|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 | 563 | 563 | 563 | 563 | 550 | 563 | 563 | 563 | 563 | 563 | 563 | 563 | 562 | 563 | 563 | 563 |
| prob. | 0,10 | 0,23 | 0,03 | 0,20 | 0,07 | 0,23 | 0,07 | 0,27 | 0,03 | 0,40 | 0,07 | 0,37 | 0,03 | 0,30 | 0,07 | 0,47 |
| i-avg | 12,83 | 7,50 | 7,70 | 7,67 | 4,10 | 6,60 | 7,30 | 6,97 | 13,20 | 7,13 | 6,43 | 6,13 | 4,17 | 6,20 | 9,20 | 7,50 |

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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 |
| 563 | 563 | 563 | 563 | 551 | 563 | 563 | 563 | 561 | 563 | 563 | 563 | 561 | 563 | 563 | 563 |
| 0,07 | 0,70 | 0,03 | 0,50 | 0,07 | 0,53 | 0,03 | 0,70 | 0,07 | 0,30 | 0,03 | 0,20 | 0,07 | 0,27 | 0,03 | 0,23 |
| 7,80 | 7,23 | 6,60 | 7,00 | 6,80 | 6,13 | 8,20 | 7,30 | 7,87 | 8,90 | 7,60 | 7,13 | 4,23 | 7,80 | 9,77 | 6,87 |

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |
| 563 | 563 | 563 | 563 | 563 | 563 | 562 | 563 | 563 | 563 | 562 | 563 | 563 | 563 | 563 | 563 |
| 0,03 | 0,43 | 0,07 | 0,23 | 0,03 | 0,43 | 0,03 | 0,17 | 0,03 | 0,37 | 0,10 | 0,60 | 0,03 | 0,50 | 0,03 | 0,53 |
| 7,80 | 7,40 | 5,57 | 6,47 | 3,90 | 6,60 | 7,47 | 7,90 | 10,47 | 7,60 | 5,30 | 7,07 | 3,47 | 7,20 | 4,87 | 7,20 |

*Задача 9.2.1.1* ▲ *- глобальный оптимум* ▲ *- макс. вероятность до глобального оптимума*▲ *- мин. средн. число итераций до глобального 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 | 740 | 740 | 738 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 |
| prob. | 0,13 | 0,63 | 0,07 | 0,43 | 0,03 | 0,30 | 0,03 | 0,53 | 0,10 | 0,57 | 0,03 | 0,50 | 0,03 | 0,50 | 0,10 | 0,60 |
| i-avg | 15,43 | 9,37 | 7,37 | 6,83 | 2,33 | 6,40 | 10,47 | 8,20 | 11,77 | 6,93 | 3,87 | 6,80 | 2,60 | 6,77 | 8,10 | 6,43 |

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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 |
| 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 731 | 740 | 731 | 740 |
| 0,07 | 0,63 | 0,07 | 0,67 | 0,03 | 0,63 | 0,10 | 0,50 | 0,10 | 0,43 | 0,03 | 0,47 | 0,03 | 0,47 | 0,13 | 0,33 |
| 8,23 | 6,73 | 4,63 | 6,73 | 2,93 | 6,40 | 10,70 | 7,47 | 10,57 | 8,33 | 6,27 | 6,83 | 3,67 | 7,73 | 17,07 | 7,93 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |
| 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 740 | 738 | 740 | 740 | 740 | 740 | 740 |
| 0,10 | 0,30 | 0,10 | 0,37 | 0,03 | 0,50 | 0,03 | 0,27 | 0,07 | 0,63 | 0,03 | 0,63 | 0,03 | 0,80 | 0,10 | 0,67 |
| 8,70 | 7,43 | 7,37 | 6,77 | 3,10 | 7,20 | 12,97 | 8,07 | 11,13 | 6,63 | 3,83 | 5,90 | 3,33 | 6,27 | 12,10 | 6,80 |

*Задача 9.2.1. 2* ▲ *- глобальный оптимум* ▲ *- макс. вероятность до глобального оптимума*▲ *- мин. средн. число итераций до глобального 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 | 763 | 763 | 763 | 763 | 736 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 |
| prob. | 0,10 | 0,47 | 0,07 | 0,53 | 0,03 | 0,53 | 0,07 | 0,53 | 0,10 | 0,60 | 0,03 | 0,77 | 0,03 | 0,60 | 0,07 | 0,70 |
| i-avg | 9,93 | 8,17 | 9,13 | 6,17 | 3,83 | 7,80 | 8,20 | 7,80 | 9,20 | 7,97 | 7,60 | 7,97 | 2,63 | 7,60 | 5,53 | 7,93 |

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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 |
| 763 | 763 | 748 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 |
| 0,03 | 0,67 | 0,13 | 0,80 | 0,07 | 0,73 | 0,07 | 0,73 | 0,07 | 0,50 | 0,03 | 0,43 | 0,03 | 0,40 | 0,03 | 0,57 |
| 7,33 | 6,83 | 8,60 | 7,07 | 3,43 | 7,73 | 3,90 | 6,97 | 11,80 | 7,20 | 10,77 | 7,90 | 2,57 | 6,30 | 8,23 | 7,53 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |
| 763 | 763 | 763 | 763 | 763 | 763 | 748 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 | 763 |
| 0,03 | 0,50 | 0,03 | 0,47 | 0,03 | 0,53 | 0,07 | 0,47 | 0,07 | 0,67 | 0,10 | 0,83 | 0,03 | 0,77 | 0,03 | 0,80 |
| 10,13 | 7,63 | 4,90 | 9,80 | 2,23 | 6,93 | 4,80 | 7,87 | 7,63 | 6,40 | 5,20 | 8,33 | 2,57 | 6,60 | 4,50 | 7,03 |

*Задача 9.2.1.3* ▲ *- глобальный оптимум* ▲ *- макс. вероятность до глобального оптимума*▲ *- мин. средн. число итераций до глобального 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 | 786 | 786 | 786 | 786 | 777 | 786 | 786 | 786 | 786 | 786 | 786 | 786 | 768 | 786 | 779 | 786 |
| prob. | 0,03 | 0,43 | 0,07 | 0,43 | 0,03 | 0,37 | 0,03 | 0,50 | 0,07 | 0,63 | 0,13 | 0,43 | 0,07 | 0,47 | 0,03 | 0,47 |
| i-avg | 14,4 | 8,20 | 8,83 | 6,90 | 3,50 | 6,40 | 13,43 | 7,23 | 10,00 | 8,23 | 6,27 | 5,90 | 3,30 | 6,73 | 7,53 | 8,37 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |
| 786 | 786 | 786 | 786 | 786 | 786 | 779 | 786 | 786 | 786 | 768 | 786 | 768 | 786 | 779 | 786 |
| 0,07 | 0,77 | 0,07 | 0,83 | 0,07 | 0,53 | 0,10 | 0,77 | 0,03 | 0,47 | 0,03 | 0,57 | 0,03 | 0,53 | 0,13 | 0,53 |
| 11,73 | 7,93 | 3,77 | 6,87 | 2,60 | 7,33 | 7,53 | 8,73 | 13,93 | 8,10 | 7,30 | 6,33 | 4,13 | 6,83 | 10,97 | 7,83 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |
| 786 | 786 | 786 | 786 | 786 | 786 | 786 | 786 | 786 | 786 | 777 | 786 | 770 | 786 | 779 | 786 |
| 0,03 | 0,53 | 0,03 | 0,40 | 0,03 | 0,40 | 0,03 | 0,40 | 0,03 | 0,67 | 0,07 | 0,57 | 0,03 | 0,67 | 0,07 | 0,67 |
| 5,43 | 6,67 | 8,63 | 6,07 | 3,30 | 7,13 | 7,33 | 7,80 | 8,10 | 7,07 | 6,30 | 6,67 | 2,60 | 7,10 | 10,57 | 6,57 |

*Задача 9.2.1.4* ▲ *- глобальный оптимум* ▲ *- макс. вероятность до глобального оптимума*▲ *- мин. средн. число итераций до глобального 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 | 707 | 707 | 706 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 |
| prob. | 0,03 | 0,43 | 0,07 | 0,30 | 0,03 | 0,30 | 0,03 | 0,20 | 0,07 | 0,53 | 0,07 | 0,53 | 0,03 | 0,50 | 0,03 | 0,60 |
| i-avg | 8,77 | 9,10 | 11,63 | 7,37 | 2,97 | 7,30 | 9,20 | 9,20 | 7,27 | 8,03 | 7,03 | 6,97 | 2,60 | 7,90 | 8,53 | 6,77 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |
| 706 | 707 | 706 | 707 | 706 | 707 | 706 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 |
| 0,03 | 0,83 | 0,07 | 0,67 | 0,07 | 0,87 | 0,10 | 0,73 | 0,13 | 0,33 | 0,07 | 0,27 | 0,03 | 0,17 | 0,03 | 0,23 |
| 7,53 | 7,17 | 5,77 | 6,67 | 2,80 | 6,73 | 10,43 | 6,73 | 10,27 | 7,73 | 6,57 | 6,77 | 2,80 | 6,43 | 5,33 | 7,57 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |
| 707 | 707 | 701 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 707 | 706 | 707 |
| 0,03 | 0,47 | 0,07 | 0,40 | 0,07 | 0,33 | 0,07 | 0,53 | 0,03 | 0,80 | 0,03 | 0,80 | 0,10 | 0,73 | 0,07 | 0,80 |
| 7,67 | 7,97 | 6,67 | 8,17 | 5,03 | 7,00 | 6,20 | 6,50 | 9,50 | 7,23 | 4,03 | 7,27 | 2,87 | 6,70 | 6,73 | 7,20 |

*Задача 9.2.1.5* ▲ *- глобальный оптимум* ▲ *- макс. вероятность до глобального оптимума*▲ *- мин. средн. число итераций до глобального оптимума*

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| prob.(avg) % | 8,00 | 44,00 | 3,33 | 38,00 | 1,33 | 34,67 | 4,67 | 40,67 | 7,33 | 54,67 | 6,67 | 52,00 | 2,00 | 47,33 | 5,33 | 56,67 |
| i-avg | 30,68 | 21,17 | 12,83 | 17,47 | 2,65 | 17,25 | 24,30 | 19,70 | 25,72 | 19,15 | 15,60 | 16,88 | 3,92 | 17,60 | 15,68 | 18,50 |

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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 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 4,67 | 72,00 | 3,33 | 69,33 | 3,33 | 66,00 | 4,00 | 68,67 | 6,67 | 40,67 | 3,33 | 38,67 | 1,33 | 36,67 | 2,00 | 38,00 |
| 17,55 | 17,95 | 7,50 | 17,17 | 4,48 | 17,16 | 11,40 | 18,60 | 23,28 | 20,13 | 15,60 | 17,48 | 2,68 | 17,55 | 11,67 | 18,87 |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 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 |
| 4,66 | 44,67 | 4,67 | 37,33 | 4,00 | 44,00 | 2,67 | 36,67 | 4,67 | 62,67 | 2,67 | 68,67 | 4,00 | 69,33 | 3,33 | 69,33 |
| 19,87 | 18,55 | 13,23 | 18,64 | 8,78 | 17,43 | 13,25 | 19,07 | 23,42 | 17,47 | 4,62 | 17,62 | 6,12 | 16,93 | 10,73 | 17,40 |

*Суммарный отчет для класса тестовых задач без корреляции* ▲ *– отклонение от оптимума в процентах,* ▲ *– максимальная средняя вероятность*