

Nikolaenko Nastya_ 06.11.2016

Task №10.

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33		
		А	Б	В	Г	Д	Е	Ё	Ж	З	И	Й	К	Л	М	Н	О	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я		
1	А		1	0.1	0.1	0.2	0.4	0.3	0.3	0.2	0	0.2	0.2	0.3	0.47	0.1	0.1		0.3	0.2	0	0.3	0	0.21	0	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0	0.1	0.2	
2	Б	0.1		1	0.8	0.7	0.3	0.2	0.2	0.3	0.2	0.2	0.2	0.3	0.1	0.3		0.2	0.2	0	0.1	0	0	0	0	0.1	0	0	0.3	0.4	0.3	0	0	0.1		
3	В	0.1	0.8		1	0.2	0.1	0.75	0.7	0.1	0.6	0	0	0.1	0.1	0	0	0.1	0	0.7	0.1	0.1	0.1	0	0	0.1	0	0	0.6	0.4	0.7	0	0	0.1		
4	Г	0.2	0.7	0.2		1	0.2	0.6	0.6	0.1	0	0.1	0.1	0.3	0.6	0.2	0.3	0.1	0.8	0.7	0.2	0.6	0	0.1	0	0.1	0.1	0	0	0.1	0.1	0.2	0	0.1		
5	Д	0.4	0.3	0.1	0.2		1	0.1	0.1	0.2	0.1	0	0	0.1	0.7	0.1	0.1	0.1	0.6	0.2	0	0.1	0	0.1	0	0.1	0.1	0	0	0.1	0.1	0.1	0	0.1	0.1	
6	Е	0.3	0.2	0.75	0.6	0.1		1	0.9	0.3	0.6	0.1	0.1	0.3	0.2	0.1	0	0	0.1	0.4	0.3	0.3	0.1	0.1	0	0.3	0.2	0.1	0.1	0.3	0.1	0.3	0	0.1	0.1	
7	Ё	0.3	0.2	0.7	0.6	0.1	0.9		1	0.3	0.6	0.1	0.1	0.2	0.1	0.1	0	0	0.1	0.3	0.3	0.3	0.1	0.1	0	0.2	0.2	0.1	0.1	0.3	0.1	0.3	0	0.1	0.1	
8	Ж	0.2	0.3	0.1	0.1	0.2	0.3	0.3		1	0.3	0.1	0.1	0.7	0.1	0.1	0.1	0	0.1	0.2	0.1	0.4	0.1	0.3	0.6	0.1	0.7	0.1	0.1	0	0	0.1	0.4	0.1	0.3	
9	З		0	0.2	0.6	0	0.1	0.6	0.6	0.3		1	0.1	0.1	0.2	0.1	0.1	0	0.1	0.1	0.1	0.2	0	0.2	0	0.1	0.2	0	0	0.1	0.1	0.1	0.7	0.1	0.2	
10	И	0.2	0.2		0	0.1	0	0.1	0.1	0.1	0.1		1	0.9	0.3	0.1	0.1	0.7	0	0.2	0.2	0	0.1	0	0	0	0.6	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1
11	Й	0.2	0.2		0	0.1	0	0.1	0.1	0.1	0.1	0.9		1	0.3	0.1	0.3	0.7	0.1	0.2	0.1	0	0.1	0	0	0	0.6	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.1
12	К	0.3	0.2	0.1	0.3	0.1	0.3	0.2	0.7	0.2	0.3	0.3		1	0.5	0.3	0.2	0	0.1	0.3	0.1	0.4	0.1	0	0.1	0.1	0	0	0.1	0	0.2	0	0.1	0.1	0.1	
13	Л	0.47	0.3	0.1	0.6	0.7	0.2	0.1	0.1	0.1	0.1	0.1	0.5		1	0.1	0.1	0	0.7	0.1	0	0.2	0	0.1	0	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0	0	0.2	
14	М	0.1	0.1	0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.3	0.3	0.1		1	0.4	0	0.2	0.1	0.1	0.2	0	0.1	0	0.2	0.1	0.3	0.2	0.1	0.5	0.1	0.1	0.1	0	
15	Н	0.1	0.3	0	0.3	0.1	0	0	0.1	0	0.7	0.7	0.2	0.1	0.4		1	0.1	0.7	0.1	0.1	0.3	0.1	0	0.6	0.1	0.2	0.1	0.1	0.4	0.1	0.1	0.1	0.1	0.1	
16	О	0	0	0.1	0.1	0.1	0	0	0	0.1	0	0.1	0	0	0	0.1		1	0.3	0.1	0.8	0.1	0.1	0.3	0.1	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.7	0.65	0.1
17	П	0.3	0.2		0.8	0.6	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.7	0.2	0.7	0.3		1	0.3	0.2	0.2	0	0	0	0.3	0.3	0.1	0.1	0.2	0.3	0.1	0	0.2	0.1	
18	Р	0.2	0.2	0.7	0.7	0.2	0.4	0.3	0.2	0.1	0.2	0.1	0.3	0.1	0.1	0.1	0.1	0.3		1	0.2	0.1	0	0.6	0	0.1	0.1	0.1	0.1	0.2	0.2	0.4	0	0.1	0.1	
19	С		0	0	0.1	0.2	0	0.3	0.3	0.1	0.1	0	0	0.1	0	0.1	0.8	0.2	0.2		1	0.1	0	0.1	0	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.2	0.1	0.1	
20	Т	0.3	0.1	0.1	0.6	0.1	0.3	0.3	0.4	0.2	0.1	0.1	0.4	0.2	0.2	0.3	0.1	0.2	0.1	0.1		1	0.1	0.3	0	0.1	0.2	0.1	0.1	0.2	0.1	0.2	0.1	0.2	0	0.1
21	У		0	0	0	0	0.1	0.1	0.1	0	0	0	0	0	0	0	0.1	0	0	0	0.1		1	0.1	0.7	0.1	0.6	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1
22	Ф	0.21		0	0.1	0.1	0.1	0.1	0.3	0.2	0	0	0.1	0.1	0.1	0.1	0.3		0.6	0.1	0.3	0.1		1	0.1	0.1	0.6	0.1	0.1	0.2	0.1	0.3	0.1	0.1	0.1	
23	Х		0	0	0	0	0	0	0.6	0	0	0	0	0	0	0	0.1	0	0	0	0	0.7	0.1		1	0.1	0	0	0	0.1	0.1	0	0	0.1	0	
24	Ц	0.3		0	0	0.1	0.1	0.3	0.2	0.1	0.1	0.6	0.6	0.1	0.1	0.2	0.6	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1		1	0.1	0.6	0.7	0.1	0.2	0.1	0	0	
25	Ч	0.3	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.7	0.2	0.1	0.1	0.1	0.2	0.1	0.1	0.2	0.3	0.1	0.2	0.2	0.6	0.6	0	0.1		1	0.1	0.1	0.2	0.1	0.2	0	0	
26	Ш	0.2		0	0	0	0.1	0.1	0.1	0.1	0	0.1	0.1	0	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0	0.6	0.1		1	0.9	0.1	0.2	0.1	0	0		
27	Щ	0.2		0	0	0	0.1	0.1	0.1	0.1	0	0.1	0.1	0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0	0.7	0.1	0.9		1	0.1	0.2	0.1	0	0		
28	Ъ	0.1	0.3	0.6	0.1	0.1	0.3	0.3	0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.1	0.1		1	0.6	0.9	0	0.1	
29	Ы	0.1	0.4	0.4	0.1	0.1	0.1	0.1	0	0	0.1	0.2	0.2	0	0.1	0.5	0.4	0.1	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	0.2	0.2	0.6	1	0.8	0	0.1	0.1	
30	Ь	0.1	0.3	0.7	0.2	0.1	0.3	0.3	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.4	0.2	0.2	0.1	0.3	0	0.1	0.2	0.1	0.1	0.9	0.8		1	0	0.1	0.2	
31	Э		0	0	0	0	0	0	0.4	0.7	0.1	0.1	0	0	0	0.1	0	0.7	0	0	0.2	0	0.1	0.1	0	0	0	0	0	0	0	0	0	1	0.1	0.1
32	Ю	0.1		0	0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.1	0	0	0.1	0.1	0.65	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0	0	0	0	0.1	0.1	0.1	0.1		1	0.1
33	Я	0.2	0.1	0.1		0	0.1	0.1	0.1	0.3	0.2	0.1	0.1	0.1	0.2		0	0.1	0.1	0.1	0.1	0.3	0.1	0.1	0	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1	

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	
		А	Б	В	Г	Д	Е	Ё	Ж	З	И	Й	К	Л	М	Н	О	П	Р	С	Т	У	Ф	Х	Ц	Ч	Ш	Щ	Ъ	Ы	Ь	Э	Ю	Я	
1	А	0	0	0	0	0.7	0	0	0	0	0	0	0.8	0.1	0.6	0.2	0.8	0	0	0	0	0	0	0	0.6	0	0	0	0	0	0	0	0	0	
2	Б	0	0	0.9	0	0	0.6	0.6	0	0.7	0	0	0	0.2	0.01	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	0.7	0.7	0.8	0	0	
3	В	0	0.9	0	0	0	0.6	0.6	0	0.9	0	0	0	0.1	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	0.6	0.7	0.8	0	0	
4	Г	0	0	0	0	0	0	0	0	0	0	0	0	0.3	0.01	0	0.8	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
5	Д	0.7	0	0	0	0	0	0	0	0	0	0	0	0.6	0.6	0.7	0	0	0	0	0	0	0	0	0	0.7	0	0	0	0	0	0	0	0	
6	Е	0	0.6	0.6	0	0.2	0	0.9	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0.6	0.6	0.6	0	0	
7	Ё	0	0.6	0.6	0	0	0.9	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0.6	0.6	0.6	0	0	
8	Ж	0	0	0	0	0	0	0	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
9	З	0.2	0.8	0.9	0.1	0	0.6	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0.6	0.8	0.9	0	0	
10	И	0	0	0	0	0	0	0	0	0	0	0.9	0	0	0.7	0.1	0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
11	Й	0	0	0	0	0	0	0	0	0	0.9	0	0	0	0.7	0.2	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
12	К	0	0	0	0	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
13	Л	0.8	0.3	0.2	0.1	0.7	0	0	0	0	0	0	0	0	0.6	0.8	0	0	0	0	0	0	0	0	0	0.6	0	0	0	0	0	0	0	0	
14	М	0	0.2	0.1	0.2	0	0	0	0	0.7	0.7	0	0	0	0	0.1	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0	0	0	0	
15	Н	0.6	0	0	0	0.6	0	0	0	0	0	0	0	0.6	0	0	0.6	0	0	0	0	0	0	0	0	0.8	0	0	0	0	0	0	0	0	
16	О	0	0	0	0	0	0	0	0	0	0	0	0	0.2	0	0	0	0	0.6	0	0	0	0	0	0	0.1	0	0	0	0	0	0	0	0	
17	П	0.8	0.1	0.1	0.2	0.7	0	0	0	0	0	0	0.8	0.6	0	0	0	0	0	0	0	0	0	0	0	0.6	0	0	0	0	0	0	0	0	
18	Р	0	0	0	0.8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
19	С	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20	Т	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
21	У	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
22	Ф	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
23	Х	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
24	Ц	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	0.9	0	0	0	0	0	0	
25	Ч	0.6	0	0	0	0.6	0	0	0	0	0	0	0	0.6	0.1	0.2	0.3	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
26	Ш	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	0	0.9	0	0	0	0	0	0	0	
27	Щ	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	0.9	0	0	0	0	0	0	0	0	
28	Ъ	0	0.6	0.6	0.3	0.2	0.6	0.6	0	0.6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	0.9	0.6	0	0	
29	Ы	0	0.6	0.6	0.2	0.1	0.7	0.6	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.8	0	0.8	0.6	0	0
30	Ь	0	0.6	0.6	0.1	0.2	0.7	0.7	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.9	0.8	0	0.6	0	0	
31	Э	0	0.8	0.8	0.2	0.3	0.6	0.6	0	0.9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.6	0.6	0.6	0	0	0
32	Ю	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0.7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
33	Я	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

1-st cluster

Step 1:

$I =$

{1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,29,30,31,32,33}

$C = \{\}$

Step 2-4:

find maximum value $a_{3,9} = 0.9$ put index to $C = \{\}$; $C = \{3,9\}$, find index of the columns, where sum is maximum: $\max_{31} = 1.7$, $\max_{28} = 2.5$, $\max_{30} = 2.8$, $\max_{29} = 2.9$, $\max_{26} = 4.4$, $\max_{27} = 5.2$,

$C = \{3,9,31,2,30,28,29,6,7\}$

Step 5:

$I = I - C = \{1,4,5,8,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,32,33\}$

2-nd cluster

Step 1 :

$I = \{1,4,5,8,10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,32,33\}$

Step 2-4:

find maximum value $a_{10,11} = 0.9$ put index to $C=\{\}$; $C=\{10,11\}$, find index of the columns, where sum is maximum: $\max_{14} = 1,4$

$C = \{10,11,14\}$

Step 5 :

$I = I - C = \{1,4,5,8,12,13,15,16,17,18,19,20,21,22,23,24,25,26,27,32,33\}$

3-rd cluster

Step 1 :

$I = \{1,4,5,8,12,13,15,16,17,18,19,20,21,22,23,24,25,26,27,32,33\}$

Step 2-4

Find maximum value $a_{24,26} = 0.9$ put index to $C=\{\}$; $C=\{24,26\}$, find index of the columns, where sum is maximum: $\max_{27} = 1,8$

$C = \{24,26,27\}$

Step 5:

$I = I - C = \{1,4,5,8,12,13,15,16,17,18,19,20,21,22,23,25,32,33\}$

4-th cluster

Step 1:

$I = \{1,4,5,8,12,13,15,16,17,18,19,20,21,22,23,25,32,33\}$

Step 2-4:

find maximum value $a_{4,18} = 0.8$ put index to $C=\{\}$; $C=\{4,18\}$

$C = \{4,18\}$

Step 5:

$I = I - C = \{1,5,8,12,13,15,16,17,19,20,21,22,23,25,32,33\}$

5- th cluster

Step 1:

$$I = \{1,5,8,12,13,15,16,17,19,20,21,22,23,25,32,33\}$$

Step 2-4

find maximum value $a_{1,17} = 0.8$ put index to $C=\{\}$; $C=\{1,17\}$ find index of the columns, where sum is maximum: $\max_{13} = 1.6$, $\max_5 = 2.1$, $\max_{25} = 2.5$,

$$C = \{1,17,13,5,25\}$$

Step 5:

$$I = I - C = \{8,12,15,16,19,20,21,22,23,32,33\}$$

6-th cluster

Step 1:

$$I = \{8,12,15,16,19,20,21,22,23,32,33\}$$

Step 2-4:

find maximum value $a_{8,12} = 0.7$ put index to $C=\{\}$; $C = \{8,12\}$

Step 5:

$$I = I - C = \{15,16,19,20,21,22,23,32,33\}$$

7-th cluster

Step 1:

$$I = \{15,16,19,20,21,22,23,32,33\}$$

Step 2-4:

find maximum value $a_{16,19} = 0.6$ put index to $C=\{\}$; $C = \{16,19\}$

Step 5:

$$I = I - C = \{15, 20,21,22,23,32,33\}$$

Only zeros left so last letters we put in separate clusters

$$C_7 = \{16,19\}; C_8 = \{15\}; C_9 = \{20\}; C_{10} = \{21\}; C_{11} = \{22\}; C_{12} = \{23\}; C_{13} = \{32\}; C_{14} = \{33\};$$

So final cluster will be:

$C = \{\{B, 3, \text{Э}, \text{Б}, \text{Ь}, \text{Ы}, \text{Е}, \text{Ё}\}, \{\text{И}, \text{Й}, \text{М}\}, \{\text{Ц}, \text{Ш}, \text{Щ}\}, \{\text{Г}, \text{Р}\}, \{\text{А}, \text{П}, \text{Л}, \text{Д}, \text{Ч}\}, \{\text{Ж}, \text{К}\}, \{\text{О}, \text{С}\}, \{\text{Н}\}, \{\text{Т}\}, \{\text{У}\}, \{\text{Х}\}, \{\text{Ю}\}, \{\text{Я}\}\}$