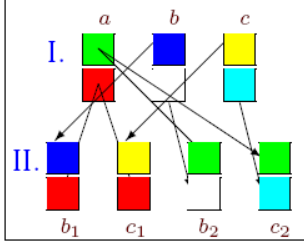
Test 1. Genetic algorithm for graph vertices allocation.

The initial population is given. It consists of 4 chromosomes with 2 genes X and Y. The quality indicator of the chromosome is evaluated by the function Z. If the quality of the chromosome is equal, the chromosome with the highest number is preferred. At every stage chromosome A of the highest quality creates 4 new chromosomes b1, b2,c1,c2, by sharing genes with chromosomes of the lower quality B and C in the form described. The last chromosome (of the lowest quality) is removed from the population.

Find a maximum quality indicator of the chromosome in the population and a general quality of the population after 4 phases of the evolution.

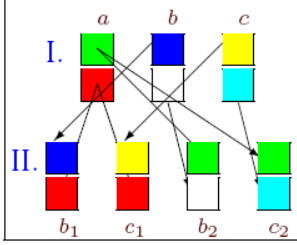
Задача 14.1.



x	-2	-1	0	1
y	-2	-1	0	1

$$Z = \frac{x - 3y + 1}{3x^2 + 3y^2 + 1}$$

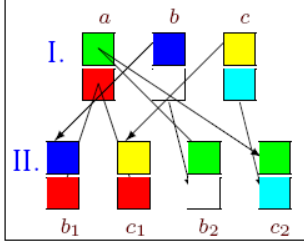
Задача 14.2.



x	-4	-2	0	2
y	-1	1	0	-2

$$Z = \frac{x - 2y - 3}{x^2 + 3y^2 + 1}$$

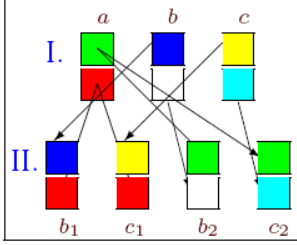
Задача 14.3.



x	-1	0	2	3
y	-2	1	0	-1

$$Z = \frac{x - 3y - 2}{x^2 + y^2 + 1}$$

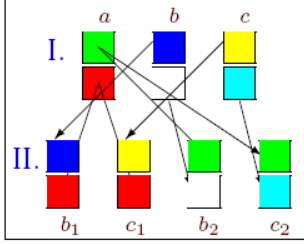
Задача 14.4.



x	-1	0	2	4
y	-2	1	-1	0

$$Z = \frac{x + 3y}{3x^2 + y^2 + 1}$$

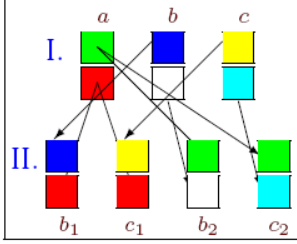
Задача 14.5.



x	-2	-1	0	2
y	-2	0	-1	1

$$Z = \frac{x - 3y + 1}{3x^2 + y^2 + 1}$$

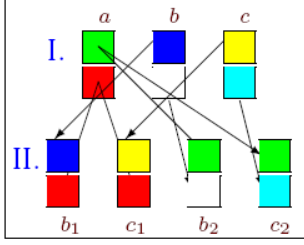
Задача 14.6.



x	-5	-3	-2	-1
y	-1	-2	0	1

$$Z = \frac{x + 3y}{x^2 + y^2 + 1}$$

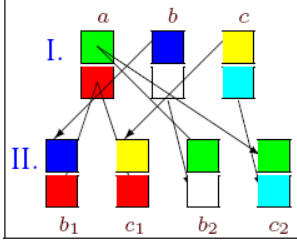
Задача 14.7.



x	-5	-3	-2	0
y	-1	-2	0	1

$$Z = \frac{x + 3y - 3}{3x^2 + y^2 + 1}$$

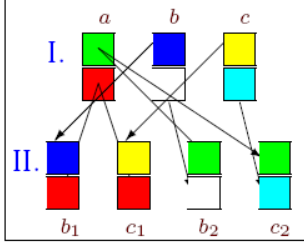
Задача 14.8.



x	-5	-3	-2	-1
y	-1	-2	0	1

$$Z = \frac{x - 3y - 3}{x^2 + 2y^2 + 1}$$

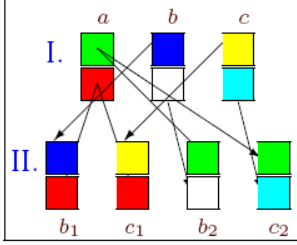
Задача 14.9.



x	-1	0	2	3
y	0	-1	-2	1

$$Z = \frac{x - 2y}{x^2 + y^2 + 1}$$

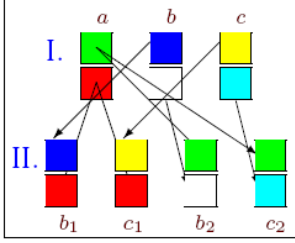
Задача 14.10.



x	-1	0	2	3
y	0	1	-2	2

$$Z = \frac{x - 3y}{2x^2 + 2y^2 + 1}$$

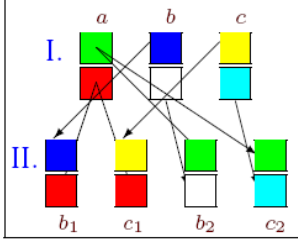
Задача 14.11.



x	-5	-3	-2	0
y	1	-2	-1	0

$$Z = \frac{x - 2y + 1}{x^2 + y^2 + 1}$$

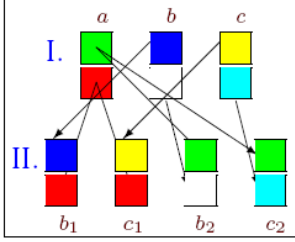
Задача 14.12.



x	-1	0	2	3
y	0	-1	1	2

$$Z = \frac{x - 3y - 3}{x^2 + 2y^2 + 1}$$

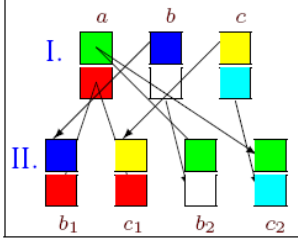
Задача 14.13.



x	-2	-1	0	2
y	-2	-1	1	0

$$Z = \frac{x - y}{2x^2 + 2y^2 + 1}$$

Задача 14.14.



x	-5	-3	-2	0
y	-1	-2	0	1

$$Z = \frac{x - 2y - 3}{3x^2 + y^2 + 1}$$