

Golomb Ruler

Golmb Ruler 8-34

Using Tabu List (no communication)

Without Tabu List (no communication)

Eps = 4

Norm = 8

tabu size = 15

| time | iterations | restarts |
|-----------|------------|----------|
| 110 | 743 | 3 |
| 100 | 768 | 3 |
| 50 | 518 | 2 |
| 20 | 88 | 0 |
| 20 | 202 | 1 |
| 30 | 233 | 1 |
| 20 | 197 | 0 |
| 10 | 112 | 0 |
| 20 | 86 | 0 |
| 40 | 229 | 1 |
| 10 | 88 | 0 |
| 20 | 88 | 0 |
| 20 | 89 | 0 |
| 100 | 970 | 4 |
| 30 | 173 | 0 |
| 40 | 401 | 2 |
| 20 | 169 | 0 |
| 30 | 173 | 0 |
| 30 | 196 | 0 |
| 170 | 1543 | 7 |
| 90 | 576 | 2 |
| 60 | 602 | 3 |
| 60 | 570 | 2 |
| 60 | 547 | 2 |
| 10 | 86 | 0 |
| 10 | 138 | 0 |
| 20 | 142 | 0 |
| 10 | 87 | 0 |
| 50 | 487 | 2 |
| 20 | 167 | 0 |
| 43 | 349 | 1 |
| 38 | 334 | 2 |

| time | iterations | restarts |
|-----------|------------|----------|
| 70 | 685 | 3 |
| 50 | 432 | 2 |
| 50 | 400 | 1 |
| 90 | 801 | 4 |
| 50 | 371 | 1 |
| 60 | 603 | 3 |
| 110 | 1118 | 5 |
| 30 | 286 | 1 |
| 40 | 378 | 1 |
| 30 | 315 | 1 |
| 30 | 259 | 1 |
| 50 | 431 | 2 |
| 20 | 204 | 1 |
| 130 | 1290 | 6 |
| 100 | 961 | 4 |
| 60 | 604 | 3 |
| 20 | 263 | 1 |
| 20 | 194 | 0 |
| 10 | 112 | 0 |
| 30 | 290 | 1 |
| 20 | 166 | 0 |
| 40 | 343 | 1 |
| 10 | 114 | 0 |
| 140 | 1200 | 5 |
| 30 | 259 | 1 |
| 20 | 203 | 1 |
| 40 | 260 | 1 |
| 10 | 88 | 0 |
| 20 | 202 | 1 |
| 40 | 259 | 1 |
| 47 | 436 | 2 |
| 35 | 330 | 2 |

Golomb Ruler

Golmb Ruler 10-55

Using Tabu List (no communication)

Without Tabu List (no communication)

Eps = 4

Norm = 8

tabu size = 15

| time | iterations | restarts |
|--------------|---------------|-----------|
| 4740 | 20069 | 13 |
| 13990 | 56986 | 37 |
| 7980 | 33958 | 22 |
| 6810 | 28162 | 18 |
| 9300 | 37336 | 24 |
| 21410 | 89951 | 59 |
| 3340 | 13506 | 9 |
| 3190 | 13458 | 8 |
| 1230 | 4449 | 2 |
| 2320 | 9792 | 6 |
| 5520 | 23529 | 15 |
| 4330 | 17268 | 11 |
| 3170 | 12892 | 8 |
| 1050 | 3734 | 2 |
| 8090 | 34830 | 23 |
| 5310 | 21741 | 14 |
| 2950 | 12597 | 8 |
| 620 | 2892 | 1 |
| 11370 | 48732 | 32 |
| 2790 | 11731 | 7 |
| 2400 | 9733 | 6 |
| 2110 | 8268 | 5 |
| 11010 | 47398 | 31 |
| 1560 | 6140 | 4 |
| 3270 | 13937 | 9 |
| 640 | 2355 | 1 |
| 990 | 3698 | 2 |
| 480 | 1768 | 1 |
| 3120 | 12896 | 8 |
| 2600 | 11322 | 7 |
| 4,923 | 20,504 | 13 |

| time | iterations | restarts |
|--------------|---------------|-----------|
| 5360 | 21072 | 14 |
| 1700 | 7295 | 4 |
| 6590 | 27135 | 18 |
| 900 | 3466 | 2 |
| 5710 | 24439 | 16 |
| 4000 | 16161 | 10 |
| 4760 | 21600 | 14 |
| 1480 | 5834 | 3 |
| 15100 | 63697 | 42 |
| 12840 | 54234 | 36 |
| 4270 | 19252 | 12 |
| 7360 | 32230 | 21 |
| 7330 | 32695 | 21 |
| 2370 | 10163 | 6 |
| 6890 | 29354 | 19 |
| 1080 | 4570 | 3 |
| 10340 | 44978 | 29 |
| 13190 | 56969 | 37 |
| 8370 | 36197 | 24 |
| 3260 | 14755 | 9 |
| 970 | 4450 | 2 |
| 920 | 4247 | 2 |
| 4250 | 17070 | 11 |
| 3630 | 15300 | 10 |
| 8690 | 36498 | 24 |
| 2000 | 7965 | 5 |
| 3760 | 15501 | 10 |
| 7390 | 29296 | 19 |
| 3370 | 14731 | 9 |
| 1430 | 6169 | 4 |
| 5,310 | 22,577 | 15 |

4,687 19,743 13

3,863 16,488 11

Golomb Ruler

Golmb Ruler 11-72

Using Tabu List (no communication)

Without Tabu List (no communication)

Eps = 4

Norm = 8

tabu size = 15

| time | iterations | restarts |
|---------------|----------------|-----------|
| 32170 | 58451 | 19 |
| 86650 | 156935 | 52 |
| 161460 | 293271 | 97 |
| 220280 | 398176 | 132 |
| 74050 | 136241 | 45 |
| 66420 | 119174 | 39 |
| 179500 | 327108 | 109 |
| 117350 | 212795 | 70 |
| 103960 | 192214 | 64 |
| 9800 | 17999 | 5 |
| 25290 | 45418 | 15 |
| 108060 | 201626 | 67 |
| 119020 | 219628 | 73 |
| 18550 | 34456 | 11 |
| 210190 | 384418 | 128 |
| 53520 | 100043 | 33 |
| 127630 | 230691 | 76 |
| 52620 | 96214 | 32 |
| 214640 | 383587 | 127 |
| 28080 | 50999 | 16 |
| 79130 | 146484 | 48 |
| 55850 | 103242 | 34 |
| 91340 | 167080 | 55 |
| 7270 | 12421 | 4 |
| 184280 | 338482 | 112 |
| 1620 | 2999 | 0 |
| 12520 | 22971 | 7 |
| 3640 | 6928 | 2 |
| 34220 | 64652 | 21 |
| 71590 | 132829 | 44 |
| 85,023 | 155,251 | 51 |
| 67,223 | 121,929 | 41 |

| time | iterations | restarts |
|---------------|----------------|-----------|
| 273700 | 508450 | 169 |
| 30790 | 56778 | 18 |
| 103280 | 192006 | 64 |
| 53230 | 95905 | 31 |
| 41540 | 78212 | 26 |
| 58890 | 104483 | 34 |
| 90190 | 167372 | 55 |
| 133910 | 248677 | 82 |
| 82350 | 152068 | 50 |
| 150320 | 273317 | 91 |
| 1430 | 2785 | 0 |
| 95300 | 173065 | 57 |
| 173490 | 311376 | 103 |
| 51820 | 95176 | 31 |
| 21590 | 40349 | 13 |
| 40000 | 73144 | 24 |
| 123830 | 232758 | 77 |
| 82010 | 149688 | 49 |
| 60880 | 113789 | 37 |
| 98000 | 181972 | 60 |
| 56980 | 104485 | 34 |
| 129980 | 236088 | 78 |
| 98100 | 180725 | 60 |
| 78750 | 146276 | 48 |
| 166690 | 302689 | 100 |
| 82660 | 151445 | 50 |
| 92160 | 164589 | 54 |
| 142440 | 263995 | 87 |
| 54130 | 98081 | 32 |
| 24350 | 43139 | 14 |
| 89,760 | 164,763 | 54 |
| 55,859 | 102,931 | 34 |

Golomb Ruler

Golomb Ruler 8-34

Using Tabu List (communication 1-1)

Using Tabu List (communication 1-n)

Eps = 4

Norm = 8

tabu size = 40

| time | iterations | restarts |
|-----------|------------|----------|
| 40 | 431 | 2 |
| 30 | 199 | 0 |
| 30 | 140 | 0 |
| 30 | 316 | 1 |
| 80 | 569 | 2 |
| 60 | 340 | 1 |
| 40 | 202 | 1 |
| 30 | 140 | 0 |
| 30 | 113 | 0 |
| 160 | 1202 | 6 |
| 90 | 570 | 2 |
| 60 | 430 | 2 |
| 30 | 262 | 1 |
| 50 | 395 | 1 |
| 30 | 143 | 0 |
| 40 | 337 | 1 |
| 30 | 263 | 1 |
| 40 | 312 | 1 |
| 20 | 193 | 0 |
| 20 | 120 | 0 |
| 30 | 286 | 1 |
| 30 | 112 | 0 |
| 20 | 174 | 0 |
| 10 | 89 | 0 |
| 80 | 573 | 2 |
| 20 | 60 | 0 |
| 30 | 289 | 1 |
| 70 | 460 | 2 |
| 10 | 4 | 0 |
| 90 | 543 | 2 |
| 44 | 309 | 1 |
| 31 | 233 | 1 |

| time | iterations | restarts |
|-----------|------------|----------|
| 20 | 87 | 0 |
| 10 | 30 | 0 |
| 20 | 113 | 0 |
| 80 | 543 | 2 |
| 70 | 403 | 2 |
| 10 | 57 | 0 |
| 70 | 460 | 2 |
| 40 | 203 | 1 |
| 10 | 121 | 0 |
| 10 | 62 | 0 |
| 80 | 594 | 2 |
| 40 | 203 | 1 |
| 30 | 203 | 1 |
| 10 | 87 | 0 |
| 70 | 342 | 1 |
| 90 | 630 | 3 |
| 40 | 368 | 1 |
| 10 | 3 | 0 |
| 80 | 632 | 3 |
| 60 | 488 | 2 |
| 20 | 203 | 1 |
| 10 | 30 | 0 |
| 70 | 492 | 2 |
| 40 | 170 | 0 |
| 80 | 570 | 2 |
| 40 | 261 | 1 |
| 100 | 768 | 3 |
| 10 | 60 | 0 |
| 50 | 289 | 1 |
| 10 | 3 | 0 |
| 43 | 283 | 1 |
| 30 | 225 | 1 |

Golomb Ruler

Golmb Ruler 10-55

Using Tabu List (communication 1-1)

Using Tabu List (communication 1-n)

Eps = 4

Norm = 8

tabu size = 40

| time | iterations | restarts |
|--------------|---------------|-----------|
| 1370 | 5957 | 3 |
| 440 | 1613 | 1 |
| 6440 | 26337 | 17 |
| 590 | 2402 | 1 |
| 310 | 1258 | 0 |
| 1790 | 7891 | 5 |
| 2880 | 11075 | 7 |
| 1700 | 6537 | 4 |
| 260 | 797 | 0 |
| 550 | 2409 | 1 |
| 5750 | 21993 | 14 |
| 6800 | 26270 | 17 |
| 9100 | 35963 | 23 |
| 1070 | 4018 | 2 |
| 3010 | 11320 | 7 |
| 4590 | 17455 | 11 |
| 10120 | 40753 | 27 |
| 3620 | 14283 | 9 |
| 3080 | 12199 | 8 |
| 430 | 1674 | 1 |
| 9580 | 39655 | 26 |
| 3060 | 11673 | 7 |
| 7210 | 28998 | 19 |
| 1310 | 5008 | 3 |
| 6620 | 27298 | 18 |
| 8850 | 35597 | 23 |
| 2480 | 10118 | 6 |
| 9170 | 32662 | 21 |
| 1460 | 5952 | 3 |
| 3460 | 13935 | 9 |
| 3,903 | 15,437 | 10 |
| 3,225 | 12,789 | 9 |

| time | iterations | restarts |
|--------------|---------------|----------|
| 8180 | 35159 | 23 |
| 7920 | 33205 | 22 |
| 1350 | 5190 | 3 |
| 3030 | 11119 | 7 |
| 3460 | 15232 | 10 |
| 630 | 2326 | 1 |
| 9300 | 36107 | 24 |
| 1680 | 6760 | 4 |
| 170 | 757 | 0 |
| 5520 | 21400 | 14 |
| 210 | 758 | 0 |
| 1100 | 4314 | 2 |
| 8150 | 32458 | 21 |
| 1510 | 5813 | 3 |
| 460 | 1897 | 1 |
| 2230 | 8359 | 5 |
| 3650 | 14376 | 9 |
| 1240 | 4771 | 3 |
| 580 | 2432 | 1 |
| 460 | 1743 | 1 |
| 5560 | 22256 | 14 |
| 1470 | 5451 | 3 |
| 960 | 3858 | 2 |
| 1280 | 5100 | 3 |
| 4800 | 20616 | 13 |
| 3760 | 14826 | 9 |
| 1620 | 6434 | 4 |
| 1370 | 5199 | 3 |
| 7910 | 29852 | 19 |
| 5290 | 20388 | 13 |
| 3,162 | 12,605 | 8 |
| 2,824 | 11,405 | 8 |

Golomb Ruler

Golmb Ruler 11-72

Using Tabu List (communication 1-1)

Using Tabu List (communication 1-n)

Eps = 4

Norm = 8

tabu size = 40

| time | iterations | restarts |
|---------------|----------------|-----------|
| 58150 | 104687 | 34 |
| 211410 | 387838 | 129 |
| 5580 | 10135 | 3 |
| 81170 | 151964 | 50 |
| 44770 | 80806 | 26 |
| 92430 | 163137 | 54 |
| 62460 | 111108 | 37 |
| 48680 | 87420 | 29 |
| 50410 | 89278 | 29 |
| 192780 | 356580 | 118 |
| 84510 | 158490 | 52 |
| 174050 | 321314 | 107 |
| 62130 | 110587 | 36 |
| 116400 | 209895 | 69 |
| 69700 | 127352 | 42 |
| 78790 | 143793 | 47 |
| 53510 | 100957 | 33 |
| 42740 | 76143 | 25 |
| 73150 | 131271 | 43 |
| 38160 | 72321 | 24 |
| 12310 | 22243 | 7 |
| 96690 | 179268 | 59 |
| 190280 | 350380 | 116 |
| 78940 | 143379 | 47 |
| 98090 | 180525 | 60 |
| 159820 | 295856 | 98 |
| 96030 | 175445 | 58 |
| 78610 | 141931 | 47 |
| 24700 | 44064 | 14 |
| 86470 | 158172 | 52 |
| 85,431 | 156,211 | 52 |
| 52,610 | 97,330 | 32 |

| time | iterations | restarts |
|---------------|----------------|-----------|
| 170270 | 312109 | 104 |
| 62810 | 111833 | 37 |
| 14140 | 26681 | 8 |
| 53730 | 97756 | 32 |
| 16230 | 28758 | 9 |
| 24030 | 42519 | 14 |
| 39870 | 74069 | 24 |
| 59800 | 107992 | 35 |
| 16660 | 30007 | 10 |
| 79380 | 146171 | 48 |
| 95520 | 175044 | 58 |
| 118760 | 217352 | 72 |
| 21140 | 37044 | 12 |
| 19580 | 34345 | 11 |
| 124340 | 224683 | 74 |
| 85260 | 152680 | 50 |
| 10690 | 19041 | 6 |
| 75000 | 136039 | 45 |
| 26580 | 46451 | 15 |
| 154340 | 287165 | 95 |
| 7170 | 12523 | 4 |
| 44110 | 81521 | 27 |
| 90380 | 168320 | 56 |
| 32580 | 59889 | 19 |
| 47430 | 83487 | 27 |
| 114890 | 215689 | 71 |
| 47620 | 85957 | 28 |
| 13730 | 24413 | 8 |
| 77170 | 144113 | 48 |
| 67510 | 125686 | 41 |
| 60,357 | 110,311 | 36 |
| 43,951 | 81,296 | 27 |

Golomb Ruler

Golmb Ruler 8-34

Sequential (without tabu list)

| time | iterations | restarts |
|------------|---------------|-----------|
| 80 | 1232 | 6 |
| 950 | 15915 | 79 |
| 400 | 6803 | 34 |
| 600 | 10316 | 51 |
| 880 | 14802 | 74 |
| 2050 | 33658 | 168 |
| 2580 | 43742 | 218 |
| 200 | 3313 | 16 |
| 690 | 10887 | 54 |
| 1640 | 26832 | 134 |
| 1040 | 17171 | 85 |
| 210 | 3486 | 17 |
| 240 | 4082 | 20 |
| 100 | 1717 | 8 |
| 130 | 2483 | 12 |
| 1040 | 18059 | 90 |
| 1720 | 28799 | 143 |
| 1070 | 18138 | 90 |
| 1290 | 21230 | 106 |
| 40 | 740 | 3 |
| 460 | 7604 | 38 |
| 100 | 1741 | 8 |
| 940 | 15030 | 75 |
| 110 | 1887 | 9 |
| 1760 | 28857 | 144 |
| 420 | 7172 | 35 |
| 1440 | 25339 | 126 |
| 780 | 13258 | 66 |
| 220 | 3857 | 19 |
| 670 | 11030 | 55 |
| 795 | 13,306 | 66 |
| 668 | 11,154 | 56 |

Sequential (with tabu list)

Eps = 4

Norm = 8

tabu size = 15

| time | iterations | restarts |
|------------|---------------|-----------|
| 1090 | 17140 | 85 |
| 10 | 233 | 1 |
| 240 | 3860 | 19 |
| 2190 | 36030 | 180 |
| 2350 | 37203 | 186 |
| 700 | 11366 | 56 |
| 150 | 2634 | 13 |
| 740 | 11461 | 57 |
| 870 | 13795 | 68 |
| 80 | 1260 | 6 |
| 50 | 994 | 4 |
| 450 | 7202 | 36 |
| 970 | 15796 | 78 |
| 510 | 8142 | 40 |
| 100 | 1547 | 7 |
| 1230 | 20487 | 102 |
| 500 | 8287 | 41 |
| 560 | 9311 | 46 |
| 860 | 14089 | 70 |
| 70 | 1345 | 6 |
| 510 | 8343 | 41 |
| 450 | 7342 | 36 |
| 80 | 1401 | 7 |
| 260 | 4340 | 21 |
| 1960 | 31257 | 156 |
| 260 | 4086 | 20 |
| 1340 | 21514 | 107 |
| 250 | 3942 | 19 |
| 30 | 546 | 2 |
| 1070 | 17399 | 86 |
| 664 | 10,745 | 53 |
| 639 | 10,260 | 51 |

Golomb Ruler

Golomb Ruler 10-55

Sequential (without tabu list)Sequential (with tabu list)

Eps = 4

Norm = 8

tabu size = 15

| time | iterations | restarts |
|---------------|----------------|------------|
| 11540 | 85707 | 57 |
| 106120 | 759399 | 506 |
| 58220 | 411362 | 274 |
| 49070 | 342733 | 228 |
| 20200 | 146027 | 97 |
| 47620 | 327598 | 218 |
| 55600 | 372135 | 248 |
| 90620 | 610539 | 407 |
| 7650 | 52896 | 35 |
| 145150 | 966493 | 644 |
| 33210 | 224551 | 149 |
| 96990 | 662726 | 441 |
| 47300 | 318721 | 212 |
| 15960 | 108936 | 72 |
| 18560 | 130505 | 87 |
| 7480 | 50949 | 33 |
| 68200 | 471494 | 314 |
| 92600 | 620422 | 413 |
| 22950 | 156637 | 104 |
| 45450 | 306110 | 204 |
| 34570 | 188025 | 125 |
| 112110 | 768339 | 512 |
| 142360 | 965061 | 643 |
| 142300 | 960895 | 640 |
| 78720 | 528396 | 352 |
| 56810 | 389701 | 259 |
| 12120 | 82335 | 54 |
| 58860 | 387600 | 258 |
| 208790 | 1417178 | 944 |
| 106150 | 729103 | 486 |
| 66,443 | 451,419 | 301 |
| 49,569 | 336,859 | 225 |

| time | iterations | restarts |
|---------------|----------------|------------|
| 17720 | 117993 | 78 |
| 146880 | 993766 | 662 |
| 63660 | 428626 | 285 |
| 10090 | 67926 | 45 |
| 75560 | 514704 | 343 |
| 53700 | 372893 | 248 |
| 147140 | 1011234 | 674 |
| 57570 | 400503 | 267 |
| 44530 | 295743 | 197 |
| 40970 | 277320 | 184 |
| 410 | 2791 | 1 |
| 40840 | 271494 | 180 |
| 57140 | 382793 | 255 |
| 38570 | 256086 | 170 |
| 134890 | 894727 | 596 |
| 91410 | 608716 | 405 |
| 57340 | 389626 | 259 |
| 105230 | 728128 | 485 |
| 114190 | 790798 | 527 |
| 110290 | 758168 | 505 |
| 23310 | 157930 | 105 |
| 14320 | 88766 | 59 |
| 151240 | 1007429 | 671 |
| 88750 | 600499 | 400 |
| 39030 | 257327 | 171 |
| 51060 | 221101 | 147 |
| 37810 | 198660 | 132 |
| 24270 | 156268 | 104 |
| 5610 | 32591 | 21 |
| 193370 | 1122786 | 748 |
| 67,897 | 446,913 | 297 |
| 50,024 | 328,912 | 219 |

Golomb Ruler

Golmb Ruler 11-72

Sequential (without tabu list)

| time | iterations | restarts |
|--------|------------|----------|
| 279920 | 536214 | 178 |
| 123870 | 246321 | 82 |
| 158860 | 486633 | 162 |
| 59290 | 187837 | 62 |
| 298830 | 914400 | 304 |
| 216040 | 673087 | 224 |
| 98300 | 301330 | 100 |
| 47670 | 107164 | 35 |

Sequential (with tabu list)

Eps = 4

Norm = 8

tabu size = 15

| time | iterations | restarts |
|--------|------------|----------|
| 26420 | 80481 | 26 |
| 126880 | 414007 | 138 |
| 140600 | 462828 | 154 |
| 68180 | 214270 | 71 |
| 272440 | 859895 | 286 |
| 10300 | 34398 | 11 |
| 124410 | 417131 | 139 |
| 72180 | 243698 | 81 |
| 216000 | 716845 | 238 |

| | | |
|----------------|----------------|------------|
| 160,348 | 431,623 | 143 |
| 96,116 | 272,911 | 91 |

| | | |
|----------------|----------------|------------|
| 117,490 | 382,617 | 127 |
| 85,624 | 275,748 | 92 |