

Ядро оператора увеличения нечеткости

Задано ядро K оператора увеличения нечеткости Φ и универсальное множество $E = \{1, 2, 3, 4\}$. Определить результат действия этого оператора на нечеткое множество A .

Круглов В.В., Дли М.И., Голунов Р.Ю. Нечеткая логика и искусственные нейронные сети.– М.: Издательство Физико-математической литературы, 2001

Задача i-20.1.

2

$$A = 0.3/1 + 0.1/2 + 0.2/3 + 0.9/4;$$
$$K(1) = 0.3/1 + 0.6/2 + 0.2/3 + 0.8/4$$
$$K(2) = 0.1/3 + 0.1/4$$
$$K(3) = 0.1/1 + 0.2/4$$
$$K(4) = 0.2/1 + 0.5/2 + 0.1/3 + 0.7/4$$

Задача i-20.2.

2

$$A = 0.2/1 + 0.4/2 + 0.1/3 + 0.7/4;$$
$$K(1) = 0.1/1 + 0.1/2 + 0.7/4$$
$$K(2) = 0.2/1 + 0.5/2 + 0.2/3 + 0.7/4$$
$$K(3) = 0.1/1 + 0.1/2 + 0.2/4$$
$$K(4) = 0.1/1 + 0.2/4$$

Задача i-20.3.

2

$$A = 0.4/1 + 0.8/2 + 0.1/3 + 0.9/4;$$
$$K(1) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$
$$K(2) = 0.1/4$$
$$K(3) = 0.3/1 + 0.4/2 + 0.2/3 + 0.3/4$$
$$K(4) = 0.2/1 + 0.6/2 + 0.1/3 + 0.7/4$$

Задача i-20.4.

2

$$A = 0.4/1 + 0.1/2 + 0.9/3 + 0.5/4;$$
$$K(1) = 0.2/2 + 0.6/4$$
$$K(2) = 0.3/1 + 0.5/2 + 0.1/3 + 0.8/4$$
$$K(3) = 0.3/1 + 0.4/2 + 0.2/3 + 0.3/4$$
$$K(4) = 0.1/1 + 0.1/2 + 0.7/4$$

Задача i-20.5.

2

$$A = 0.7/1 + 0.3/2 + 0.8/3 + 0.4/4;$$
$$K(1) = 0.2/2 + 0.1/3 + 0.6/4$$
$$K(2) = 0.3/1 + 0.5/2 + 0.2/3 + 0.3/4$$
$$K(3) = 0.2/1 + 0.5/2 + 0.2/3 + 0.7/4$$
$$K(4) = 0.1/1 + 0.2/4$$

Задача i-20.6.

2

$$A = 0.1/1 + 0.2/2 + 0.1/3 + 0.8/4;$$
$$K(1) = 0.3/1 + 0.5/2 + 0.2/3 + 0.8/4$$
$$K(2) = 0.1/1 + 0.1/2 + 0.2/4$$
$$K(3) = 0.1/4$$
$$K(4) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$

Задача i-20.7.

2

$$A = 1/1 + 1/2 + 0.9/3 + 0.7/4;$$
$$K(1) = 0.1/2 + 0.6/4$$
$$K(2) = 0.1/1 + 0.1/2 + 0.1/3 + 0.2/4$$
$$K(3) = 0.3/1 + 0.4/2 + 0.1/3 + 0.3/4$$
$$K(4) = 0.2/1 + 0.6/2 + 0.2/3 + 0.7/4$$

Задача i-20.8.

2

$$A = 0.5/1 + 0.2/2 + 0.3/3 + 0.5/4;$$
$$K(1) = 0.2/1 + 0.4/2 + 0.2/3 + 0.2/4$$
$$K(2) = 0.1/2 + 0.1/4$$
$$K(3) = 0.1/3 + 0.1/4$$
$$K(4) = 0.1/2 + 0.6/4$$

Задача i-20.9.

2

$$A = 0.7/1 + 0.8/2 + 0.4/3 + 0.5/4;$$
$$K(1) = 0.3/1 + 0.5/2 + 0.2/3 + 0.8/4$$
$$K(2) = 0.2/1 + 0.5/2 + 0.2/3 + 0.7/4$$
$$K(3) = 0.1/3 + 0.1/4$$
$$K(4) = 0.2/1 + 0.6/2 + 0.1/3 + 0.7/4$$

Задача i-20.10.

2

$$A = 0.1/1 + 0.1/2 + 0.1/3 + 0.9/4;$$
$$K(1) = 0.1/2 + 0.1/3 + 0.1/4$$
$$K(2) = 0.1/2 + 0.6/4$$
$$K(3) = 0.1/1 + 0.2/4$$
$$K(4) = 0.1/2 + 0.6/4$$

Задача i-20.11.

2

$$A = 0.2/1 + 0.7/2 + 1/3 + 1/4;$$
$$K(1) = 0.3/1 + 0.6/2 + 0.1/3 + 0.8/4$$
$$K(2) = 0.3/1 + 0.6/2 + 0.2/3 + 0.8/4$$
$$K(3) = 0.2/1 + 0.5/2 + 0.1/3 + 0.2/4$$
$$K(4) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$

Задача i-20.13.

2

$$A = 0.2/1 + 0.9/2 + 0.1/3 + 0.1/4;$$
$$K(1) = 0.2/1 + 0.6/2 + 0.1/3 + 0.7/4$$
$$K(2) = 0.2/1 + 0.5/2 + 0.2/3 + 0.7/4$$
$$K(3) = 0.1/2 + 0.6/4$$
$$K(4) = 0.1/1 + 0.1/2 + 0.2/4$$

Задача i-20.15.

2

$$A = 1/1 + 0.9/2 + 0.4/3 + 0.4/4;$$
$$K(1) = 0.2/1 + 0.5/2 + 0.1/3 + 0.2/4$$
$$K(2) = 0.1/1 + 0.1/2 + 0.1/3 + 0.7/4$$
$$K(3) = 0.2/1 + 0.5/2 + 0.1/3 + 0.7/4$$
$$K(4) = 0.1/1 + 0.1/2 + 0.1/3 + 0.2/4$$

Задача i-20.17.

2

$$A = 0.4/1 + 0.2/2 + 0.9/3 + 0.6/4;$$
$$K(1) = 0.1/2 + 0.6/4$$
$$K(2) = 0.3/1 + 0.6/2 + 0.1/3 + 0.8/4$$
$$K(3) = 0.2/1 + 0.4/2 + 0.2/3 + 0.2/4$$
$$K(4) = 0.1/2 + 0.6/4$$

Задача i-20.19.

2

$$A = 0.6/1 + 0.7/2 + 0.6/3 + 0.5/4;$$
$$K(1) = 0.1/1 + 0.2/2 + 0.7/4$$
$$K(2) = 0.1/1 + 0.2/2 + 0.1/3 + 0.7/4$$
$$K(3) = 0.2/2 + 0.1/3 + 0.6/4$$
$$K(4) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$

Задача i-20.21.

2

$$A = 0.8/1 + 0.5/2 + 1/3 + 1/4;$$
$$K(1) = 0.1/2 + 0.1/4$$
$$K(2) = 0.3/1 + 0.4/2 + 0.1/3 + 0.3/4$$
$$K(3) = 0.1/1 + 0.1/2 + 0.2/4$$
$$K(4) = 0.2/1 + 0.4/2 + 0.2/3 + 0.2/4$$

Задача i-20.12.

2

$$A = 0.3/1 + 0.6/2 + 0.7/3 + 0.8/4;$$
$$K(1) = 0.1/1 + 0.1/2 + 0.1/3 + 0.7/4$$
$$K(2) = 0.2/1 + 0.6/2 + 0.2/3 + 0.7/4$$
$$K(3) = 0.3/1 + 0.5/2 + 0.1/3 + 0.3/4$$
$$K(4) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$

Задача i-20.14.

2

$$A = 0.1/1 + 0.4/2 + 0.6/3 + 1/4;$$
$$K(1) = 0.1/3 + 0.1/4$$
$$K(2) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$
$$K(3) = 0.3/1 + 0.6/2 + 0.1/3 + 0.8/4$$
$$K(4) = 0.3/1 + 0.5/2 + 0.1/3 + 0.8/4$$

Задача i-20.16.

2

$$A = 0.4/1 + 0.4/2 + 0.5/3 + 0.7/4;$$
$$K(1) = 0.3/1 + 0.5/2 + 0.1/3 + 0.8/4$$
$$K(2) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$
$$K(3) = 0.2/1 + 0.6/2 + 0.2/3 + 0.7/4$$
$$K(4) = 0.2/1 + 0.5/2 + 0.1/3 + 0.7/4$$

Задача i-20.18.

2

$$A = 0.8/1 + 0.5/2 + 0.1/3 + 0.5/4;$$
$$K(1) = 0.1/1 + 0.2/2 + 0.7/4$$
$$K(2) = 0.3/1 + 0.4/2 + 0.1/3 + 0.3/4$$
$$K(3) = 0.1/1 + 0.2/2 + 0.7/4$$
$$K(4) = 0.1/2 + 0.1/3 + 0.6/4$$

Задача i-20.20.

2

$$A = 0.5/1 + 0.6/2 + 0.6/3 + 0.3/4;$$
$$K(1) = 0.1/1 + 0.1/2 + 0.1/3 + 0.7/4$$
$$K(2) = 0.3/1 + 0.6/2 + 0.1/3 + 0.8/4$$
$$K(3) = 0.2/1 + 0.5/2 + 0.2/3 + 0.2/4$$
$$K(4) = 0.1/1 + 0.1/2 + 0.7/4$$

Задача i-20.22.

2

$$A = 1/1 + 0.4/2 + 1/3 + 0.5/4;$$
$$K(1) = 0.2/1 + 0.5/2 + 0.1/3 + 0.7/4$$
$$K(2) = 0.2/1 + 0.4/2 + 0.2/3 + 0.2/4$$
$$K(3) = 0.1/2 + 0.1/4$$
$$K(4) = 0.1/1 + 0.1/2 + 0.1/3 + 0.7/4$$

Задача i-20.23.

2

$$A = 0.1/1 + 0.2/2 + 0.1/3 + 0.4/4;$$
$$K(1) = 0.3/1 + 0.5/2 + 0.2/3 + 0.8/4$$
$$K(2) = 0.3/1 + 0.5/2 + 0.1/3 + 0.3/4$$
$$K(3) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$
$$K(4) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$

Задача i-20.25.

2

$$A = 0.9/1 + 0.8/2 + 0.5/3 + 0.4/4;$$
$$K(1) = 0.2/1 + 0.5/2 + 0.2/3 + 0.7/4$$
$$K(2) = 0.3/1 + 0.5/2 + 0.1/3 + 0.8/4$$
$$K(3) = 0.1/2 + 0.6/4$$
$$K(4) = 0.2/1 + 0.5/2 + 0.2/3 + 0.2/4$$

Задача i-20.27.

2

$$A = 0.5/1 + 0.8/2 + 0.6/3 + 0.7/4;$$
$$K(1) = 0.2/1 + 0.5/2 + 0.2/3 + 0.7/4$$
$$K(2) = 0.3/1 + 0.5/2 + 0.1/3 + 0.8/4$$
$$K(3) = 0.1/1 + 0.1/3 + 0.2/4$$
$$K(4) = 0.2/1 + 0.6/2 + 0.1/3 + 0.7/4$$

Задача i-20.29.

2

$$A = 0.1/1 + 0.9/2 + 0.5/3 + 0.8/4;$$
$$K(1) = 0.2/1 + 0.6/2 + 0.2/3 + 0.7/4$$
$$K(2) = 0.1/2 + 0.6/4$$
$$K(3) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$
$$K(4) = 0.1/1 + 0.2/2 + 0.7/4$$

Задача i-20.31.

2

$$A = 0.9/1 + 0.9/2 + 0.5/3 + 0.4/4;$$
$$K(1) = 0.2/1 + 0.5/2 + 0.2/3 + 0.2/4$$
$$K(2) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$
$$K(3) = 0.3/1 + 0.4/2 + 0.1/3 + 0.3/4$$
$$K(4) = 0.2/1 + 0.6/2 + 0.2/3 + 0.7/4$$

Задача i-20.33.

2

$$A = 0.9/1 + 0.6/2 + 0.9/3 + 0.5/4;$$
$$K(1) = 0.2/1 + 0.4/2 + 0.2/3 + 0.2/4$$
$$K(2) = 0.1/1 + 0.2/2 + 0.7/4$$
$$K(3) = 0.3/1 + 0.6/2 + 0.1/3 + 0.8/4$$
$$K(4) = 0.2/1 + 0.4/2 + 0.2/3 + 0.2/4$$

Задача i-20.24.

2

$$A = 0.7/1 + 0.2/2 + 0.6/3 + 0.6/4;$$
$$K(1) = 0.1/1 + 0.1/2 + 0.1/3 + 0.7/4$$
$$K(2) = 0.3/1 + 0.6/2 + 0.2/3 + 0.8/4$$
$$K(3) = 0.2/1 + 0.4/2 + 0.2/3 + 0.2/4$$
$$K(4) = 0.1/2 + 0.6/4$$

Задача i-20.26.

2

$$A = 0.5/1 + 0.9/2 + 0.2/3 + 0.1/4;$$
$$K(1) = 0.1/2 + 0.1/3 + 0.1/4$$
$$K(2) = 0.1/1 + 0.2/4$$
$$K(3) = 0.3/1 + 0.5/2 + 0.2/3 + 0.8/4$$
$$K(4) = 0.2/1 + 0.6/2 + 0.1/3 + 0.7/4$$

Задача i-20.28.

2

$$A = 0.5/1 + 0.8/2 + 0.4/3 + 0.7/4;$$
$$K(1) = 0.1/3 + 0.1/4$$
$$K(2) = 0.2/1 + 0.4/2 + 0.1/3 + 0.2/4$$
$$K(3) = 0.1/1 + 0.1/3 + 0.2/4$$
$$K(4) = 0.3/1 + 0.6/2 + 0.1/3 + 0.8/4$$

Задача i-20.30.

2

$$A = 0.1/1 + 0.4/2 + 0.6/3 + 0.6/4;$$
$$K(1) = 0.3/1 + 0.4/2 + 0.2/3 + 0.3/4$$
$$K(2) = 0.1/4$$
$$K(3) = 0.1/2 + 0.1/4$$
$$K(4) = 0.3/1 + 0.5/2 + 0.1/3 + 0.8/4$$

Задача i-20.32.

2

$$A = 0.4/1 + 0.4/2 + 0.3/3 + 0.6/4;$$
$$K(1) = 0.3/1 + 0.4/2 + 0.1/3 + 0.3/4$$
$$K(2) = 0.1/1 + 0.2/4$$
$$K(3) = 0.2/2 + 0.1/3 + 0.6/4$$
$$K(4) = 0.1/1 + 0.2/4$$

Задача i-20.34.

2

$$A = 0.1/1 + 0.9/2 + 0.4/3 + 0.4/4;$$
$$K(1) = 0.1/2 + 0.1/3 + 0.1/4$$
$$K(2) = 0.3/1 + 0.4/2 + 0.1/3 + 0.3/4$$
$$K(3) = 0.3/1 + 0.5/2 + 0.1/3 + 0.8/4$$
$$K(4) = 0.1/1 + 0.2/2 + 0.7/4$$

i-20 Ответы.**Ядро оператора увеличения нечеткости**

13.12.2012

№	$\Phi(A, K)$
1	0.18/1+ 0.45/2+ 0.09/3+ 0.63/4
2	0.08/1+ 0.2/2+ 0.08/3+ 0.28/4
3	0.18/1+ 0.54/2+ 0.09/3+ 0.63/4
4	0.27/1+ 0.36/2+ 0.18/3+ 0.35/4
5	0.16/1+ 0.4/2+ 0.16/3+ 0.56/4
6	0.16/1+ 0.32/2+ 0.08/3+ 0.16/4
7	0.27/1+ 0.42/2+ 0.14/3+ 0.6/4
8	0.1/1+ 0.2/2+ 0.1/3+ 0.3/4
9	0.21/1+ 0.4/2+ 0.16/3+ 0.56/4
10	0.01/1+ 0.09/2+ 0.01/3+ 0.54/4
11	0.21/1+ 0.5/2+ 0.14/3+ 0.56/4
12	0.21/1+ 0.36/2+ 0.12/3+ 0.42/4
13	0.18/1+ 0.45/2+ 0.18/3+ 0.63/4
14	0.3/1+ 0.5/2+ 0.1/3+ 0.8/4
15	0.2/1+ 0.5/2+ 0.1/3+ 0.63/4
16	0.14/1+ 0.35/2+ 0.1/3+ 0.49/4
17	0.18/1+ 0.36/2+ 0.18/3+ 0.36/4
18	0.15/1+ 0.2/2+ 0.05/3+ 0.56/4
19	0.1/1+ 0.2/2+ 0.07/3+ 0.49/4
20	0.18/1+ 0.36/2+ 0.12/3+ 0.48/4
21	0.2/1+ 0.4/2+ 0.2/3+ 0.2/4
22	0.2/1+ 0.5/2+ 0.1/3+ 0.7/4
23	0.08/1+ 0.16/2+ 0.04/3+ 0.08/4
24	0.12/1+ 0.24/2+ 0.12/3+ 0.49/4
25	0.24/1+ 0.45/2+ 0.18/3+ 0.64/4
26	0.09/1+ 0.1/2+ 0.05/3+ 0.18/4
27	0.24/1+ 0.42/2+ 0.1/3+ 0.64/4
28	0.21/1+ 0.42/2+ 0.08/3+ 0.56/4
29	0.1/1+ 0.2/2+ 0.05/3+ 0.56/4
30	0.18/1+ 0.3/2+ 0.06/3+ 0.48/4
31	0.18/1+ 0.45/2+ 0.18/3+ 0.28/4
32	0.12/1+ 0.16/2+ 0.04/3+ 0.18/4
33	0.27/1+ 0.54/2+ 0.18/3+ 0.72/4
34	0.27/1+ 0.36/2+ 0.09/3+ 0.32/4

i-20 файл о20b2A