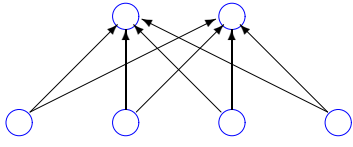


Сеть Кохонена

Для обучения сети SOFM, имеющей четыре входных элемента и два кластерных, используются четыре образца, закодированные 1 (закрашенный квадрат) и 0 (пустой квадрат) слева направо, сверху вниз. Даны начальные весовые значения $W_{i,j}$ и норма обучения η . Используя евклидову метрику, определить принадлежность образцов кластерным элементам и вычислить весовые значения после первого цикла обработки данных.

Задача 9.1

$\eta = 0.5$



1)

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2)

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3)

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4)

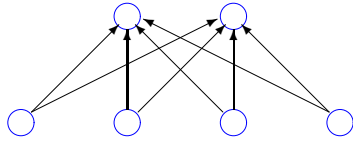
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$$W = \begin{vmatrix} 0.6 & 0.6 & 0.1 & 0.6 \\ 0.1 & 0.8 & 0.7 & 0.7 \end{vmatrix}$$

9.3

Задача 9.2

$\eta = 0.5$



1)

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4)

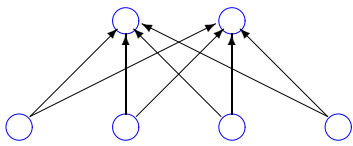
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$$W = \begin{vmatrix} 0 & 0.7 & 0.4 & 0.1 \\ 0.6 & 0.3 & 0.6 & 0.1 \end{vmatrix}$$

9.3

Задача 9.3

$\eta = 0.5$



1)

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4)

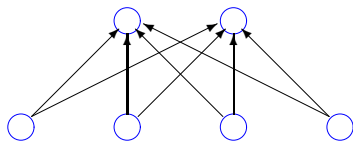
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$$W = \begin{vmatrix} 0.8 & 0.7 & 0.9 & 0.9 \\ 0.6 & 1 & 0.7 & 0.9 \end{vmatrix}$$

9.3

Задача 9.4

$\eta = 0.5$



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4)

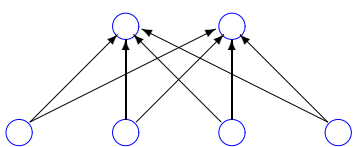
| | |
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$$W = \begin{vmatrix} 0.9 & 0.7 & 0.6 & 0.5 \\ 0.7 & 0.3 & 1 & 1 \end{vmatrix}$$

9.3

Задача 9.5

$\eta = 0.5$



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2)

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3)

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4)

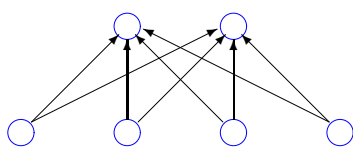
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$$W = \begin{vmatrix} 0.7 & 0.5 & 0.3 & 0.9 \\ 0.2 & 0.2 & 0.3 & 0.8 \end{vmatrix}$$

9.3

Задача 9.6

$\eta = 0.4$



1)

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3)

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4)

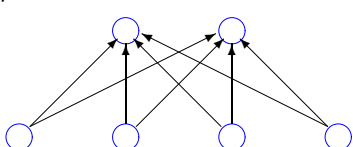
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| | |

$$W = \begin{vmatrix} 0.8 & 0.1 & 0.4 & 0.6 \\ 0.5 & 1 & 1 & 0.9 \end{vmatrix}$$

9.3

Задача 9.7

$\eta = 0.5$



1)

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2)

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3)

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4)

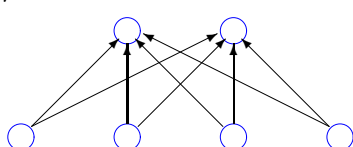
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$$W = \begin{vmatrix} 0.2 & 0.8 & 0.6 & 0.9 \\ 0.8 & 0.9 & 0.4 & 0.3 \end{vmatrix}$$

9.3

Задача 9.8

$\eta = 0.5$



1)

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2)

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3)

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4)

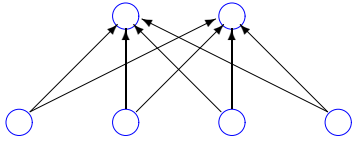
| | |
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| | |

$$W = \begin{vmatrix} 0.6 & 1 & 0.5 & 0.3 \\ 0.3 & 0.5 & 0.5 & 0.7 \end{vmatrix}$$

9.3

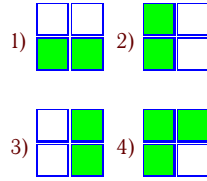
Задача 9.9

$\eta = 0.5$



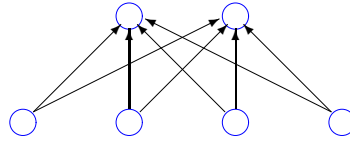
$$W = \begin{vmatrix} 0.6 & 0.7 & 0.8 & 0.5 \\ 0.1 & 0.2 & 1 & 0.7 \end{vmatrix}$$

9.3



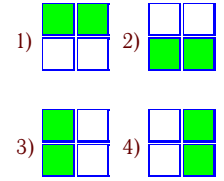
Задача 9.10

$\eta = 0.8$



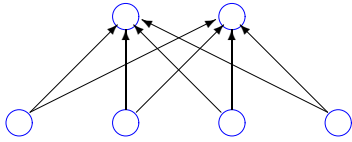
$$W = \begin{vmatrix} 0.4 & 0.4 & 0.5 & 0.6 \\ 0.5 & 0.7 & 0.6 & 0.5 \end{vmatrix}$$

9.3



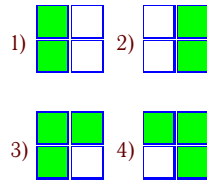
Задача 9.11

$\eta = 0.5$



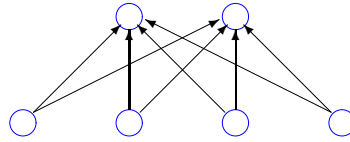
$$W = \begin{vmatrix} 0.8 & 0.7 & 0.5 & 0.9 \\ 0.6 & 1 & 0.2 & 0.9 \end{vmatrix}$$

9.3



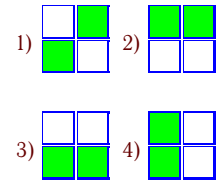
Задача 9.12

$\eta = 0.6$



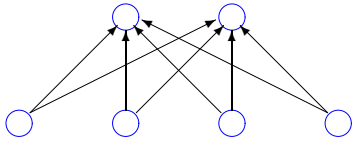
$$W = \begin{vmatrix} 0.1 & 0.2 & 0.1 & 1 \\ 0.1 & 0.9 & 0.9 & 0.2 \end{vmatrix}$$

9.3



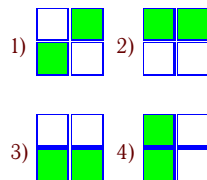
Задача 9.13

$\eta = 0.5$



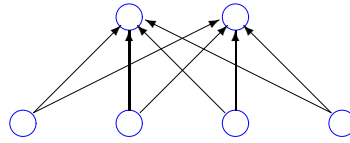
$$W = \begin{vmatrix} 0.1 & 0.6 & 0.9 & 0.5 \\ 0.5 & 0.7 & 0.7 & 0.2 \end{vmatrix}$$

9.3



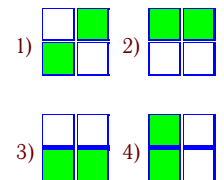
Задача 9.14

$\eta = 0.8$



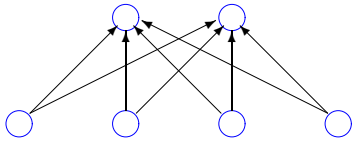
$$W = \begin{vmatrix} 0.2 & 0.4 & 0.4 & 0.8 \\ 0.8 & 0.9 & 0.1 & 0.3 \end{vmatrix}$$

9.3



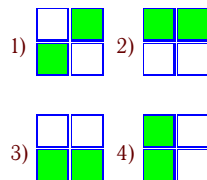
Задача 9.15

$\eta = 0.5$



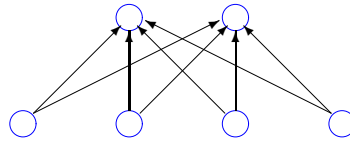
$$W = \begin{vmatrix} 0.2 & 0.8 & 0.7 & 0.5 \\ 0.5 & 0.6 & 1 & 0.3 \end{vmatrix}$$

9.3



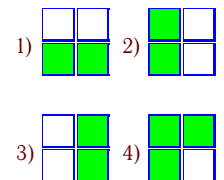
Задача 9.16

$\eta = 0.7$



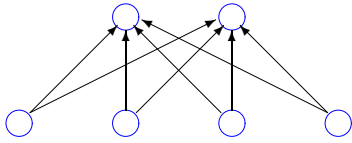
$$W = \begin{vmatrix} 0.5 & 0.3 & 0.8 & 0.6 \\ 0.2 & 1 & 0.4 & 0.6 \end{vmatrix}$$

9.3



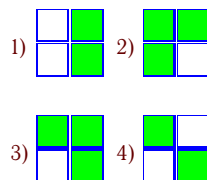
Задача 9.17

$\eta = 0.6$



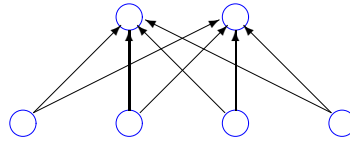
$$W = \begin{vmatrix} 0.9 & 0.2 & 0.2 & 0.1 \\ 0.1 & 0.1 & 0.5 & 1 \end{vmatrix}$$

9.3



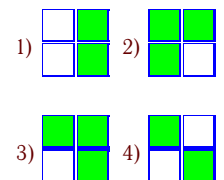
Задача 9.18

$\eta = 0.5$



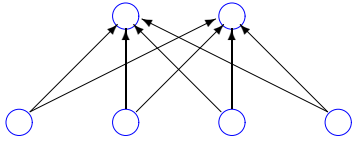
$$W = \begin{vmatrix} 0.9 & 0.9 & 0.9 & 0.8 \\ 0.1 & 0.3 & 0.4 & 1 \end{vmatrix}$$

9.3



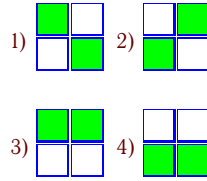
Задача 9.19

$\eta = 0.5$



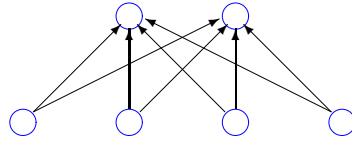
$$W = \begin{vmatrix} 0 & 0.8 & 0.2 & 0.9 \\ 0.5 & 0.1 & 0.9 & 0.1 \end{vmatrix}$$

9.3



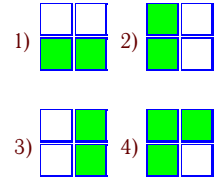
Задача 9.20

$\eta = 0.5$



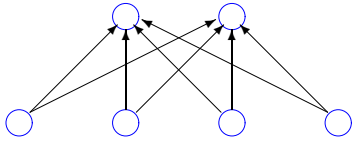
$$W = \begin{vmatrix} 0.5 & 0.5 & 0.6 & 0.1 \\ 0.1 & 0.1 & 0.4 & 0.6 \end{vmatrix}$$

9.3



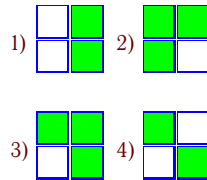
Задача 9.21

$\eta = 0.5$



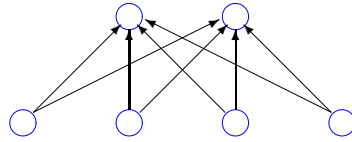
$$W = \begin{vmatrix} 0.9 & 0.6 & 0.4 & 0.9 \\ 0.9 & 0.2 & 0.1 & 1 \end{vmatrix}$$

9.3



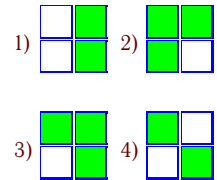
Задача 9.22

$\eta = 0.5$



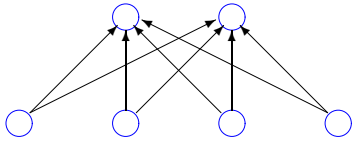
$$W = \begin{vmatrix} 1 & 0.9 & 0.3 & 0.4 \\ 0.4 & 0.2 & 0.2 & 1.1 \end{vmatrix}$$

9.3



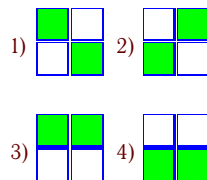
Задача 9.23

$\eta = 0.7$



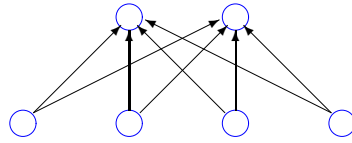
$$W = \begin{vmatrix} 0 & 0.3 & 0.4 & 1 \\ 0.6 & 0.8 & 0.5 & 0.1 \end{vmatrix}$$

9.3



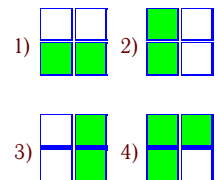
Задача 9.24

$\eta = 0.4$



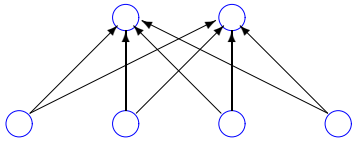
$$W = \begin{vmatrix} 0.6 & 0.1 & 0.9 & 0.8 \\ 0.9 & 0.8 & 0.6 & 0.7 \end{vmatrix}$$

9.3



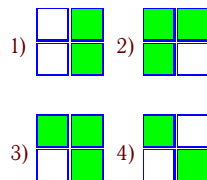
Задача 9.25

$\eta = 0.5$



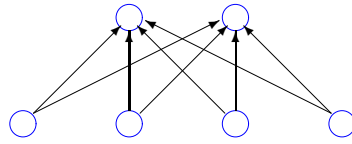
$$W = \begin{vmatrix} 1 & 0.8 & 0.3 & 0.1 \\ 1 & 0.7 & 0.7 & 1.1 \end{vmatrix}$$

9.3



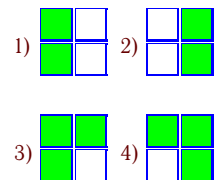
Задача 9.26

$\eta = 0.5$



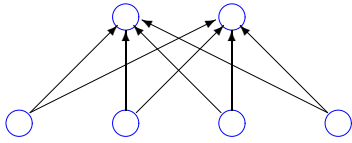
$$W = \begin{vmatrix} 0.8 & 0.7 & 0.2 & 0.2 \\ 0.7 & 0.3 & 0.4 & 0.9 \end{vmatrix}$$

9.3



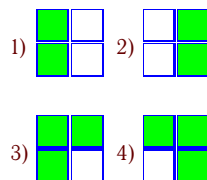
Задача 9.27

$\eta = 0.5$



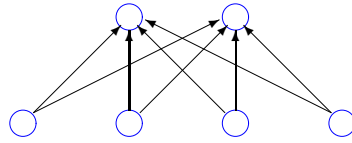
$$W = \begin{vmatrix} 0.8 & 0.6 & 0.2 & 0.1 \\ 0.4 & 0.2 & 0.5 & 0.9 \end{vmatrix}$$

9.3



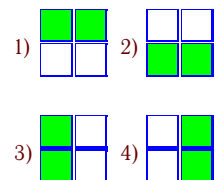
Задача 9.28

$\eta = 0.5$



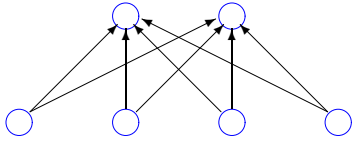
$$W = \begin{vmatrix} 0.3 & 0.5 & 0.7 & 0.4 \\ 0.2 & 0.7 & 0.9 & 0.4 \end{vmatrix}$$

9.3



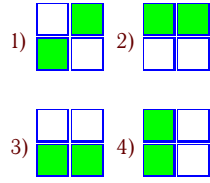
Задача 9.29

$\eta = 0.7$



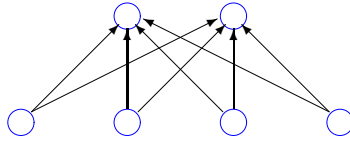
$$W = \begin{vmatrix} 0.2 & 0.3 & 0.4 & 0.6 \\ 0.7 & 0.1 & 1 & 0.3 \end{vmatrix}$$

9.3



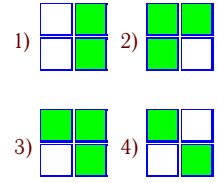
Задача 9.30

$\eta = 0.7$



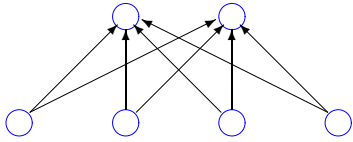
$$W = \begin{vmatrix} 0.9 & 0.3 & 0.1 & 0.7 \\ 0.4 & 0.7 & 0.7 & 1 \end{vmatrix}$$

9.3



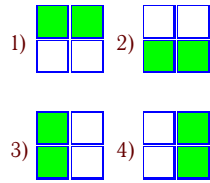
Задача 9.31

$\eta = 0.5$



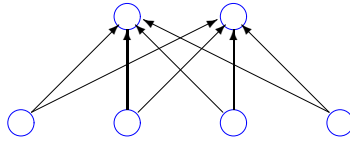
$$W = \begin{vmatrix} 0.4 & 0.9 & 0.9 & 0.2 \\ 0.1 & 0.3 & 0.3 & 0.5 \end{vmatrix}$$

9.3



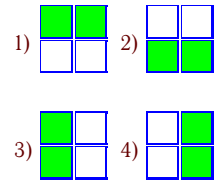
Задача 9.32

$\eta = 0.5$



$$W = \begin{vmatrix} 0.4 & 0.6 & 0.3 & 0.6 \\ 0.9 & 0.1 & 0.4 & 0.5 \end{vmatrix}$$

9.3



Сеть Кохонена

| № | W | | | | | | | | |
|----|------------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1 | 2, 1, 2, 1 | 0.900 | 0.650 | 0.775 | 0.150 | 0.025 | 0.700 | 0.425 | 0.925 |
| 2 | 2, 1, 2, 1 | 0.000 | 0.425 | 0.850 | 0.525 | 0.900 | 0.575 | 0.150 | 0.275 |
| 3 | 1, 2, 1, 2 | 0.950 | 0.675 | 0.975 | 0.225 | 0.650 | 1.000 | 0.175 | 0.975 |
| 4 | 1, 1, 1, 1 | 0.931 | 0.481 | 0.163 | 0.844 | 0.700 | 0.300 | 1.000 | 1.000 |
| 5 | 1, 2, 1, 2 | 0.925 | 0.625 | 0.825 | 0.225 | 0.550 | 0.800 | 0.075 | 0.950 |
| 6 | 1, 2, 1, 2 | 0.928 | 0.436 | 0.784 | 0.216 | 0.580 | 1.000 | 0.360 | 0.964 |
| 7 | 1, 2, 1, 2 | 0.050 | 0.450 | 0.900 | 0.725 | 0.950 | 0.475 | 0.600 | 0.075 |
| 8 | 2, 1, 2, 1 | 0.900 | 0.750 | 0.875 | 0.075 | 0.075 | 0.625 | 0.375 | 0.925 |
| 9 | 2, 1, 2, 1 | 0.900 | 0.675 | 0.950 | 0.125 | 0.025 | 0.550 | 0.500 | 0.925 |
| 10 | 2, 1, 2, 1 | 0.016 | 0.816 | 0.180 | 0.984 | 0.980 | 0.188 | 0.824 | 0.020 |
| 11 | 1, 2, 1, 2 | 0.950 | 0.675 | 0.875 | 0.225 | 0.650 | 1.000 | 0.050 | 0.975 |
| 12 | 2, 2, 1, 2 | 0.040 | 0.080 | 0.640 | 1.000 | 0.846 | 0.394 | 0.754 | 0.013 |
| 13 | 1, 2, 1, 2 | 0.025 | 0.400 | 0.975 | 0.625 | 0.875 | 0.425 | 0.675 | 0.050 |
| 14 | 1, 2, 1, 1 | 0.802 | 0.035 | 0.995 | 0.166 | 0.960 | 0.980 | 0.020 | 0.060 |
| 15 | 1, 2, 1, 2 | 0.050 | 0.450 | 0.925 | 0.625 | 0.875 | 0.400 | 0.750 | 0.075 |
| 16 | 1, 1, 2, 1 | 0.923 | 0.708 | 0.995 | 0.079 | 0.060 | 1.000 | 0.120 | 0.880 |
| 17 | 2, 1, 2, 2 | 0.960 | 0.680 | 0.680 | 0.040 | 0.846 | 0.342 | 0.032 | 1.000 |
| 18 | 2, 1, 2, 2 | 0.950 | 0.950 | 0.950 | 0.400 | 0.762 | 0.413 | 0.050 | 1.000 |
| 19 | 1, 2, 1, 2 | 0.750 | 0.700 | 0.050 | 0.475 | 0.125 | 0.275 | 0.975 | 0.525 |
| 20 | 2, 1, 2, 1 | 0.875 | 0.625 | 0.900 | 0.025 | 0.025 | 0.525 | 0.350 | 0.900 |
| 21 | 1, 1, 2, 2 | 0.725 | 0.900 | 0.600 | 0.475 | 0.975 | 0.300 | 0.025 | 1.000 |
| 22 | 2, 1, 2, 2 | 1.000 | 0.950 | 0.650 | 0.200 | 0.800 | 0.400 | 0.025 | 1.013 |
| 23 | 1, 2, 2, 1 | 0.210 | 0.027 | 0.736 | 1.000 | 0.754 | 0.982 | 0.255 | 0.009 |
| 24 | 1, 1, 2, 2 | 0.616 | 0.036 | 0.964 | 0.528 | 0.724 | 0.928 | 0.616 | 0.492 |
| 25 | 2, 1, 2, 2 | 1.000 | 0.900 | 0.650 | 0.050 | 0.875 | 0.463 | 0.087 | 1.013 |
| 26 | 1, 2, 1, 2 | 0.950 | 0.675 | 0.800 | 0.050 | 0.675 | 0.825 | 0.100 | 0.975 |
| 27 | 1, 2, 1, 2 | 0.950 | 0.650 | 0.800 | 0.025 | 0.600 | 0.800 | 0.125 | 0.975 |
| 28 | 1, 2, 1, 2 | 0.825 | 0.375 | 0.675 | 0.100 | 0.050 | 0.675 | 0.475 | 0.850 |
| 29 | 1, 1, 2, 2 | 0.718 | 0.937 | 0.246 | 0.054 | 0.763 | 0.009 | 1.000 | 0.237 |
| 30 | 2, 1, 2, 2 | 0.970 | 0.790 | 0.730 | 0.210 | 0.921 | 0.292 | 0.019 | 1.000 |
| 31 | 1, 2, 1, 2 | 0.850 | 0.475 | 0.725 | 0.050 | 0.025 | 0.575 | 0.325 | 0.875 |
| 32 | 1, 2, 2, 1 | 0.350 | 0.900 | 0.075 | 0.650 | 0.725 | 0.025 | 0.850 | 0.375 |