

#### **CSES Problem Set**

TASKS | STATISTICS

#### **General**

<u>Introduction</u>	
Create new account	
Statistics	

#### **Introductory Problems**

Weird Algorithm	54108 / 56459
Missing Number	45914 / 48593
<u>Repetitions</u>	40322 / 42456
Increasing Array	37211 / 38800
<u>Permutations</u>	33060 / 34195
Number Spiral	23354 / 25452
Two Knights	17464 / 18058
Two Sets	18787 / 20393
Bit Strings	22255 / 23528
<u>Trailing Zeros</u>	21040 / 22458
Coin Piles	18325 / 20203
Palindrome Reorder	16389 / 17470
Gray Code	8922 / 10132
Tower of Hanoi	8237 / 8590
<u>Creating Strings</u>	14550 / 15005
Apple Division	13485 / 15547
Chessboard and Queens	8121 / 8275
<u>Digit Queries</u>	4650 / 5709
Grid Paths	3355 / 4341

#### **Sorting and Searching**

<u>Distinct Numbers</u>	25338 / 26260
<u>Apartments</u>	17420 / 19965
Ferris Wheel	16440 / 18126

Concert Tickets	12955 / 15756
Restaurant Customers	13369 / 14642
Movie Festival	12785 / 13620
Sum of Two Values	15199 / 16784
Maximum Subarray Sum	14607 / 15470
Stick Lengths	12960 / 13767
Missing Coin Sum	7837 / 8161
Collecting Numbers	8136 / 8831
Collecting Numbers II	3299 / 4297
<u>Playlist</u>	10073 / 11555
<u>Towers</u>	10285 / 11140
<u>Traffic Lights</u>	7953 / 8953
<u>Josephus Problem I</u>	4524 / 5177
Josephus Problem II	2720 / 3501
Nested Ranges Check	2362 / 2861
Nested Ranges Count	1805 / 2090
Room Allocation	5979 / 7066
Factory Machines	7159 / 7742
Tasks and Deadlines	6944 / 7109
Reading Books	5560 / 5965
Sum of Three Values	7865 / 8798
Sum of Four Values	5294 / 5886
Nearest Smaller Values	6637 / 6912
Subarray Sums I	8160 / 8896
Subarray Sums II	7639 / 8492
Subarray Divisibility	6845 / 7425
Subarray Distinct Values	3285 / 3527
Array Division	5722 / 6082
Sliding Median	4194 / 4864
Sliding Cost	2886 / 3279
Movie Festival II	3567 / 4325
Maximum Subarray Sum II	3315 / 3946

# **Dynamic Programming**

Dice Combinations	23186 / 24715
Minimizing Coins	20204 / 21588
Coin Combinations I	18788 / 20291
Coin Combinations II	15933 / 18076

Removing Digits	17516 / 17842
Grid Paths	16373 / 16900
Book Shop	14767 / 16352
Array Description	10476 / 11742
Counting Towers	4893 / 5202
Edit Distance	10902 / 11641
Rectangle Cutting	9251 / 10130
Money Sums	10864 / 11338
Removal Game	7879 / 8557
Two Sets II	8764 / 9520
Increasing Subsequence	8922 / 10207
<u>Projects</u>	5761 / 6557
Elevator Rides	2998 / 3910
Counting Tilings	1699 / 1871
Counting Numbers	2146 / 2411

# **Graph Algorithms**

Counting Rooms	16128 / 17175
<u>Labyrinth</u>	10329 / 12814
Building Roads	13438 / 14023
Message Route	11447 / 11984
Building Teams	11073 / 11628
Round Trip	8848 / 9804
<u>Monsters</u>	5087 / 6417
Shortest Routes I	9255 / 10342
Shortest Routes II	7767 / 8453
<u>High Score</u>	4559 / 6352
Flight Discount	4950 / 6317
Cycle Finding	4278 / 5078
Flight Routes	3597 / 4086
Round Trip II	4406 / 5088
Course Schedule	6066 / 6316
Longest Flight Route	3942 / 5096
Game Routes	4390 / 4854
<u>Investigation</u>	3098 / 3354
<u>Planets Queries I</u>	2654 / 3253
<u>Planets Queries II</u>	1170 / 1422
<u>Planets Cycles</u>	1796 / 2000

Road Reparation	4144 / 4314
Road Construction	4317 / 4492
Flight Routes Check	3799 / 4196
Planets and Kingdoms	3089 / 3224
Giant Pizza	1334 / 1476
Coin Collector	1957 / 2166
Mail Delivery	1716 / 1936
De Bruijn Sequence	959 / 1000
<u>Teleporters Path</u>	1344 / 1544
Hamiltonian Flights	1638 / 1898
Knight's Tour	851 / 1011
<u>Download Speed</u>	1715 / 1883
Police Chase	1185 / 1309
School Dance	1253 / 1310
<u>Distinct Routes</u>	764 / 1041

## **Range Queries**

Static Range Sum Queries	10648 / 11126
Static Range Minimum Queries	8116 / 8671
Dynamic Range Sum Queries	8318 / 8728
Dynamic Range Minimum Queries	7417 / 7618
Range Xor Queries	7410 / 7519
Range Update Queries	5975 / 6400
Forest Queries	5577 / 5803
Hotel Queries	4292 / 4572
<u>List Removals</u>	3568 / 3773
Salary Queries	2685 / 3202
Prefix Sum Queries	1824 / 1982
<u>Pizzeria Queries</u>	1483 / 1538
Subarray Sum Queries	2276 / 2465
<u>Distinct Values Queries</u>	2192 / 2581
Increasing Array Queries	683 / 800
Forest Queries II	1566 / 1671
Range Updates and Sums	1671 / 2047
Polynomial Queries	1338 / 1579
Range Queries and Copies	883 / 937

### **Tree Algorithms**

<u>Subordinates</u>	8972 / 9581
<u>Tree Matching</u>	4787 / 5763
<u>Tree Diameter</u>	7351 / 7799
<u>Tree Distances I</u>	5099 / 5583
<u>Tree Distances II</u>	4217 / 4412
Company Queries I	4655 / 4954
Company Queries II	4426 / 4637
<u>Distance Queries</u>	4290 / 4581
Counting Paths	2421 / 2578
Subtree Queries	3098 / 3323
Path Queries	2384 / 2517
Path Queries II	999 / 1168
<u>Distinct Colors</u>	2270 / 2602
<u>Finding a Centroid</u>	1637 / 1701
<u>Fixed-Length Paths I</u>	805 / 904
<u>Fixed-Length Paths II</u>	616 / 670

#### **Mathematics**

Josephus Queries	979 / 1270
<u>Exponentiation</u>	7566 / 8286
Exponentiation II	5415 / 6705
Counting Divisors	6197 / 7114
Common Divisors	3954 / 5031
Sum of Divisors	2458 / 3900
<u>Divisor Analysis</u>	1296 / 1725
Prime Multiples	1315 / 1583
Counting Coprime Pairs	879 / 1041
Binomial Coefficients	2883 / 3280
<u>Creating Strings II</u>	2456 / 2653
<u>Distributing Apples</u>	2314 / 2486
<u>Christmas Party</u>	1969 / 2150
Bracket Sequences I	1107 / 1231
Bracket Sequences II	529 / 625
Counting Necklaces	549 / 595
Counting Grids	434 / 467
<u>Fibonacci Numbers</u>	2416 / 3093
Throwing Dice	1360 / 1480
<u>Graph Paths I</u>	1183 / 1276

<u>Graph Paths II</u>	994 / 1037
<u>Dice Probability</u>	1168 / 1241
Moving Robots	599 / 638
Candy Lottery	875 / 902
Inversion Probability	775 / 795
Stick Game	1152 / 1182
Nim Game I	1455 / 1508
Nim Game II	1161 / 1215
Stair Game	801 / 890
Grundy's Game	411 / 527
Another Game	423 / 464

## **String Algorithms**

Word Combinations	1450 / 2262
String Matching	3168 / 4185
<u>Finding Borders</u>	2063 / 2327
<u>Finding Periods</u>	1346 / 1558
Minimal Rotation	908 / 1350
<u>Longest Palindrome</u>	1159 / 1627
Required Substring	515 / 854
Palindrome Queries	438 / 535
<u>Finding Patterns</u>	412 / 611
<u>Counting Patterns</u>	399 / 511
<u>Pattern Positions</u>	347 / 421
<u>Distinct Substrings</u>	382 / 457
Repeating Substring	362 / 392
String Functions	382 / 401
Substring Order I	284 / 306
Substring Order II	200 / 238
Substring Distribution	270 / 290

### **Geometry**

Point Location Test	1889 / 2097
Line Segment Intersection	1131 / 1431
<u>Polygon Area</u>	1349 / 1409
Point in Polygon	700 / 905
Polygon Lattice Points	608 / 630
Minimum Euclidean Distance	590 / 796

<u>Convex Hull</u> 847 / 1052

### **Advanced Techniques**

Meet in the Middle	1721 / 2499
Hamming Distance	844 / 927
Beautiful Subgrids	550 / 625
Reachable Nodes	538 / 585
Reachability Queries	411 / 478
Cut and Paste	370 / 423
Substring Reversals	307 / 329
Reversals and Sums	302 / 330
Necessary Roads	475 / 484
Necessary Cities	425 / 448
Eulerian Subgraphs	234 / 246
Monster Game I	300 / 325
Monster Game II	281 / 298
Subarray Squares	266 / 324
Houses and Schools	183 / 202
Knuth Division	224 / 256
<u>Apples and Bananas</u>	224 / 244
One Bit Positions	207 / 233
<u>Signal Processing</u>	195 / 206
New Roads Queries	418 / 528
<u>Dynamic Connectivity</u>	190 / 206
Parcel Delivery	175 / 202
<u>Task Assignment</u>	178 / 189
Distinct Routes II	148 / 170

#### **Additional Problems**

1117 / 1465
1263 / 1643
594 / 787
509 / 542
712 / 760
339 / 375
340 / 394
906 / 1002
1121 / 1183

Special Substrings	244 / 268
Permutation Inversions	284 / 312
Maximum Xor Subarray	759 / 824
Movie Festival Queries	351 / 401
Chess Tournament	415 / 473
<u>Tree Traversals</u>	389 / 431
Network Renovation	319 / 443
Graph Girth	921 / 1035
Intersection Points	555 / 604
Inverse Inversions	268 / 281
Monotone Subsequences	180 / 198
String Reorder	278 / 308
Stack Weights	151 / 183
<u>Pyramid Array</u>	281 / 335
Increasing Subsequence II	731 / 785
String Removals	378 / 416
Bit Inversions	786 / 874
Xor Pyramid	349 / 445
Writing Numbers	304 / 330
String Transform	197 / 238
<u>Letter Pair Move Game</u>	50 / 78
<u>Maximum Building I</u>	683 / 709
Sorting Methods	318 / 341
Cyclic Array	265 / 327
<u>List of Sums</u>	155 / 210
<u>Increasing Array II</u>	225 / 250
Food Division	213 / 252
<u>Bit Problem</u>	421 / 457
Swap Round Sorting	150 / 194
Binary Subsequences	73 / 114
Tree Isomorphism I	306 / 370
<u>Counting Sequences</u>	173 / 184
<u>Critical Cities</u>	135 / 209
School Excursion	422 / 450
Coin Grid	241 / 281
Robot Path	118 / 206
<u>Programmers and Artists</u>	123 / 156
Course Schedule II	514 / 733
Removing Digits II	65 / 114

Coin Arrangement	97 / 130
Counting Bishops	89 / 99
Grid Puzzle I	143 / 160
Grid Puzzle II	98 / 112
Empty String	471 / 571
Grid Paths	288 / 364
Bit Substrings	107 / 140
Reversal Sorting	89 / 113
Counting Reorders	56 / 81
Book Shop II	328 / 373
Network Breakdown	305 / 321
<u>Visiting Cities</u>	240 / 315
Missing Coin Sum Queries	94 / 139
Number Grid	346 / 415
Maximum Building II	188 / 228
Filling Trominos	60 / 91
Stick Divisions	995 / 1185
Coding Company	410 / 534
Flight Route Requests	171 / 195
Two Stacks Sorting	36 / 145
Tree Isomorphism II	266 / 300
<u>Forbidden Cities</u>	205 / 262
Area of Rectangles	331 / 376
Grid Completion	50 / 72
<u>Creating Offices</u>	137 / 185
Permutations II	322 / 360
Functional Graph Distribution	68 / 80
New Flight Routes	140 / 289
Grid Path Construction	28 / 79