




CSES Problem Set

TASKS | [STATISTICS](#) | [HACKS](#)




General

-
-  [Introduction](#)
 -  [Create new account](#)
 -  [Statistics](#)
-

Introductory Problems





| | | |
|---|-----------------|---|
|  Weird Algorithm | 105483 / 110464 | - |
|  Missing Number | 89957 / 94819 | - |
|  Repetitions | 78576 / 82261 | - |
|  Increasing Array | 73566 / 76589 | - |
|  Permutations | 64713 / 66871 | - |
|  Number Spiral | 45950 / 50090 | - |
|  Two Knights | 34438 / 35646 | - |
|  Two Sets | 37226 / 40441 | - |
|  Bit Strings | 43281 / 45714 | - |
|  Trailing Zeros | 40474 / 43255 | - |
|  Coin Piles | 35755 / 39443 | - |
|  Palindrome Reorder | 32812 / 34902 | - |
|  Gray Code | 20624 / 23509 | - |
|  Tower of Hanoi | 19170 / 19984 | - |
|  Creating Strings | 28183 / 29020 | - |
|  Apple Division | 27485 / 31418 | - |
|  Chessboard and Queens | 16343 / 16679 | - |
|  Digit Queries | 11229 / 13456 | - |
|  Grid Paths | 6761 / 8680 | - |

Sorting and Searching

| | | |
|--|---------------|---|
|  Distinct Numbers | 50010 / 54677 | - |
|  Apartments | 36592 / 41442 | - |
|  Ferris Wheel | 34895 / 38083 | - |

| | | |
|--|---------------|---|
|  Concert Tickets | 28110 / 33374 | - |
|  Restaurant Customers | 28866 / 31444 | - |
|  Movie Festival | 27161 / 28996 | - |
|  Sum of Two Values | 32006 / 36387 | - |
|  Maximum Subarray Sum | 31421 / 33007 | - |
|  Stick Lengths | 27834 / 29418 | - |
|  Missing Coin Sum | 19785 / 20587 | - |
|  Collecting Numbers | 20421 / 22073 | - |
|  Collecting Numbers II | 8142 / 10664 | - |
|  Playlist | 21117 / 24529 | - |
|  Towers | 21524 / 23265 | - |
|  Traffic Lights | 16848 / 18972 | - |
|  Josephus Problem I | 11737 / 13246 | - |
|  Josephus Problem II | 6676 / 8859 | - |
|  Nested Ranges Check | 6666 / 7815 | - |
|  Nested Ranges Count | 4686 / 5462 | - |
|  Room Allocation | 12346 / 14335 | - |
|  Factory Machines | 16131 / 18032 | - |
|  Tasks and Deadlines | 14278 / 14611 | - |
|  Reading Books | 11405 / 12253 | - |
|  Sum of Three Values | 16780 / 18961 | - |
|  Sum of Four Values | 10575 / 11908 | - |
|  Nearest Smaller Values | 14046 / 14584 | - |
|  Subarray Sums I | 18343 / 19671 | - |
|  Subarray Sums II | 15490 / 19348 | - |
|  Subarray Divisibility | 14951 / 16441 | - |
|  Subarray Distinct Values | 8641 / 9343 | - |
|  Array Division | 13650 / 14467 | - |
|  Sliding Window Median | 9074 / 10377 | - |
|  Sliding Window Cost | 6223 / 7181 | - |
|  Movie Festival II | 7680 / 9309 | - |
|  Maximum Subarray Sum II | 6989 / 8460 | - |
















Dynamic Programming

| | | |
|--|---------------|---|
|  Dice Combinations | 50423 / 53667 | - |
|  Minimizing Coins | 43557 / 47077 | - |
|  Coin Combinations I | 39938 / 43555 | - |
|  Coin Combinations II | 33611 / 38531 | - |

| | | |
|--|---------------|---|
|  Removing Digits | 37205 / 38118 | - |
|  Grid Paths | 35333 / 36491 | - |
|  Book Shop | 31183 / 34789 | - |
|  Array Description | 22599 / 25444 | - |
|  Counting Towers | 13150 / 13963 | - |
|  Edit Distance | 23336 / 24780 | - |
|  Rectangle Cutting | 19440 / 21316 | - |
|  Money Sums | 23298 / 24325 | - |
|  Removal Game | 16776 / 18620 | - |
|  Two Sets II | 18354 / 20047 | - |
|  Increasing Subsequence | 18852 / 21395 | - |
|  Projects | 12730 / 14436 | - |
|  Elevator Rides | 7722 / 9921 | - |
|  Counting Tilings | 4414 / 4861 | - |
|  Counting Numbers | 5908 / 6820 | - |

Graph Algorithms

| | | |
|--|---------------|---|
|  Counting Rooms | 34295 / 36393 | - |
|  Labyrinth | 22732 / 28176 | - |
|  Building Roads | 29819 / 31067 | - |
|  Message Route | 25388 / 26615 | - |
|  Building Teams | 23920 / 25593 | - |
|  Round Trip | 18966 / 20917 | - |
|  Monsters | 12159 / 14900 | - |
|  Shortest Routes I | 20404 / 23180 | - |
|  Shortest Routes II | 16317 / 18899 | - |
|  High Score | 8967 / 14261 | - |
|  Flight Discount | 12319 / 14968 | - |
|  Cycle Finding | 8992 / 11308 | - |
|  Flight Routes | 8458 / 9528 | - |
|  Round Trip II | 10079 / 11560 | - |
|  Course Schedule | 13388 / 14554 | - |
|  Longest Flight Route | 8790 / 11665 | - |
|  Game Routes | 10223 / 11197 | - |
|  Investigation | 7523 / 8174 | - |
|  Planets Queries I | 6366 / 7690 | - |
|  Planets Queries II | 2444 / 3043 | - |
|  Planets Cycles | 4157 / 4675 | - |

| | | |
|--|---------------|---|
|  Road Reparation | 10028 / 10523 | - |
|  Road Construction | 10655 / 11063 | - |
|  Flight Routes Check | 9035 / 9955 | - |
|  Planets and Kingdoms | 7282 / 7582 | - |
|  Giant Pizza | 2974 / 3341 | - |
|  Coin Collector | 4498 / 5109 | - |
|  Mail Delivery | 3888 / 4311 | - |
|  De Bruijn Sequence | 2067 / 2173 | - |
|  Teleporters Path | 2956 / 3430 | - |
|  Hamiltonian Flights | 4384 / 4998 | - |
|  Knight's Tour | 1785 / 2117 | - |
|  Download Speed | 3042 / 4181 | - |
|  Police Chase | 2379 / 2725 | - |
|  School Dance | 2616 / 2796 | - |
|  Distinct Routes | 1707 / 2327 | - |

Range Queries












| | | |
|---|---------------|---|
|  Static Range Sum Queries | 23383 / 24459 | - |
|  Static Range Minimum Queries | 17355 / 18580 | - |
|  Dynamic Range Sum Queries | 17928 / 18757 | - |
|  Dynamic Range Minimum Queries | 16353 / 16782 | - |
|  Range XOR Queries | 16629 / 16878 | - |
|  Range Update Queries | 13131 / 14224 | - |
|  Forest Queries | 12916 / 13445 | - |
|  Hotel Queries | 9297 / 10026 | - |
|  List Removals | 7865 / 8300 | - |
|  Salary Queries | 5797 / 7079 | - |
|  Prefix Sum Queries | 4714 / 5166 | - |
|  Pizzeria Queries | 3835 / 3985 | - |
|  Subarray Sum Queries | 4873 / 5414 | - |
|  Distinct Values Queries | 4519 / 5510 | - |
|  Increasing Array Queries | 1641 / 1893 | - |
|  Forest Queries II | 3075 / 3336 | - |
|  Range Updates and Sums | 3735 / 4578 | - |
|  Polynomial Queries | 2839 / 3349 | - |
|  Range Queries and Copies | 1982 / 2150 | - |

Tree Algorithms

| | | |
|---|---------------|---|
|  Subordinates | 19544 / 21118 | - |
|  Tree Matching | 10951 / 12900 | - |
|  Tree Diameter | 16194 / 17315 | - |
|  Tree Distances I | 12027 / 13048 | - |
|  Tree Distances II | 9874 / 10307 | - |
|  Company Queries I | 10885 / 11537 | - |
|  Company Queries II | 10209 / 10773 | - |
|  Distance Queries | 9449 / 10157 | - |
|  Counting Paths | 5682 / 6099 | - |
|  Subtree Queries | 6987 / 7480 | - |
|  Path Queries | 5534 / 5850 | - |
|  Path Queries II | 1997 / 3255 | - |
|  Distinct Colors | 5263 / 5918 | - |
|  Finding a Centroid | 4361 / 4556 | - |
|  Fixed-Length Paths I | 1853 / 2603 | - |
|  Fixed-Length Paths II | 781 / 1746 | - |

Mathematics







| | | |
|--|---------------|---|
|  Josephus Queries | 2810 / 3556 | - |
|  Exponentiation | 16046 / 17328 | - |
|  Exponentiation II | 11515 / 14144 | - |
|  Counting Divisors | 14150 / 16181 | - |
|  Common Divisors | 9498 / 11329 | - |
|  Sum of Divisors | 5323 / 8162 | - |
|  Divisor Analysis | 3486 / 4658 | - |
|  Prime Multiples | 3850 / 4547 | - |
|  Counting Coprime Pairs | 2404 / 2845 | - |
|  Binomial Coefficients | 6509 / 7376 | - |
|  Creating Strings II | 5515 / 5893 | - |
|  Distributing Apples | 5366 / 5826 | - |
|  Christmas Party | 4133 / 4493 | - |
|  Bracket Sequences I | 2830 / 3136 | - |
|  Bracket Sequences II | 1458 / 1688 | - |
|  Counting Necklaces | 1397 / 1530 | - |
|  Counting Grids | 1126 / 1205 | - |
|  Fibonacci Numbers | 4732 / 6071 | - |
|  Throwing Dice | 2550 / 2772 | - |
|  Graph Paths I | 2335 / 2523 | - |

| | | |
|---|-------------|---|
|  Graph Paths II | 1969 / 2063 | - |
|  Dice Probability | 2192 / 2356 | - |
|  Moving Robots | 1112 / 1186 | - |
|  Candy Lottery | 1728 / 1776 | - |
|  Inversion Probability | 540 / 1541 | - |
|  Stick Game | 2304 / 2366 | - |
|  Nim Game I | 2925 / 3054 | - |
|  Nim Game II | 2371 / 2479 | - |
|  Stair Game | 1630 / 1790 | - |
|  Grundy's Game | 1062 / 1362 | - |
|  Another Game | 1224 / 1335 | - |

String Algorithms

| | | |
|--|--------------|---|
|  Word Combinations | 3547 / 5388 | - |
|  String Matching | 7050 / 10041 | - |
|  Finding Borders | 5230 / 5824 | - |
|  Finding Periods | 3634 / 4139 | - |
|  Minimal Rotation | 1784 / 2885 | - |
|  Longest Palindrome | 2669 / 3739 | - |
|  Required Substring | 1011 / 1641 | - |
|  Palindrome Queries | 1290 / 1540 | - |
|  Finding Patterns | 1126 / 1650 | - |
|  Counting Patterns | 1024 / 1335 | - |
|  Pattern Positions | 886 / 1120 | - |
|  Distinct Substrings | 1084 / 1303 | - |
|  Repeating Substring | 1128 / 1280 | - |
|  String Functions | 1025 / 1083 | - |
|  Substring Order I | 791 / 852 | - |
|  Substring Order II | 492 / 632 | - |
|  Substring Distribution | 680 / 740 | - |










Geometry

| | | |
|--|-------------|---|
|  Point Location Test | 4611 / 5290 | - |
|  Line Segment Intersection | 2775 / 3626 | - |
|  Polygon Area | 3315 / 3557 | - |
|  Point in Polygon | 1818 / 2315 | - |
|  Polygon Lattice Points | 1548 / 1609 | - |
|  Minimum Euclidean Distance | 1291 / 1920 | - |

Advanced Techniques

| | | | |
|---|--------------------------------------|-------------|---|
|  | Meet in the Middle | 4048 / 6140 | - |
|  | Hamming Distance | 2152 / 2346 | - |
|  | Beautiful Subgrids | 1523 / 1712 | - |
|  | Reachable Nodes | 1527 / 1652 | - |
|  | Reachability Queries | 1041 / 1243 | - |
|  | Cut and Paste | 995 / 1119 | - |
|  | Substring Reversals | 875 / 959 | - |
|  | Reversals and Sums | 877 / 964 | - |
|  | Necessary Roads | 1322 / 1360 | - |
|  | Necessary Cities | 1226 / 1293 | - |
|  | Eulerian Subgraphs | 546 / 577 | - |
|  | Monster Game I | 784 / 868 | - |
|  | Monster Game II | 701 / 759 | - |
|  | Subarray Squares | 806 / 951 | - |
|  | Houses and Schools | 512 / 596 | - |
|  | Knuth Division | 593 / 676 | - |
|  | Apples and Bananas | 564 / 622 | - |
|  | One Bit Positions | 537 / 598 | - |
|  | Signal Processing | 500 / 545 | - |
|  | New Roads Queries | 1327 / 1624 | - |
|  | Dynamic Connectivity | 601 / 686 | - |
|  | Parcel Delivery | 463 / 528 | - |
|  | Task Assignment | 462 / 504 | - |
|  | Distinct Routes II | 372 / 434 | - |

Additional Problems

| | | | |
|---|--|-------------|---|
|  | Shortest Subsequence | 2086 / 2777 | - |
|  | Counting Bits | 2468 / 3163 | - |
|  | Swap Game | 1381 / 1765 | - |
|  | Prüfer Code | 952 / 1050 | - |
|  | Acyclic Graph Edges | 1503 / 1601 | - |
|  | Strongly Connected Edges | 957 / 1050 | - |
|  | Even Outdegree Edges | 864 / 1005 | - |
|  | Multiplication Table | 3387 / 3861 | - |
|  | Advertisement | 2807 / 2984 | - |

| | | |
|---|-------------|---|
|  Special Substrings | 633 / 686 | - |
|  Permutation Inversions | 689 / 760 | - |
|  Maximum Xor Subarray | 1575 / 1724 | - |
|  Movie Festival Queries | 694 / 782 | - |
|  Chess Tournament | 784 / 895 | - |
|  Tree Traversals | 749 / 838 | - |
|  Network Renovation | 660 / 873 | - |
|  Graph Girth | 2085 / 2430 | - |
|  Intersection Points | 1254 / 1358 | - |
|  Inverse Inversions | 699 / 733 | - |
|  Monotone Subsequences | 464 / 518 | - |
|  String Reorder | 537 / 593 | - |
|  Stack Weights | 418 / 487 | - |
|  Pyramid Array | 522 / 626 | - |
|  Increasing Subsequence II | 1596 / 1728 | - |
|  String Removals | 680 / 737 | - |
|  Bit Inversions | 1626 / 1884 | - |
|  Xor Pyramid | 951 / 1205 | - |
|  Writing Numbers | 539 / 584 | - |
|  String Transform | 343 / 427 | - |
|  Letter Pair Move Game | 126 / 185 | - |
|  Maximum Building I | 1441 / 1507 | - |
|  Sorting Methods | 594 / 636 | - |
|  Cyclic Array | 723 / 827 | - |
|  List of Sums | 317 / 426 | - |
|  Increasing Array II | 553 / 633 | - |
|  Food Division | 382 / 455 | - |
|  Bit Problem | 1100 / 1185 | - |
|  Swap Round Sorting | 304 / 375 | - |
|  Binary Subsequences | 172 / 267 | - |
|  Tree Isomorphism I | 720 / 837 | - |
|  Counting Sequences | 405 / 444 | - |
|  Critical Cities | 275 / 424 | - |
|  School Excursion | 931 / 994 | - |
|  Coin Grid | 506 / 604 | - |
|  Robot Path | 208 / 358 | - |
|  Programmers and Artists | 339 / 436 | - |
|  Course Schedule II | 1122 / 1597 | - |
|  Removing Digits II | 136 / 294 | - |

| | | |
|---|-------------|---|
|  Coin Arrangement | 222 / 296 | - |
|  Counting Bishops | 238 / 270 | - |
|  Grid Puzzle I | 358 / 392 | - |
|  Grid Puzzle II | 268 / 302 | - |
|  Empty String | 1020 / 1220 | - |
|  Grid Paths | 525 / 659 | - |
|  Bit Substrings | 253 / 313 | - |
|  Reversal Sorting | 233 / 286 | - |
|  Counting Reorders | 134 / 205 | - |
|  Book Shop II | 697 / 806 | - |
|  Network Breakdown | 658 / 701 | - |
|  Visiting Cities | 476 / 627 | - |
|  Missing Coin Sum Queries | 274 / 368 | - |
|  Number Grid | 614 / 739 | - |
|  Maximum Building II | 302 / 373 | - |
|  Filling Trominos | 145 / 246 | - |
|  Stick Divisions | 2597 / 3073 | - |
|  Coding Company | 966 / 1238 | - |
|  Flight Route Requests | 312 / 380 | - |
|  Two Stacks Sorting | 100 / 340 | - |
|  Tree Isomorphism II | 592 / 686 | - |
|  Forbidden Cities | 492 / 647 | - |
|  Area of Rectangles | 720 / 813 | - |
|  Grid Completion | 137 / 182 | - |
|  Creating Offices | 269 / 349 | - |
|  Permutations II | 610 / 699 | - |
|  Functional Graph Distribution | 151 / 190 | - |
|  New Flight Routes | 227 / 532 | - |
|  Grid Path Construction | 69 / 269 | - |