**Practical work assignments 6**

In this work, each student will have to complete two tasks according to their variant number. The variant number corresponds to the student's number in the journal.

**Task 1**

**Variants:**

1. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=2.5.

Which of the objects will fall into the same cluster as object A?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 1 |
| **B** | 3 | 0 | 1 | 2 | 5 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 5 | 1 | 3 | 4 | 0 |

2. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=3.

Which of the objects will fall into the same cluster as object A?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 6 | 3 | 5 |
| **B** | 3 | 0 | 1 | 2 | 5 |
| **C** | 6 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 5 | 1 | 3 | 4 | 0 |

3. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=2.

Which of the objects will fall into the same cluster as object A?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 5 |
| **B** | 3 | 0 | 4 | 2 | 5 |
| **C** | 4 | 4 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 3 |
| **E** | 5 | 1 | 3 | 3 | 0 |

4. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=2.1.

Which of the objects will fall into the same cluster as object A?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 2 | 4 | 3 | 5 |
| **B** | 2 | 0 | 1 | 2 | 5 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 5 | 1 | 3 | 4 | 0 |

5. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=2.

Which of the objects will fall into the same cluster as object A?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 5 |
| **B** | 3 | 0 | 1 | 2 | 5 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 2 |
| **E** | 5 | 1 | 3 | 2 | 0 |

6. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=4.

Which of the objects will fall into the same cluster as object D?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 7 |
| **B** | 3 | 0 | 1 | 2 | 5 |
| **C** | 4 | 1 | 0 | 3 | 5 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 7 | 1 | 5 | 4 | 0 |

7. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=2.

Which of the objects will end up in the same cluster as object C?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 1 |
| **B** | 3 | 0 | 1 | 2 | 5 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 1 | 5 | 3 | 4 | 0 |

8. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=1.

Which of the objects will fall into the same cluster as object B?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 2 | 4 | 3 | 1 |
| **B** | 2 | 0 | 1 | 2 | 5 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 2 |
| **E** | 1 | 5 | 3 | 2 | 0 |

9. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=10.

Which of the objects will fall into the same cluster as object A?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 17 | 4 | 20 | 6 |
| **B** | 17 | 0 | 1 | 2 | 5 |
| **C** | 4 | 1 | 0 | 11 | 3 |
| **D** | 20 | 2 | 11 | 0 | 4 |
| **E** | 6 | 5 | 3 | 4 | 0 |

10. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=3.

Which of the objects will fall into the same cluster as object A?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 1 | 2 | 3 | 1 |
| **B** | 1 | 0 | 1 | 2 | 1 |
| **C** | 2 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 1 | 1 | 3 | 4 | 0 |

11. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=5.

Which of the objects will fall into the same cluster as object D?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 10 | 14 | 3 | 1 |
| **B** | 10 | 0 | 1 | 2 | 1 |
| **C** | 14 | 1 | 0 | 13 | 3 |
| **D** | 3 | 2 | 13 | 0 | 4 |
| **E** | 1 | 1 | 3 | 4 | 0 |

12. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=2.

Which of the objects will fall into the same cluster as object С?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 1 | 5 |
| **B** | 3 | 0 | 1 | 2 | 5 |
| **C** | 4 | 1 | 0 | 3 | 1 |
| **D** | 1 | 2 | 3 | 0 | 4 |
| **E** | 5 | 5 | 1 | 4 | 0 |

13. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=3.

Which of the objects will fall into the same cluster as object А?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 5 | 3 | 5 |
| **B** | 3 | 0 | 2 | 2 | 3 |
| **C** | 5 | 2 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 5 | 3 | 3 | 4 | 0 |

1. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=2.

Which of the objects will fall into the same cluster as object D?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 4 |
| **B** | 3 | 0 | 1 | 2 | 3 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 1 |
| **E** | 4 | 3 | 3 | 1 | 0 |

15. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=2.

Which of the objects will fall into the same cluster as object А?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 3 |
| **B** | 3 | 0 | 1 | 2 | 5 |
| **C** | 4 | 1 | 0 | 3 | 4 |
| **D** | 3 | 2 | 3 | 0 | 2 |
| **E** | 3 | 5 | 4 | 2 | 0 |

16. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=1,1.

Which of the objects will fall into the same cluster as object В?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 1 | 3 | 1 |
| **B** | 3 | 0 | 1 | 1 | 1 |
| **C** | 1 | 1 | 0 | 3 | 3 |
| **D** | 3 | 1 | 3 | 0 | 4 |
| **E** | 1 | 1 | 3 | 4 | 0 |

17. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=4.

Which of the objects will fall into the same cluster as object А?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 8 |
| **B** | 3 | 0 | 1 | 2 | 6 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 8 | 6 | 3 | 4 | 0 |

18. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=3.

Which of the objects will fall into the same cluster as object С?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 1 | 2 | 3 | 5 |
| **B** | 1 | 0 | 1 | 2 | 1 |
| **C** | 2 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 5 | 1 | 3 | 4 | 0 |

19. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=4.

Which of the objects will fall into the same cluster as object Е?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 4 | 5 |
| **B** | 3 | 0 | 1 | 5 | 5 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 4 | 5 | 3 | 0 | 4 |
| **E** | 5 | 5 | 3 | 4 | 0 |

20. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=5.

Which of the objects will fall into the same cluster as object В?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 6 | 3 | 4 |
| **B** | 3 | 0 | 1 | 2 | 5 |
| **C** | 6 | 1 | 0 | 3 | 7 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 4 | 5 | 7 | 4 | 0 |

21. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=3.

Which of the objects will fall into the same cluster as object D?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 4 | 4 | 3 | 5 |
| **B** | 4 | 0 | 1 | 2 | 5 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 5 | 5 | 3 | 4 | 0 |

22. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=2.

Which of the objects will fall into the same cluster as object B?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 5 |
| **B** | 3 | 0 | 1 | 2 | 4 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 5 | 4 | 3 | 4 | 0 |

23. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=6.

Which of the objects will fall into the same cluster as object E?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 10 | 3 | 5 |
| **B** | 3 | 0 | 1 | 2 | 2 |
| **C** | 10 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 6 |
| **E** | 5 | 2 | 3 | 6 | 0 |

24. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=1.

Which of the objects will fall into the same cluster as object B?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 5 |
| **B** | 3 | 0 | 1 | 2 | 1 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 5 | 1 | 3 | 4 | 0 |

25. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=1.

Which of the objects will fall into the same cluster as object C?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 5 |
| **B** | 3 | 0 | 1 | 0 | 1 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 0 | 3 | 0 | 4 |
| **E** | 5 | 1 | 3 | 4 | 0 |

26. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=3.

Which of the objects will fall into the same cluster as object A?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 5 | 3 | 5 |
| **B** | 3 | 0 | 1 | 2 | 5 |
| **C** | 5 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 5 | 5 | 3 | 4 | 0 |

27. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=4.

Which of the objects will fall into the same cluster as object D?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 6 | 4 | 3 | 5 |
| **B** | 6 | 0 | 1 | 2 | 4 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 5 |
| **E** | 5 | 4 | 3 | 5 | 0 |

28. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=2.

Which of the objects will fall into the same cluster as object C?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 5 |
| **B** | 3 | 0 | 1 | 2 | 2 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 3 | 2 | 3 | 0 | 8 |
| **E** | 5 | 2 | 3 | 8 | 0 |

29. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=4.

Which of the objects will fall into the same cluster as object A?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 5 |
| **B** | 3 | 0 | 1 | 2 | 4 |
| **C** | 4 | 1 | 0 | 3 | 3 |
| **D** | 7 | 2 | 3 | 0 | 4 |
| **E** | 5 | 4 | 3 | 4 | 0 |

30. The distances between objects (in some metric) are shown in the table.

It is necessary to represent the data as a graph and perform data clusterization. The number of clusters is not set in advance. The input parameter of the algorithm is R=3,5.

Which of the objects will fall into the same cluster as object E?

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **A** | 0 | 3 | 4 | 3 | 5 |
| **B** | 3 | 0 | 1 | 2 | 5 |
| **C** | 4 | 1 | 0 | 3 | 6 |
| **D** | 3 | 2 | 3 | 0 | 4 |
| **E** | 5 | 1 | 6 | 4 | 0 |

**Task 2**

A table with objects is given.

Split objects into 2 clusters using the k-Means algorithm.

**Variants:**

1.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 2 |
| B | 3 | 2 |
| C | 1 | -1 |
| D | -1 | 1 |
| E | 0 | 4 |

2.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 2 |
| B | 3 | 2 |
| C | 5 | -1 |
| D | -1 | 1 |
| E | 0 | 3 |

3.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 2 |
| B | 3 | 2 |
| C | 1 | -1 |
| D | 1 | 1 |
| E | 1 | 4 |

4.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 8 | 2 |
| B | 3 | 2 |
| C | 1 | -1 |
| D | 2 | 1 |
| E | 1 | 4 |

5.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 2 |
| B | 3 | 2 |
| C | 1 | -1 |
| D | 2 | 1 |
| E | 3 | 5 |

6.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 6 | 2 |
| B | 3 | 1 |
| C | 1 | -1 |
| D | -2 | 1 |
| E | 0 | 1 |

7.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 3 |
| B | 3 | 2 |
| C | 1 | -1 |
| D | 1 | 1 |
| E | 1 | 2 |

8.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 3 | 2 |
| B | 5 | 2 |
| C | 1 | -1 |
| D | 0 | 1 |
| E | 8 | 4 |

9.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 0 | 2 |
| B | 1 | 2 |
| C | 2 | -1 |
| D | -1 | 1 |
| E | 0 | 4 |

10.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 2 |
| B | 3 | 2 |
| C | 6 | -1 |
| D | -3 | 1 |
| E | 5 | 4 |

11.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 3 | 4 |
| B | 1 | 2 |
| C | 1 | 0 |
| D | -1 | 1 |
| E | 0 | 5 |

12.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 2 |
| B | 3 | 2 |
| C | 1 | 1 |
| D | 1 | 2 |
| E | 1 | 5 |

13.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 9 | 2 |
| B | 3 | 8 |
| C | 1 | -1 |
| D | 1 | 1 |
| E | 6 | 4 |

14.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 2 | 2 |
| B | 3 | 2 |
| C | 1 | -1 |
| D | 1 | 1 |
| E | 2 | 4 |

15.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 2 |
| B | 0 | 2 |
| C | 1 | 0 |
| D | 0 | 1 |
| E | 1 | 3 |

16.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 6 | 1 |
| B | 3 | 2 |
| C | 1 | -1 |
| D | 2 | 1 |
| E | 4 | 4 |

17.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 2 |
| B | 3 | 2 |
| C | 1 | 5 |
| D | 3 | 1 |
| E | 1 | 4 |

18.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 7 | 0 |
| B | 3 | 2 |
| C | 1 | -1 |
| D | 1 | 1 |
| E | 4 | 5 |

19.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 2 |
| B | 3 | 2 |
| C | 1 | 1 |
| D | -1 | 0 |
| E | 1 | 2 |

20.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 5 | 6 |
| B | 3 | 2 |
| C | 1 | 0 |
| D | 2 | 6 |
| E | 0 | 4 |

21.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 0 | 2 |
| B | 3 | 3 |
| C | 4 | -1 |
| D | 0 | 1 |
| E | 2 | 4 |

22.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 0 | 2 |
| B | 3 | 2 |
| C | 1 | -2 |
| D | -10 | 5 |
| E | 4 | 4 |

23.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 2 |
| B | 13 | 12 |
| C | 1 | 0 |
| D | 1 | 1 |
| E | 10 | 14 |

24.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 10 | 12 |
| B | 13 | 12 |
| C | 1 | 0 |
| D | 3 | 1 |
| E | 0 | 4 |

25.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 4 | 2 |
| B | 3 | 2 |
| C | 1 | 0 |
| D | 0 | 1 |
| E | 2 | 3 |

26.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 7 | 5 |
| B | 6 | 2 |
| C | 1 | 2 |
| D | 0 | 1 |
| E | 0 | 2 |

27.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 6 | 3 |
| B | 3 | 2 |
| C | 1 | 3 |
| D | 1 | 2 |
| E | 1 | 3 |

28.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 7 | 2 |
| B | 3 | 2 |
| C | 1 | -1 |
| D | 4 | 2 |
| E | 0 | 1 |

29.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 3 | -2 |
| B | 0 | 2 |
| C | 3 | -1 |
| D | 1 | 1 |
| E | 2 | 4 |

30.

|  |  |  |
| --- | --- | --- |
| Object | P1 | P2 |
| А | 0 | 2 |
| B | 3 | 2 |
| C | 1 | 2 |
| D | 4 | 3 |
| E | 5 | 6 |