052 198.3491 13.1567 -12.2264  0.0000 100.0000 647.2021 34.9067 -10.7485  0.0000 0.0000 50.0000 1.3054 -4.4055  0.0000 0.0000 0.0000 20.0000 55.4566  -0.0000 -0.0000 -0.0000 0.0000 1.0000 | 28 | 280.0000  100.0000  50.0000  20.0000  1.0000 | 1.0000 -0.6260 0.4886 0.0293 0.0132  -0.0000 0.7798 -0.8699 -0.0839 0.0135  -0.0000 -0.0000 0.0672 -0.0433 0.0543  -0.0000 -0.0000 -0.0000 0.9951 -0.9445  -0.0000 -0.0000 -0.0000 -0.0000 0.3236 |
| 0.0000001 | 280.0000 144.5052 198.3491 13.1567 -12.2264  0.0000 100.0000 647.2021 34.9067 -10.7485  0.0000 0.0000 50.0000 1.3054 -4.4055  0.0000 0.0000 0.0000 20.0000 55.4566  -0.0000 -0.0000 -0.0000 0.0000 1.0000 | 31 | 280.0000  100.0000  50.0000  20.0000  1.0000 | 1.0000 -0.6260 0.4886 0.0293 0.0132  -0.0000 0.7798 -0.8699 -0.0839 0.0135  -0.0000 -0.0000 0.0672 -0.0433 0.0543  -0.0000 -0.0000 -0.0000 0.9951 -0.9445  -0.0000 -0.0000 -0.0000 -0.0000 0.3236 |

Значения полученные с помощью [V D] = eig(A)

V =

-1.0000 0.6260 0.4886 -0.0293 0.0132

-0.0000 -0.7798 -0.8699 0.0839 0.0135

-0.0000 -0.0000 0.0672 0.0433 0.0543

-0.0000 -0.0000 0.0000 -0.9951 -0.9445

0.0000 0.0000 -0.0000 -0.0000 0.3236

D =

280.0000 0 0 0 0

0 100.0000 0 0 0

0 0 50.0000 0 0

0 0 0 20.0000 0

0 0 0 0 1.0000

**Матрица с плохо отделимыми собственными числами.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| eps | Матрица после LR преобразования с собственными числами на диагонали | iter | Столбец с. ч. | Матрица из собственных векторов: |
| 0.00001 | 280.0000 71.2845 411.4792 44.6291 -41.2970  0.0000 100.1949 -0.5804 -6.5862 1.6203  0.0000 -0.0017 100.0051 8.4779 -18.4192  0.0000 0.0000 0.0000 20.0000 131.1514  0 .0000 0.0000 0.0000 0.0000 1.0000 | 931 | 280.0000  100.1949  100.0051  20.0000  1.0000 | 1.0000 0.3685 -0.7359 -0.0260 0.0321  -0.0000 -0.9296 0.6436 0.0806 -0.0668  -0.0000 -0.0000 0.2104 -0.1050 0.1104  -0.0000 -0.0000 -0.0000 0.9909 -0.9809  -0.0000 -0.0000 -0.0000 -0.0000 0.1421 |
| 0.000001 | 280.0000 68.0031 411.4792 44.6291 -41.2970  0.0000 100.1995 -0.5804 -6.5862 1.6203  0.0000 -0.0002 100.0005 8.4253 -18.4063  0.0000 0.0000 0.0000 20.0000 131.1514  0 .0000 0.0000 0.0000 0.0000 1.0000 | 2107 | 280.0000  100.1995  100.0005  20.0000  1.0000 | 1.0000 0.3538 -0.7396 -0.0260 0.0321  -0.0000 -0.9353 0.6367 0.0806 -0.0668  -0.0000 -0.0000 0.2183 -0.1044 0.1099  -0.0000 -0.0000 -0.0000 0.9909 -0.9809  -0.0000 -0.0000 -0.0000 -0.0000 0.1421 |
| 0.0000001 | 280.0000 67.6833 411.4792 44.6291 -41.2970  0.0000 100.2000 -0.5804 -6.5862 1.6203  0.0000 -0.0000 100.0000 8.4202 -18.4050  0.0000 0.0000 0.0000 20.0000 131.1514  0 .0000 0.0000 0.0000 0.0000 1.0000 | 3262 | 280.0000  100.2000  100.0000  20.0000  1.0000 | 1.0000 0.3523 -0.7399 -0.0260 0.0321  -0.0000 -0.9359 0.6360 0.0806 -0.0668  -0.0000 -0.0000 0.2191 -0.1043 0.1099  -0.0000 -0.0000 -0.0000 0.9909 -0.9809  -0.0000 -0.0000 -0.0000 -0.0000 0.1421 |
| 0.00000001 | 280.0000 67.6515 411.4792 44.6291 -41.2970  0.0000 100.2000 -0.5804 -6.5862 1.6203  0.0000 -0.0000 100.0000 8.4197 -18.4049  0.0000 0.0000 0.0000 20.0000 131.1514  0 .0000 0.0000 0.0000 0.0000 1.0000 | 4415 | 280.0000  100.2000  100.0000  20.0000  1.0000 | 1.0000 0.3522 -0.7400 -0.0260 0.0321  -0.0000 -0.9359 0.6360 0.0806 -0.0668  -0.0000 -0.0000 0.2191 -0.1043 0.1098  -0.0000 -0.0000 -0.0000 0.9909 -0.9809  -0.0000 -0.0000 -0.0000 -0.0000 0.1421 |

Значения полученные с помощью [V D] = eig(A)

V =

1.0000 -0.3521 -0.7400 -0.0260 0.0321

0.0000 0.9359 0.6360 0.0806 -0.0668

0.0000 -0.0000 0.2191 -0.1043 0.1098

0.0000 0.0000 0.0000 0.9909 -0.9809

0 .0000 0.0000 0.0000 0.0000 0.1421

D =

280.0000 0 0 0 0

0 100.2000 0 0 0

0 0 100.0000 0 0

0 0 0 20.0000 0

0 0 0 0 1.0000