

Lab 10

Function	Big O
<pre>void swap(int* a, int i, int j) { c++; int t = a[i]; a[i] = a[j]; a[j] = t; }</pre>	O(1)
<pre>void min_heapify(int* a,int n,int i) { int s=i; int l = 2*i+1; int r = 2*i+2; if(l<n && a[l]<a[s]) { s = l; } if((r)<n && a[r]<a[s]) s = r; if(s!=i) { swap(a,i,s); min_heapify(a,n,s); } }</pre>	O(logn)
<pre>void build_heap(int* a,int n) { for(int i=n/2-1;i>=0;i--) { min_heapify(a,n,i); } }</pre>	O(n*logn)
<pre>void sort(int* a,int n) { for(int i=1;i<n;i++) { swap(a,0,n-i); min_heapify(a,n-i,0); } }</pre>	O(n*logn)
<pre>void printFirst(int* a,int n,int k) { for(int i=1;i<=k;i++) { printf("%d ",a[0]); swap(a,0,n-i); min_heapify(a,n-i,0); } }</pre>	<p>$k = n\%100+r$</p> <p>O(k)</p> <p>O(k*logn)</p> <p>O(k*logn)</p>

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[2019A7P50020U@linuxbpcdc1 Week_10]$ cc lab_10.c
[2019A7P50020U@linuxbpcdc1 Week_10]$ a.out
Total number of swaps: 20
Total number of swaps: 45
Total number of swaps: 89
Total number of swaps: 169
Total number of swaps: 319
Total number of swaps: 693
Total number of swaps: 1437
Total number of swaps: 2869
Total number of swaps: 5742
Total number of swaps: 11442
Total number of swaps: 22842
Total number of swaps: 45611
Total number of swaps: 91410
Total number of swaps: 182897
Total number of swaps: 365897
Total number of swaps: 731036
Total number of swaps: 1463385
Total number of swaps: 2925304

Size 30 printing first 30 elements:
2362 2567 3135 5211 13926 16649 20059 21530 22862 30886 36915 38335 41421 47793 55736 56429 60492 65123 65782 68690 74067 80540 83426 85386 89172 89383 90027 92777 95368 97
763

Size 60 printing first 60 elements:
545 2305 2651 3526 5403 6862 6996 12399 13750 13784 13929 15434 16124 17276 18456 19582 20925 21729 23058 25857 26505 26808 33069 33367 34022 36327 41873 44043 44919 47178
50846 53895 59956 60336 61313 61393 64370 66413 68980 71087 75011 75198 76091 76229 77084 77373 78042 79802 84421 90364 92754 93584 94324 95788 9781 98167 98315 98537 9881
4 99170

Size 120 printing first 40 elements:
723 1474 2245 2904 4567 5732 5771 6219 8117 8235 9441 9503 9859 10012 10097 12902 14613 16437 18149 18606 18776 20709 22227 22404 22846 24286 24914 26340 26652 28444 28624
29689 30019 31011 32871 34481 35928 36029 36226 36840

Size 240 printing first 60 elements:
973 1255 1961 2021 2336 2422 2954 3033 3348 3465 3729 3881 5363 5385 5624 6042 6640 6725 6887 7669 7672 8282 8542 8581 8872 8933 9188 10197 10253 10498 11127 11385 11340 11
705 11899 11972 12183 12497 12924 13282 13258 13773 13810 13996 14500 14769 15667 16466 17445 17505 17567 17721 18004 18418 18808 18944 19125 19301 19379 19529

Size 480 printing first 100 elements:
81 237 346 569 606 681 925 1039 1052 1063 1360 1839 1947 1962 2215 2254 2647 2726 2747 2829 2900 3074 3177 3190 3493 3682 4234 4289 4292 4339 4346 4789 4794 4916 5057 5153
5236 5989 6355 6367 6403 6710 6732 7205 7398 7556 7971 8324 8538 8860 8902 9016 9117 9211 9365 9485 9610 9933 10294 10537 10563 10699 10873 10991 11017 11131 11388 11574 11
19080 19128 19805

Size 960 printing first 80 elements:
10 30 335 657 669 699 760 801 821 938 960 1171 1173 1183 1281 1354 1485 1535 1745 1832 1877 1937 1996 2255 2293 2408 2443 2450 2533 2557 2606 2671 2906 3050 3124 3134 3566
3605 3662 3708 3759 3786 3807 4213 4310 4313 4465 4486 4667 4697 4899 4919 4978 5000 5216 5340 5360 5400 5404 5661 5735 5981 5994 6141 6202 6312 6368 6424 6445 6506 6518 65
27 6582 6616 6629 6649 6773 6797 6898 6952

Size 1920 printing first 40 elements:
34 96 113 117 131 313 361 573 658 707 754 835 838 848 867 870 930 987 1004 1101 1114 1211 1270 1379 1392 1425 1433 1455 1493 1520 1533 1554 1568 1642 1653 1655 1662 16
82 1842

Size 3840 printing first 60 elements:
44 77 93 178 202 213 224 253 255 257 260 272 279 305 321 323 345 352 406 469 474 486 487 549 553 599 681 691 702 721 731 734 745 760 760 805 816 820 843 857 885 941 975 980
994 1002 1028 1051 1055 1064 1068 1070 1082 1088 1091 1092 1094 1110 1111 1132

Size 7680 printing first 100 elements:
4 13 14 29 64 154 158 161 179 216 227 250 272 301 308 334 344 374 396 422 443 461 479 494 494 514 536 543 543 550 574 576 579 594 597 644 668 688 701 712 713 735 736 742 75
3 775 792 810 826 832 867 875 890 918 926 935 940 947 950 961 971 984 985 989 996 997 998 1014 1056 1064 1069 1070 1079 1079 1101 1105 1113 1117 1130 1157 1163 1167 1176 11
81 1192 1200 1203 1206 1212 1218 1241 1244 1246 1251 1255 1259 1282 1282 1286 1298

Size 15360 printing first 80 elements:
0 8 13 13 20 33 34 44 48 51 52 56 60 62 81 85 106 108 114 115 132 138 153 156 160 166 168 169 174 176 176 177 185 193 196 198 206 208 210 211 220 229 234 256 266 271 275 28
1 286 299 307 311 317 321 329 343 348 356 359 361 373 380 386 391 403 405 411 411 414 418 422 424 430 434 436 440 446 449 467 472

Size 30720 printing first 40 elements:
1 2 2 3 4 9 11 12 14 20 23 25 25 36 35 36 50 62 63 66 68 70 71 75 78 83 84 86 86 88 90 91 95 96 115 118 120 123 129

Size 61440 printing first 60 elements:
0 3 3 3 3 4 13 14 17 17 19 20 20 22 24 26 27 29 31 31 33 36 36 36 37 39 40 41 42 42 43 43 48 49 50 51 52 55 56 58 62 63 64 65 68 68 69 69 73 74 75 76 77 79 81 81 81 83 8
3

Size 122880 printing first 100 elements:
0 0 1 2 2 2 3 6 8 10 12 14 15 15 15 17 17 21 25 25 26 28 28 29 29 32 32 34 34 34 36 39 39 40 40 40 42 43 44 45 47 49 50 52 52 53 53 55 56 56 56 58 58 59 59 60 61 6
1 61 61 62 62 62 63 64 65 66 70 70 70 72 73 75 76 76 76 78 79 81 81 84 84 86 87 88 89 90 90 91 91 94 95 95 98 99 101

Size 245760 printing first 80 elements:
0 0 0 1 2 2 2 3 3 4 5 5 5 6 6 6 6 7 8 8 9 9 10 
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