|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Danzig \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | | Danzig \_algorithm  Single-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Saltation  Linear-rank | Danzig \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Saltation  Linear-rank |
| max | 582 | 593 | 593 | 593 | 589 | 593 | 590 | 593 | 593 | 593 | 591 | 593 | 591 | 593 | 593 | 593 |
| prob. | 0,03 | 0,17 | 0,03 | 0,10 | 0,03 | 0,03 | 0,03 | 0,13 | 0,07 | 0,13 | 0,03 | 0,20 | 0,03 | 0,13 | 0,03 | 0,13 |
| i-avg | 6,43 | 6,07 | 6,73 | 6,80 | 3,03 | 5,37 | 6,67 | 6,80 | 5,20 | 6,10 | 6,50 | 6,93 | 2,10 | 6,17 | 5,50 | 5,70 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Danzig \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Point mutation  Linear-rank | Danzig \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Inversion  Linear-rank | Danzig \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Translocation  Linear-rank | Danzig \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Saltation  Linear-rank | Random \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Single-point crossover  Point mutation  Linear-rank | Random \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Single-point crossover  Inversion  Linear-rank | Random \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Single-point crossover  Translocation  Linear-rank | Random \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Single-point crossover  Saltation  Linear-rank |
| 584 | 593 | 584 | 593 | 584 | 593 | 591 | 593 | 593 | 593 | 593 | 593 | 583 | 593 | 591 | 593 |
| 0,10 | 0,20 | 0,03 | 0,23 | 0,07 | 0,07 | 0,03 | 0,13 | 0,03 | 0,10 | 0,03 | 0,07 | 0,03 | 0,17 | 0,03 | 0,07 |
| 3,60 | 4,87 | 8,43 | 7,07 | 2,23 | 6,47 | 5,70 | 6,10 | 4,37 | 6,57 | 6,73 | 5,47 | 2,10 | 5,80 | 4,33 | 5,97 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Random \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Two-point crossover  Point mutation  Linear-rank | Random \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Two-point crossover  Inversion  Linear-rank | Random \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Two-point crossover  Translocation  Linear-rank | Random \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Two-point crossover  Saltation  Linear-rank | Random \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Random \_algorithm  Uniform crossover  Point mutation  Linear-rank | Random \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Random \_algorithm  Uniform crossover  Inversion  Linear-rank | Random \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Random \_algorithm  Uniform crossover  Translocation  Linear-rank | Random \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Random \_algorithm  Uniform crossover  Saltation  Linear-rank |
| 587 | 593 | 593 | 593 | 589 | 593 | 593 | 593 | 583 | 593 | 584 | 593 | 590 | 593 | 593 | 593 |
| 0,03 | 0,13 | 0,03 | 0,13 | 0,03 | 0,17 | 0,10 | 0,10 | 0,03 | 0,07 | 0,03 | 0,07 | 0,07 | 0,30 | 0,03 | 0,17 |
| 5,77 | 6,00 | 5,30 | 6,20 | 3,40 | 5,90 | 5,30 | 6,17 | 7,23 | 5,80 | 5,03 | 6,30 | 2,53 | 6,17 | 5,13 | 5,57 |

*Задача 9.2.1.1* ▲ *- оптимум* ▲ *- мин. число итераций до локального оптимума* ▲ *- средн. макс. число (*▲ *- средн. мин. число) итераций до локального оптимума*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Danzig \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | | Danzig \_algorithm  Single-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Saltation  Linear-rank | Danzig \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Saltation  Linear-rank |
| max | 689 | 699 | 689 | 699 | 689 | 699 | 689 | 699 | 696 | 699 | 696 | 699 | 699 | 699 | 696 | 699 |
| prob. | 0,03 | 0,07 | 0,03 | 0,27 | 0,03 | 0,17 | 0,07 | 0,10 | 0,03 | 0,10 | 0,03 | 0,23 | 0,03 | 0,13 | 0,03 | 0,10 |
| i-avg | 6,63 | 6,57 | 7,97 | 5,40 | 1,63 | 5,10 | 7,13 | 5,23 | 5,00 | 6,33 | 8,30 | 6,97 | 1,93 | 6,23 | 3,20 | 5,57 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Danzig \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Point mutation  Linear-rank | Danzig \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Inversion  Linear-rank | Danzig \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Translocation  Linear-rank | Danzig \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Saltation  Linear-rank | Random \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Single-point crossover  Point mutation  Linear-rank | Random \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Single-point crossover  Inversion  Linear-rank | Random \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Single-point crossover  Translocation  Linear-rank | Random \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Single-point crossover  Saltation  Linear-rank |
| 699 | 699 | 689 | 699 | 689 | 699 | 696 | 699 | 696 | 699 | 689 | 699 | 689 | 699 | 696 | 699 |
| 0,03 | 0,03 | 0,10 | 0,03 | 0,03 | 0,17 | 0,03 | 0,07 | 0,10 | 0,13 | 0,07 | 0,23 | 0,03 | 0,13 | 0,07 | 0,03 |
| 6,73 | 5,53 | 9,37 | 6,53 | 3,13 | 5,67 | 6,90 | 6,20 | 7,43 | 5,97 | 7,70 | 5,43 | 1,87 | 5,70 | 8,57 | 6,10 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Random \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Two-point crossover  Point mutation  Linear-rank | Random \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Two-point crossover  Inversion  Linear-rank | Random \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Two-point crossover  Translocation  Linear-rank | Random \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Two-point crossover  Saltation  Linear-rank | Random \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Random \_algorithm  Uniform crossover  Point mutation  Linear-rank | Random \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Random \_algorithm  Uniform crossover  Inversion  Linear-rank | Random \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Random \_algorithm  Uniform crossover  Translocation  Linear-rank | Random \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Random \_algorithm  Uniform crossover  Saltation  Linear-rank |
| 696 | 699 | 687 | 696 | 689 | 699 | 687 | 699 | 689 | 699 | 689 | 699 | 699 | 696 | 699 | 699 |
| 0,03 | 0,07 | 0,07 | 0,13 | 0,13 | 0,13 | 0,10 | 0,13 | 0,07 | 0,10 | 0,13 | 0,03 | 0,03 | 0,07 | 0,03 | 0,13 |
| 6,27 | 6,60 | 6,77 | 6,47 | 3,93 | 5,93 | 3,97 | 6,27 | 5,43 | 5,27 | 6,70 | 6,03 | 2,33 | 5,93 | 3,83 | 6,03 |

*Задача 9.2.1. 2* ▲ *- оптимум* ▲ *- мин. число итераций до локального оптимума* ▲ *- средн. макс. число (*▲ *- средн. мин. число) итераций до локального оптимума*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Danzig \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | | Danzig \_algorithm  Single-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Saltation  Linear-rank | Danzig \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Saltation  Linear-rank |
| max | 748 | 748 | 745 | 748 | 743 | 748 | 746 | 748 | 748 | 748 | 748 | 748 | 743 | 748 | 748 | 748 |
| prob. | 0,07 | 0,07 | 0,03 | 0,13 | 0,03 | 0,10 | 0,03 | 0,07 | 0,07 | 0,07 | 0,03 | 0,13 | 0,03 | 0,07 | 0,03 | 0,13 |
| i-avg | 11,1 | 7,37 | 6,40 | 5,23 | 2,23 | 5,03 | 5,27 | 5,70 | 6,90 | 5,80 | 4,20 | 5,87 | 2,80 | 6,60 | 8,37 | 5,83 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Danzig \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Point mutation  Linear-rank | Danzig \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Inversion  Linear-rank | Danzig \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Translocation  Linear-rank | Danzig \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Saltation  Linear-rank | Random \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Single-point crossover  Point mutation  Linear-rank | Random \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Single-point crossover  Inversion  Linear-rank | Random \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Single-point crossover  Translocation  Linear-rank | Random \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Single-point crossover  Saltation  Linear-rank |
| 743 | 748 | 746 | 748 | 746 | 748 | 748 | 746 | 743 | 748 | 743 | 748 | 742 | 748 | 748 | 748 |
| 0,03 | 0,23 | 0,03 | 0,10 | 0,03 | 0,07 | 0,03 | 0,13 | 0,17 | 0,10 | 0,03 | 0,07 | 0,03 | 0,10 | 0,03 | 0,13 |
| 6,00 | 5,23 | 3,67 | 7,03 | 3,27 | 5,73 | 7,73 | 5,60 | 7,77 | 5,33 | 6,03 | 6,20 | 3,17 | 6,00 | 7,23 | 5,10 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Random \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Two-point crossover  Point mutation  Linear-rank | Random \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Two-point crossover  Inversion  Linear-rank | Random \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Two-point crossover  Translocation  Linear-rank | Random \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Two-point crossover  Saltation  Linear-rank | Random \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Random \_algorithm  Uniform crossover  Point mutation  Linear-rank | Random \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Random \_algorithm  Uniform crossover  Inversion  Linear-rank | Random \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Random \_algorithm  Uniform crossover  Translocation  Linear-rank | Random \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Random \_algorithm  Uniform crossover  Saltation  Linear-rank |
| 743 | 748 | 748 | 748 | 748 | 748 | 743 | 748 | 743 | 748 | 748 | 748 | 745 | 748 | 748 | 748 |
| 0,03 | 0,10 | 0,03 | 0,07 | 0,03 | 0,03 | 0,07 | 0,20 | 0,03 | 0,03 | 0,03 | 0,10 | 0,07 | 0,03 | 0,07 | 0,17 |
| 6,97 | 6,67 | 4,37 | 7,10 | 3,53 | 7,83 | 6,43 | 5,00 | 5,97 | 6,00 | 6,00 | 6,47 | 3,40 | 6,33 | 6,37 | 6,00 |

*Задача 9.2.1.3* ▲ *- оптимум* ▲ *- мин. число итераций до локального оптимума* ▲ *- средн. макс. число (*▲ *- средн. мин. число) итераций до локального оптимума*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Danzig \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | | Danzig \_algorithm  Single-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Saltation  Linear-rank | Danzig \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Saltation  Linear-rank |
| max | 817 | 817 | 817 | 817 | 814 | 817 | 808 | 817 | 817 | 817 | 817 | 817 | 817 | 817 | 817 | 817 |
| prob. | 0,03 | 0,33 | 0,03 | 0,17 | 0,03 | 0,23 | 0,03 | 0,33 | 0,03 | 0,17 | 0,07 | 0,30 | 0,07 | 0,23 | 0,03 | 0,23 |
| i-avg | 7,17 | 5,77 | 11,37 | 6,33 | 3,50 | 5,60 | 5,07 | 5,60 | 7,03 | 5,70 | 5,63 | 6,03 | 3,13 | 6,63 | 4,83 | 5,87 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Danzig \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Point mutation  Linear-rank | Danzig \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Inversion  Linear-rank | Danzig \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Translocation  Linear-rank | Danzig \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Saltation  Linear-rank | Random \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Single-point crossover  Point mutation  Linear-rank | Random \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Single-point crossover  Inversion  Linear-rank | Random \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Single-point crossover  Translocation  Linear-rank | Random \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Single-point crossover  Saltation  Linear-rank |
| 817 | 817 | 814 | 817 | 809 | 817 | 817 | 817 | 814 | 817 | 817 | 817 | 814 | 817 | 809 | 817 |
| 0,03 | 0,20 | 0,03 | 0,23 | 0,07 | 0,20 | 0,03 | 0,27 | 0,03 | 0,20 | 0,03 | 0,20 | 0,03 | 0,23 | 0,07 | 0,23 |
| 5,40 | 7,17 | 8,60 | 8,43 | 2,43 | 6,60 | 4,13 | 5,53 | 5,80 | 6,07 | 7,77 | 4,90 | 4,03 | 5,10 | 7,33 | 4,67 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Random \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Two-point crossover  Point mutation  Linear-rank | Random \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Two-point crossover  Inversion  Linear-rank | Random \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Two-point crossover  Translocation  Linear-rank | Random \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Two-point crossover  Saltation  Linear-rank | Random \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Random \_algorithm  Uniform crossover  Point mutation  Linear-rank | Random \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Random \_algorithm  Uniform crossover  Inversion  Linear-rank | Random \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Random \_algorithm  Uniform crossover  Translocation  Linear-rank | Random \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Random \_algorithm  Uniform crossover  Saltation  Linear-rank |
| 817 | 817 | 817 | 817 | 814 | 817 | 817 | 817 | 817 | 817 | 806 | 817 | 817 | 817 | 817 | 817 |
| 0,03 | 0,30 | 0,03 | 0,17 | 0,03 | 0,23 | 0,07 | 0,13 | 0,03 | 0,20 | 0,07 | 0,27 | 0,03 | 0,17 | 0,03 | 0,23 |
| 4,70 | 6,97 | 4,07 | 6,23 | 1,90 | 6,07 | 5,80 | 5,17 | 2,97 | 6,93 | 5,87 | 5,93 | 4,27 | 6,73 | 3,17 | 4,90 |

*Задача 9.2.1.4* ▲ *- оптимум* ▲ *- мин. число итераций до локального оптимума* ▲ *- средн. макс. число (*▲ *- средн. мин. число) итераций до локального оптимума*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Danzig \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | | Danzig \_algorithm  Single-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Saltation  Linear-rank | Danzig \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Saltation  Linear-rank |
| max | 630 | 630 | 620 | 630 | 621 | 630 | 627 | 630 | 621 | 630 | 621 | 630 | 630 | 630 | 630 | 630 |
| prob. | 0,10 | 0,07 | 0,03 | 0,20 | 0,03 | 0,20 | 0,07 | 0,07 | 0,03 | 0,30 | 0,03 | 0,27 | 0,03 | 0,20 | 0,10 | 0,17 |
| i-avg | 12,27 | 7,30 | 4,77 | 7,67 | 3,37 | 5,53 | 6,80 | 6,13 | 11,10 | 6,80 | 2,30 | 5,43 | 2,30 | 6,03 | 8,13 | 5,30 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Danzig \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Point mutation  Linear-rank | Danzig \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Inversion  Linear-rank | Danzig \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Translocation  Linear-rank | Danzig \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Saltation  Linear-rank | Random \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Single-point crossover  Point mutation  Linear-rank | Random \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Single-point crossover  Inversion  Linear-rank | Random \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Single-point crossover  Translocation  Linear-rank | Random \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Single-point crossover  Saltation  Linear-rank |
| 627 | 630 | 630 | 630 | 621 | 630 | 630 | 630 | 630 | 630 | 621 | 630 | 621 | 630 | 620 | 630 |
| 0,03 | 0,07 | 0,07 | 0,17 | 0,03 | 0,17 | 0,03 | 0,30 | 0,03 | 0,03 | 0,03 | 0,03 | 0,03 | 0,13 | 0,03 | 0,10 |
| 4,47 | 6,07 | 3,63 | 6,93 | 2,27 | 6,63 | 5,37 | 6,70 | 10,80 | 6,20 | 7,43 | 6,80 | 3,17 | 6,03 | 4,87 | 6,00 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Random \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Two-point crossover  Point mutation  Linear-rank | Random \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Two-point crossover  Inversion  Linear-rank | Random \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Two-point crossover  Translocation  Linear-rank | Random \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Two-point crossover  Saltation  Linear-rank | Random \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Random \_algorithm  Uniform crossover  Point mutation  Linear-rank | Random \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Random \_algorithm  Uniform crossover  Inversion  Linear-rank | Random \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Random \_algorithm  Uniform crossover  Translocation  Linear-rank | Random \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Random \_algorithm  Uniform crossover  Saltation  Linear-rank |
| 621 | 630 | 630 | 630 | 630 | 630 | 621 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 | 630 |
| 0,03 | 0,20 | 0,03 | 0,10 | 0,03 | 0,13 | 0,03 | 0,13 | 0,07 | 0,13 | 0,03 | 0,07 | 0,03 | 0,27 | 0,03 | 0,10 |
| 5,20 | 8,03 | 5,30 | 6,37 | 2,53 | 5,50 | 5,33 | 6,93 | 7,07 | 5,47 | 8,20 | 6,33 | 2,50 | 7,13 | 6,37 | 5,57 |

*Задача 9.2.1.5* ▲ *- оптимум* ▲ *- мин. число итераций до локального оптимума* ▲ *- средн. макс. число (*▲ *- средн. мин. число) итераций до локального оптимума*

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Danzig \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | | Danzig \_algorithm  Single-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Single-point crossover  Saltation  Linear-rank | Danzig \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Point mutation  Linear-rank | Danzig \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Inversion  Linear-rank | Danzig \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Translocation  Linear-rank | Danzig \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Two-point crossover  Saltation  Linear-rank |
| dev.% | 0 | 0 | 0 | 0 | 0,37 | 0 | 0,27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| prob.(avg) % | 4,00 | 14,00 | 1,33 | 17,33 | 0,67 | 14,67 | 0,67 | 14,00 | 3,33 | 15,33 | 2,00 | 22,67 | 2,67 | 15,33 | 4,00 | 15,33 |
| i-avg | 15,27 | 16,54 | 9,05 | 15,72 | 1,75 | 13,32 | 2,63 | 14,73 | 9,57 | 15,37 | 4,92 | 15,62 | 3,68 | 15,83 | 13,42 | 14,13 |

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| Danzig \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Point mutation  Linear-rank | Danzig \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Inversion  Linear-rank | Danzig \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Translocation  Linear-rank | Danzig \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Danzig \_algorithm  Uniform crossover  Saltation  Linear-rank | Random \_algorithm  Single-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Single-point crossover  Point mutation  Linear-rank | Random \_algorithm  Single-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Single-point crossover  Inversion  Linear-rank | Random \_algorithm  Single-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Single-point crossover  Translocation  Linear-rank | Random \_algorithm  Single-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Single-point crossover  Saltation  Linear-rank |
| 0 | 0 | 0 | 0 | 0,27 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0,37 | 0 | 0 | 0 |
| 1,33 | 14,67 | 1,33 | 15,33 | 0,67 | 13,34 | 2,00 | 15,33 | 1,33 | 11,33 | 1,33 | 12,00 | 0,67 | 15,33 | 0,67 | 11,33 |
| 6,07 | 14,43 | 1,82 | 18,00 | 1,63 | 15,55 | 8,62 | 12,27 | 7,58 | 15,07 | 7,25 | 14,40 | 2,02 | 14,32 | 3,62 | 13,92 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Random \_algorithm  Two-point crossover  Point mutation  Betta-Tournament | Random \_algorithm  Two-point crossover  Point mutation  Linear-rank | Random \_algorithm  Two-point crossover  Inversion  Betta-Tournament | Random \_algorithm  Two-point crossover  Inversion  Linear-rank | Random \_algorithm  Two-point crossover  Translocation  Betta-Tournament | Random \_algorithm  Two-point crossover  Translocation  Linear-rank | Random \_algorithm  Two-point crossover  Saltation  Betta-Tournament | Random \_algorithm  Two-point crossover  Saltation  Linear-rank | Random \_algorithm  Uniform crossover  Point mutation  Betta-Tournament | Random \_algorithm  Uniform crossover  Point mutation  Linear-rank | Random \_algorithm  Uniform crossover  Inversion  Betta-Tournament | Random \_algorithm  Uniform crossover  Inversion  Linear-rank | Random \_algorithm  Uniform crossover  Translocation  Betta-Tournament | Random \_algorithm  Uniform crossover  Translocation  Linear-rank | Random \_algorithm  Uniform crossover  Saltation  Betta-Tournament | Random \_algorithm  Uniform crossover  Saltation  Linear-rank |
| 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 0,67 | 16,00 | 2,66 | 9,33 | 1,33 | 14,00 | 3,33 | 14,00 | 2,00 | 10,67 | 1,33 | 10,67 | 2,00 | 15,33 | 4,00 | 16,00 |
| 2,35 | 17,13 | 9,52 | 12,95 | 3,03 | 15,62 | 5,55 | 14,77 | 5,02 | 14,73 | 7,10 | 15,53 | 4,55 | 13,18 | 12,43 | 14,03 |

*Суммарный отчет для класса тестовых задач с сильной корреляцией* ▲ *– отклонение от оптимума в процентах*