Rezultate sortări

Algoritmi testaţi: MergeSort, QuickSort cu mediana din 3, QuickSort pivot random, ShellSort, HeapSort (max heap), RadixSort baza 10, RadixSort baza 2^10, RadixSort baza 2^16, C++ sort.

Ordinea algoritmilor este în general RadixSort, C++ sort/ QuickSort, MergeSort, ShellSort şi HeapSort (C++ variază între QuickSort şi MergeSort), de la cel mai rapid la cel mai încet.

Teste

Testul 1, n = 10^3, max = 10^3

Testul 2, n = 10^3, max = 10^7

Testul 3, n = 10^5, max = 10^3

Testul 4, n = 10^5, max = 10^5

Testul 5, n = 10^6, max = 10^3

Testul 6, n = 10^6, max = 10^7

Testul 7, n = 10^7, max = 10^3

Testul 8, n = 10^7, max = 10^5

Testul 9, n = 10^7, max = 10^8

Testul 10, n = 10^8, max = 10^3

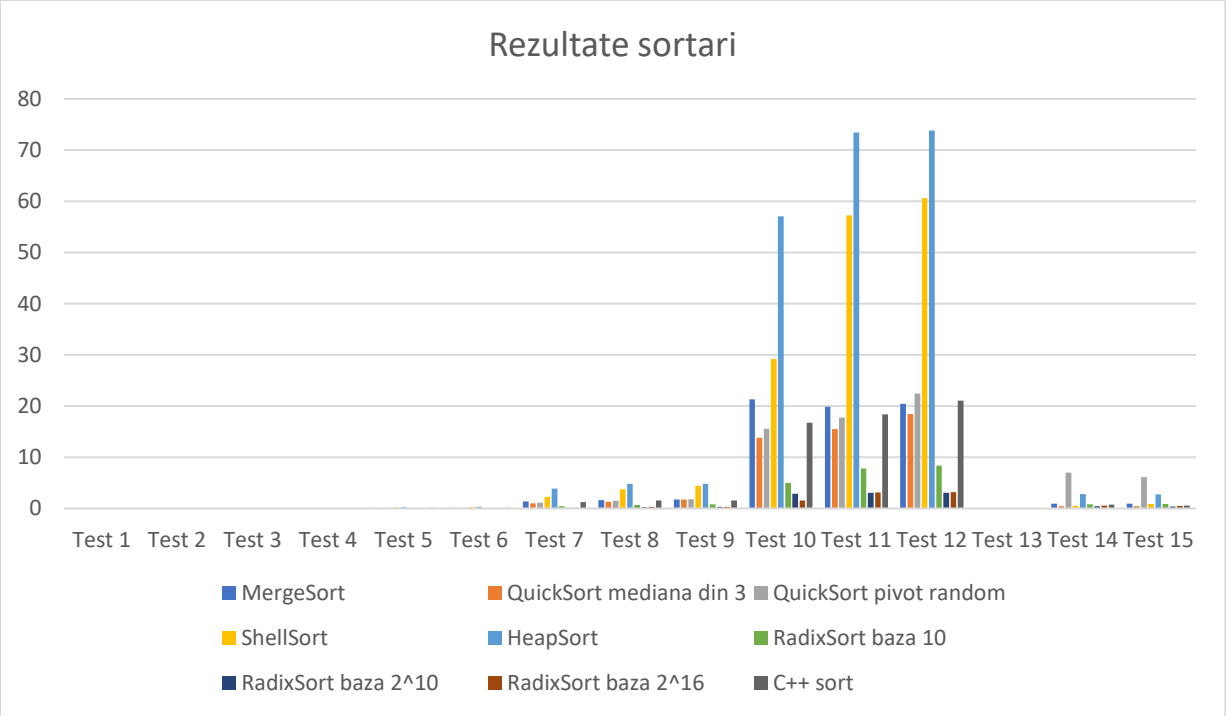
Testul 11, n = 10^8, max = 10^7

Testul 12, n = 10^8, max = 10^8

Testul 13, n = 10^6, max = 1 (doar 1)

Testul 14, n = 10^7, max = 10^7 strict crescător

Testul 15, n = 10^7, max = 10^7 strict descrescător



Observaţii:

-până la Testul 5 nu se observă mari diferențe între cele 2 variante de QuickSort, însă începând cu Testul 6 QuickSort cu mediana din 3 este mai rapid

-HeapSort este cel mai încet pe majoritatea testelor, însă cel mai rapid pe Testul 13 (doar valori de 1)

-cele 3 variante de RadixSort sunt cele mai rapide pe majoritatea testelor, fiind diferențe mari între ele și ceilalalți algoritmi; ordinea lor este în medie baza 2^10, baza 2^16, baza 10 de la cel mai rapid la cel mai încet

-până la 10^7 numere aleatorii nu sunt diferențe atât de mari între algoritmi (cu excepția HeapSort și ShellSort), dar între 10^7 și 10^8 numere apar diferențe foarte mari, mai ales între cel mai rapid și cel mai încet algoritm

Toate rezultatele

Testele au fost generate cu librăria random din Python

Testul 1, n = 10^3, max = 10^3

MergeSort test 1: 0 ns

MergeSort test 2: 219000 ns

MergeSort test 3: 0 ns

QuickSort mediana 3 test 1: 0 ns

QuickSort mediana 3 test 2: 0 ns

QuickSort mediana 3 test 3: 0 ns

QuickSort pivot random test 1: 0 ns

QuickSort pivot random test 2: 0 ns

QuickSort pivot random test 3: 501000 ns

ShellSort test 1: 0 ns

ShellSort test 2: 0 ns

ShellSort test 3: 0 ns

HeapSort test 1: 0 ns

HeapSort test 2: 0 ns

HeapSort test 3: 125000 ns

RadixSort baza 10 test 1: 0 ns

RadixSort baza 10 test 2: 640000 ns

RadixSort baza 10 test 3: 0 ns

RadixSort baza 2^10 test 1: 0 ns

RadixSort baza 2^10 test 2: 0 ns

RadixSort baza 2^10 test 3: 0 ns

RadixSort baza 2^16 test 1: 0 ns

RadixSort baza 2^16 test 2: 614000 ns

RadixSort baza 2^16 test 3: 0 ns

C++ sort test 1: 0 ns

C++ sort test 2: 0 ns

C++ sort test 3: 0 ns

Testul 2, n = 10^3, max = 10^7

MergeSort test 1: 0 ns

MergeSort test 2: 0 ns

MergeSort test 3: 0 ns

QuickSort mediana 3 test 1: 0 ns

QuickSort mediana 3 test 2: 0 ns

QuickSort mediana 3 test 3: 0 ns

QuickSort pivot random test 1: 0 ns

QuickSort pivot random test 2: 0 ns

QuickSort pivot random test 3: 0 ns

ShellSort test 1: 0 ns

ShellSort test 2: 0 ns

ShellSort test 3: 1042000 ns

HeapSort test 1: 0 ns

HeapSort test 2: 0 ns

HeapSort test 3: 0 ns

RadixSort baza 10 test 1: 0 ns

RadixSort baza 10 test 2: 640000 ns

RadixSort baza 10 test 3: 0 ns

RadixSort baza 2^10 test 1: 0 ns

RadixSort baza 2^10 test 2: 0 ns

RadixSort baza 2^10 test 3: 0 ns

RadixSort baza 2^16 test 1: 0 ns

RadixSort baza 2^16 test 2: 0 ns

RadixSort baza 2^16 test 3: 0 ns

C++ sort test 1: 0 ns

C++ sort test 2: 0 ns

C++ sort test 3: 0 ns

Testul 3, n = 10^5, max = 10^3

MergeSort test 1: 10993000 ns

MergeSort test 2: 10961000 ns

MergeSort test 3: 0 ns

MergeSort test 4: 15838000 ns

MergeSort test 5: 8465000 ns

QuickSort mediana 3 test 1: 7999000 ns

QuickSort mediana 3 test 2: 8004000 ns

QuickSort mediana 3 test 3: 8612000 ns

QuickSort mediana 3 test 4: 19665000 ns

QuickSort mediana 3 test 5: 0 ns

QuickSort pivot random test 1: 10489000 ns

QuickSort pivot random test 2: 10992000 ns

QuickSort pivot random test 3: 0 ns

QuickSort pivot random test 4: 0 ns

QuickSort pivot random test 5: 8998000 ns

ShellSort test 1: 20441000 ns

ShellSort test 2: 16042000 ns

ShellSort test 3: 17710000 ns

ShellSort test 4: 15999000 ns

ShellSort test 5: 16994000 ns

HeapSort test 1: 20760000 ns

HeapSort test 2: 15625000 ns

HeapSort test 3: 20007000 ns

HeapSort test 4: 21037000 ns

HeapSort test 5: 15624000 ns

RadixSort baza 10 test 1: 3871000 ns

RadixSort baza 10 test 2: 4004000 ns

RadixSort baza 10 test 3: 4001000 ns

RadixSort baza 10 test 4: 0 ns

RadixSort baza 10 test 5: 3004000 ns

RadixSort baza 2^10 test 1: 0 ns

RadixSort baza 2^10 test 2: 993000 ns

RadixSort baza 2^10 test 3: 1001000 ns

RadixSort baza 2^10 test 4: 985000 ns

RadixSort baza 2^10 test 5: 0 ns

RadixSort baza 2^16 test 1: 0 ns

RadixSort baza 2^16 test 2: 2498000 ns

RadixSort baza 2^16 test 3: 2002000 ns

RadixSort baza 2^16 test 4: 2078000 ns

RadixSort baza 2^16 test 5: 0 ns

C++ sort test 1: 9091000 ns

C++ sort test 2: 15674000 ns

C++ sort test 3: 9009000 ns

C++ sort test 4: 9995000 ns

C++ sort test 5: 9017000 ns

Testul 4, n = 10^5, max = 10^5

MergeSort test 1: 23039000 ns

MergeSort test 2: 12809000 ns

MergeSort test 3: 12895000 ns

MergeSort test 4: 12002000 ns

MergeSort test 5: 12284000 ns

QuickSort mediana 3 test 1: 9994000 ns

QuickSort mediana 3 test 2: 13247000 ns

QuickSort mediana 3 test 3: 0 ns

QuickSort mediana 3 test 4: 18283000 ns

QuickSort mediana 3 test 5: 15626000 ns

QuickSort pivot random test 1: 17378000 ns

QuickSort pivot random test 2: 4673000 ns

QuickSort pivot random test 3: 0 ns

QuickSort pivot random test 4: 7325000 ns

QuickSort pivot random test 5: 0 ns

ShellSort test 1: 5141000 ns

ShellSort test 2: 17903000 ns

ShellSort test 3: 17992000 ns

ShellSort test 4: 16023000 ns

ShellSort test 5: 18005000 ns

HeapSort test 1: 15723000 ns

HeapSort test 2: 31238000 ns

HeapSort test 3: 15632000 ns

HeapSort test 4: 22178000 ns

HeapSort test 5: 31214000 ns

RadixSort baza 10 test 1: 5984000 ns

RadixSort baza 10 test 2: 0 ns

RadixSort baza 10 test 3: 7996000 ns

RadixSort baza 10 test 4: 0 ns

RadixSort baza 10 test 5: 5957000 ns

RadixSort baza 2^10 test 1: 1917000 ns

RadixSort baza 2^10 test 2: 1994000 ns

RadixSort baza 2^10 test 3: 0 ns

RadixSort baza 2^10 test 4: 0 ns

RadixSort baza 2^10 test 5: 0 ns

RadixSort baza 2^16 test 1: 0 ns

RadixSort baza 2^16 test 2: 0 ns

RadixSort baza 2^16 test 3: 0 ns

RadixSort baza 2^16 test 4: 1995000 ns

RadixSort baza 2^16 test 5: 0 ns

C++ sort test 1: 11006000 ns

C++ sort test 2: 10890000 ns

C++ sort test 3: 12003000 ns

C++ sort test 4: 11082000 ns

C++ sort test 5: 11000000 ns

Testul 5, n = 10^6, max = 10^3

MergeSort test 1: 131265000 ns 131265 ms 0 s

MergeSort test 2: 136490000 ns 136490 ms 0 s

MergeSort test 3: 149994000 ns 149994 ms 0 s

QuickSort mediana 3 test 1: 92871000 ns 92871 ms 0 s

QuickSort mediana 3 test 2: 85282000 ns 85282 ms 0 s

QuickSort mediana 3 test 3: 91223000 ns 91223 ms 0 s

QuickSort pivot random test 1: 105740000 ns 105740 ms 0 s

QuickSort pivot random test 2: 140879000 ns 140879 ms 0 s

QuickSort pivot random test 3: 90396000 ns 90396 ms 0 s

ShellSort test 1: 195563000 ns 195563 ms 0 s

ShellSort test 2: 212929000 ns 212929 ms 0 s

ShellSort test 3: 188583000 ns 188583 ms 0 s

HeapSort test 1: 282394000 ns 282394 ms 0 s

HeapSort test 2: 265670000 ns 265670 ms 0 s

HeapSort test 3: 263197000 ns 263197 ms 0 s

RadixSort baza 10 test 1: 40956000 ns 40956 ms 0 s

RadixSort baza 10 test 2: 50186000 ns 50186 ms 0 s

RadixSort baza 10 test 3: 50748000 ns 50748 ms 0 s

RadixSort baza 2^10 test 1: 11006000 ns 11006 ms 0 s

RadixSort baza 2^10 test 2: 11999000 ns 11999 ms 0 s

RadixSort baza 2^10 test 3: 13012000 ns 13012 ms 0 s

RadixSort baza 2^16 test 1: 11991000 ns 11991 ms 0 s

RadixSort baza 2^16 test 2: 12001000 ns 12001 ms 0 s

RadixSort baza 2^16 test 3: 13998000 ns 13998 ms 0 s

C++ sort test 1: 105085000 ns 105085 ms 0 s

C++ sort test 2: 106002000 ns 106002 ms 0 s

C++ sort test 3: 104314000 ns 104314 ms 0 s

Testul 6, n = 10^6, max = 10^7

MergeSort test 1: 129991000 ns 129991 ms 0 s

MergeSort test 2: 153826000 ns 153826 ms 0 s

MergeSort test 3: 148911000 ns 148911 ms 0 s

QuickSort mediana 3 test 1: 127213000 ns 127213 ms 0 s

QuickSort mediana 3 test 2: 118445000 ns 118445 ms 0 s

QuickSort mediana 3 test 3: 138459000 ns 138459 ms 0 s

QuickSort pivot random test 1: 151224000 ns 151224 ms 0 s

QuickSort pivot random test 2: 154311000 ns 154311 ms 0 s

QuickSort pivot random test 3: 149125000 ns 149125 ms 0 s

ShellSort test 1: 265832000 ns 265832 ms 0 s

ShellSort test 2: 269410000 ns 269410 ms 0 s

ShellSort test 3: 278370000 ns 278370 ms 0 s

HeapSort test 1: 298617000 ns 298617 ms 0 s

HeapSort test 2: 284341000 ns 284341 ms 0 s

HeapSort test 3: 268093000 ns 268093 ms 0 s

RadixSort baza 10 test 1: 62597000 ns 62597 ms 0 s

RadixSort baza 10 test 2: 67012000 ns 67012 ms 0 s

RadixSort baza 10 test 3: 67078000 ns 67078 ms 0 s

RadixSort baza 2^10 test 1: 31261000 ns 31261 ms 0 s

RadixSort baza 2^10 test 2: 29095000 ns 29095 ms 0 s

RadixSort baza 2^10 test 3: 29971000 ns 29971 ms 0 s

RadixSort baza 2^16 test 1: 29989000 ns 29989 ms 0 s

RadixSort baza 2^16 test 2: 28000000 ns 28000 ms 0 s

RadixSort baza 2^16 test 3: 29002000 ns 29002 ms 0 s

C++ sort test 1: 146309000 ns 146309 ms 0 s

C++ sort test 2: 137905000 ns 137905 ms 0 s

C++ sort test 3: 135212000 ns 135212 ms 0 s

Testul 7, n = 10^7, max = 10^3

MergeSort test 1: 1350739000 ns 1350739 ms 1 s

MergeSort test 2: 1337911000 ns 1337911 ms 1 s

MergeSort test 3: 1355926000 ns 1355926 ms 1 s

QuickSort mediana 3 test 1: 1014666000 ns 1014666 ms 1 s

QuickSort mediana 3 test 2: 1028880000 ns 1028880 ms 1 s

QuickSort mediana 3 test 3: 1029673000 ns 1029673 ms 1 s

QuickSort pivot random test 1: 1091664000 ns 1091664 ms 1 s

QuickSort pivot random test 2: 1136580000 ns 1136580 ms 1 s

QuickSort pivot random test 3: 1112821000 ns 1112821 ms 1 s

ShellSort test 1: 2248568000 ns 2248568 ms 2 s

ShellSort test 2: 2267092000 ns 2267092 ms 2 s

ShellSort test 3: 2286603000 ns 2286603 ms 2 s

HeapSort test 1: 4471308000 ns 4471308 ms 4 s

HeapSort test 2: 3567353000 ns 3567353 ms 3 s

HeapSort test 3: 3582925000 ns 3582925 ms 3 s

RadixSort baza 10 test 1: 446726000 ns 446726 ms 0 s

RadixSort baza 10 test 2: 433863000 ns 433863 ms 0 s

RadixSort baza 10 test 3: 404233000 ns 404233 ms 0 s

RadixSort baza 2^10 test 1: 120920000 ns 120920 ms 0 s

RadixSort baza 2^10 test 2: 109362000 ns 109362 ms 0 s

RadixSort baza 2^10 test 3: 125208000 ns 125208 ms 0 s

RadixSort baza 2^16 test 1: 133271000 ns 133271 ms 0 s

RadixSort baza 2^16 test 2: 117478000 ns 117478 ms 0 s

RadixSort baza 2^16 test 3: 120674000 ns 120674 ms 0 s

C++ sort test 1: 1179483000 ns 1179483 ms 1 s

C++ sort test 2: 1227509000 ns 1227509 ms 1 s

C++ sort test 3: 1276173000 ns 1276173 ms 1 s

Testul 8, n = 10^7, max = 10^5

MergeSort test 1: 1695701000 ns 1695701 ms 1 s

MergeSort test 2: 1557678000 ns 1557678 ms 1 s

MergeSort test 3: 1604869000 ns 1604869 ms 1 s

QuickSort mediana 3 test 1: 1486160000 ns 1486160 ms 1 s

QuickSort mediana 3 test 2: 1218316000 ns 1218316 ms 1 s

QuickSort mediana 3 test 3: 1225557000 ns 1225557 ms 1 s

QuickSort pivot random test 1: 1688525000 ns 1688525 ms 1 s

QuickSort pivot random test 2: 1376698000 ns 1376698 ms 1 s

QuickSort pivot random test 3: 1416996000 ns 1416996 ms 1 s

ShellSort test 1: 3778229000 ns 3778229 ms 3 s

ShellSort test 2: 3440815000 ns 3440815 ms 3 s

ShellSort test 3: 4071999000 ns 4071999 ms 4 s

HeapSort test 1: 4922844000 ns 4922844 ms 4 s

HeapSort test 2: 4584566000 ns 4584566 ms 4 s

HeapSort test 3: 4920163000 ns 4920163 ms 4 s

RadixSort baza 10 test 1: 847660000 ns 847660 ms 0 s

RadixSort baza 10 test 2: 625103000 ns 625103 ms 0 s

RadixSort baza 10 test 3: 620820000 ns 620820 ms 0 s

RadixSort baza 2^10 test 1: 302720000 ns 302720 ms 0 s

RadixSort baza 2^10 test 2: 212611000 ns 212611 ms 0 s

RadixSort baza 2^10 test 3: 309002000 ns 309002 ms 0 s

RadixSort baza 2^16 test 1: 289629000 ns 289629 ms 0 s

RadixSort baza 2^16 test 2: 280379000 ns 280379 ms 0 s

RadixSort baza 2^16 test 3: 286953000 ns 286953 ms 0 s

C++ sort test 1: 1478989000 ns 1478989 ms 1 s

C++ sort test 2: 1367874000 ns 1367874 ms 1 s

C++ sort test 3: 1892232000 ns 1892232 ms 1 s

Testul 9, n = 10^7, max = 10^8

MergeSort test 1: 1703044000 ns 1703044 ms 1 s

MergeSort test 2: 1743874000 ns 1743874 ms 1 s

MergeSort test 3: 1706283000 ns 1706283 ms 1 s

QuickSort mediana 3 test 1: 1993166000 ns 1993166 ms 1 s

QuickSort mediana 3 test 2: 1651200000 ns 1651200 ms 1 s

QuickSort mediana 3 test 3: 1554731000 ns 1554731 ms 1 s

QuickSort pivot random test 1: 1772238000 ns 1772238 ms 1 s

QuickSort pivot random test 2: 1895843000 ns 1895843 ms 1 s

QuickSort pivot random test 3: 1806386000 ns 1806386 ms 1 s

ShellSort test 1: 4980145000 ns 4980145 ms 4 s

ShellSort test 2: 4587693000 ns 4587693 ms 4 s

ShellSort test 3: 3804265000 ns 3804265 ms 3 s

HeapSort test 1: 4439981000 ns 4439981 ms 4 s

HeapSort test 2: 4882972000 ns 4882972 ms 4 s

HeapSort test 3: 5099768000 ns 5099768 ms 5 s

RadixSort baza 10 test 1: 817905000 ns 817905 ms 0 s

RadixSort baza 10 test 2: 809178000 ns 809178 ms 0 s

RadixSort baza 10 test 3: 774590000 ns 774590 ms 0 s

RadixSort baza 2^10 test 1: 286211000 ns 286211 ms 0 s

RadixSort baza 2^10 test 2: 307178000 ns 307178 ms 0 s

RadixSort baza 2^10 test 3: 297382000 ns 297382 ms 0 s

RadixSort baza 2^16 test 1: 302516000 ns 302516 ms 0 s

RadixSort baza 2^16 test 2: 294452000 ns 294452 ms 0 s

RadixSort baza 2^16 test 3: 282642000 ns 282642 ms 0 s

C++ sort test 1: 1549269000 ns 1549269 ms 1 s

C++ sort test 2: 1544522000 ns 1544522 ms 1 s

C++ sort test 3: 1567321000 ns 1567321 ms 1 s

Testul 10, n = 10^8, max = 10^3

MergeSort test 1: 20360293000 ns 20360293 ms 20 s

MergeSort test 2: 20408116000 ns 20408116 ms 20 s

MergeSort test 3: 20511563000 ns 20511563 ms 20 s

MergeSort test 4: 22310601000 ns 22310601 ms 22 s

MergeSort test 5: 23088166000 ns 23088166 ms 23 s

QuickSort mediana 3 test 1: 13156408000 ns 13156408 ms 13 s

QuickSort mediana 3 test 2: 15834094000 ns 15834094 ms 15 s

QuickSort mediana 3 test 3: 11541070000 ns 11541070 ms 11 s

QuickSort mediana 3 test 4: 14730179000 ns 14730179 ms 14 s

QuickSort mediana 3 test 5: 13804148000 ns 13804148 ms 13 s

QuickSort pivot random test 1: 16808807000 ns 16808807 ms 16 s

QuickSort pivot random test 2: 19942597000 ns 19942597 ms 19 s

QuickSort pivot random test 3: 12329979000 ns 12329979 ms 12 s

QuickSort pivot random test 4: 14131601000 ns 14131601 ms 14 s

QuickSort pivot random test 5: 14538765000 ns 14538765 ms 14 s

ShellSort test 1: 27999024000 ns 27999024 ms 27 s

ShellSort test 2: 35359954000 ns 35359954 ms 35 s

ShellSort test 3: 25052895000 ns 25052895 ms 25 s

ShellSort test 4: 28301880000 ns 28301880 ms 28 s

ShellSort test 5: 29383621000 ns 29383621 ms 29 s

HeapSort test 1: 60530376000 ns 60530376 ms 60 s

HeapSort test 2: 65860144000 ns 65860144 ms 65 s

HeapSort test 3: 58931784000 ns 58931784 ms 58 s

HeapSort test 4: 47882299000 ns 47882299 ms 47 s

HeapSort test 5: 52168393000 ns 52168393 ms 52 s

RadixSort baza 10 test 1: 5590923000 ns 5590923 ms 5 s

RadixSort baza 10 test 2: 5945889000 ns 5945889 ms 5 s

RadixSort baza 10 test 3: 4363275000 ns 4363275 ms 4 s

RadixSort baza 10 test 4: 4475000000 ns 4475000 ms 4 s

RadixSort baza 10 test 5: 4462412000 ns 4462412 ms 4 s

RadixSort baza 2^10 test 1: 4182630000 ns 4182630 ms 4 s

RadixSort baza 2^10 test 2: 5616496000 ns 5616496 ms 5 s

RadixSort baza 2^10 test 3: 1690233000 ns 1690233 ms 1 s

RadixSort baza 2^10 test 4: 1327545000 ns 1327545 ms 1 s

RadixSort baza 2^10 test 5: 1421789000 ns 1421789 ms 1 s

RadixSort baza 2^16 test 1: 1676230000 ns 1676230 ms 1 s

RadixSort baza 2^16 test 2: 1692987000 ns 1692987 ms 1 s

RadixSort baza 2^16 test 3: 1503451000 ns 1503451 ms 1 s

RadixSort baza 2^16 test 4: 1490732000 ns 1490732 ms 1 s

RadixSort baza 2^16 test 5: 1319699000 ns 1319699 ms 1 s

C++ sort test 1: 18552863000 ns 18552863 ms 18 s

C++ sort test 2: 13762090000 ns 13762090 ms 13 s

C++ sort test 3: 21236761000 ns 21236761 ms 21 s

C++ sort tes t4: 15147565000 ns 15147565 ms 15 s

C++ sort test 5: 15070370000 ns 15070370 ms 15 s

Testul 11, n = 10^8, max = 10^7

MergeSort test 1: 18864604000 ns 18864604 ms 18 s

MergeSort test 2: 22574642000 ns 22574642 ms 22 s

MergeSort test 3: 20730150000 ns 20730150 ms 20 s

MergeSort test 4: 18676997000 ns 18676997 ms 18 s

MergeSort test 5: 18650685000 ns 18650685 ms 18 s

QuickSort mediana 3 test 1: 15053118000 ns 15053118 ms 15 s

QuickSort mediana 3 test 2: 15199831000 ns 15199831 ms 15 s

QuickSort mediana 3 test 3: 15029744000 ns 15029744 ms 15 s

QuickSort mediana 3 test 4: 15040454000 ns 15040454 ms 15 s

QuickSort mediana 3 test 5: 17042109000 ns 17042109 ms 17 s

QuickSort pivot random test 1: 16798100000 ns 16798100 ms 16 s

QuickSort pivot random test 2: 16935124000 ns 16935124 ms 16 s

QuickSort pivot random test 3: 19580562000 ns 19580562 ms 19 s

QuickSort pivot random test 4: 16764203000 ns 16764203 ms 16 s

QuickSort pivot random test 5: 18546696000 ns 18546696 ms 18 s

ShellSort test 1: 55076015000 ns 55076015 ms 55 s

ShellSort test 2: 60689819000 ns 60689819 ms 60 s

ShellSort test 3: 58812429000 ns 58812429 ms 58 s

ShellSort test 4: 57442643000 ns 57442643 ms 57 s

ShellSort test 5: 54145214000 ns 54145214 ms 54 s

HeapSort test 1: 75080142000 ns 75080142 ms 75 s

HeapSort test 2: 69294209000 ns 69294209 ms 69 s

HeapSort test 3: 7755365000 ns 7755365 ms 72 s

HeapSort test 4: 72474676000 ns 72474676 ms 72 s

HeapSort test 5: 72708945000 ns 72708945 ms 72 s

RadixSort baza 10 test 1: 7623779000 ns 7623779 ms 7 s

RadixSort baza 10 test 2: 7635148000 ns 7635148 ms 7 s

RadixSort baza 10 test 3: 7755365000 ns 7755365 ms 7 s

RadixSort baza 10 test 4: 7650113000 ns 7650113 ms 7 s

RadixSort baza 10 test 5: 8339634000 ns 8339634 ms 8 s

RadixSort baza 2^10 test 1: 2973560000 ns 2973560 ms 2 s

RadixSort baza 2^10 test 2: 2933855000 ns 2933855 ms 2 s

RadixSort baza 2^10 test 3: 2994776000 ns 2994776 ms 2 s

RadixSort baza 2^10 test 4: 3256096000 ns 3256096 ms 3 s

RadixSort baza 2^10 test 5: 3206495000 ns 3206495 ms 3 s

RadixSort baza 2^16 test 1: 2889904000 ns 2889904 ms 2 s

RadixSort baza 2^16 test 2: 3214687000 ns 3214687 ms 3 s

RadixSort baza 2^16 test 3: 3250025000 ns 3250025 ms 3 s

RadixSort baza 2^16 test 4: 3199666000 ns 3199666 ms 3 s

RadixSort baza 2^16 test 5: 3197261000 ns 3197261 ms 3 s

C++ sort test 1: 18904535000 ns 18904535 ms 18 s

C++ sort test 2: 17008673000 ns 17008673 ms 17 s

C++ sort test 3: 16977791000 ns 16977791 ms 16 s

C++ sort test 4: 17727554000 ns 17727554 ms 17 s

C++ sort test 5: 21116810000 ns 21116810 ms 21 s

Testul 12, n = 10^8, max = 10^8

MergeSort test 1: 22259574000 ns 22259574 ms 22 s

MergeSort test 2: 19517236000 ns 19517236 ms 19 s

MergeSort test 3: 19565275000 ns 19565275 ms 19 s

MergeSort test 4: 21277760000 ns 21277760 ms 21 s

MergeSort test 5: 19716083000 ns 19716083 ms 19 s

QuickSort mediana 3 test 1: 20832823000 ns 20832823 ms 20 s

QuickSort mediana 3 test 2: 19323697000 ns 19323697 ms 19 s

QuickSort mediana 3 test 3: 18098336000 ns 18098336 ms 18 s

QuickSort mediana 3 test 4: 17678853000 ns 17678853 ms 17 s

QuickSort mediana 3 test 5: 16229054000 ns 16229054 ms 16 s

QuickSort pivot random test 1: 27582636000 ns 27582636 ms 27 s

QuickSort pivot random test 2: 19185218000 ns 19185218 ms 19 s

QuickSort pivot random test 3: 20147156000 ns 20147156 ms 20 s

QuickSort pivot random test 4: 23849532000 ns 23849532 ms 23 s

QuickSort pivot random test 5: 21316583000 ns 21316583 ms 21 s

ShellSort test 1: 66128597000 ns 66128597 ms 66 s

ShellSort test 2: 61916721000 ns 61916721 ms 61 s

ShellSort test 3: 57394006000 ns 57394006 ms 57 s

ShellSort test 4: 59862403000 ns 59862403 ms 59 s

ShellSort test 5: 57809781000 ns 57809781 ms 57 s

HeapSort test 1: 72385475000 ns 72385475 ms 72 s

HeapSort test 2: 70647731000 ns 70647731 ms 70 s

HeapSort test 3: 77776390000 ns 77776390 ms 77 s

HeapSort test 4: 75745071000 ns 75745071 ms 75 s

HeapSort test 5: 72443140000 ns 72443140 ms 72 s

RadixSort baza 10 test 1: 8680198000 ns 8680198 ms 8 s

RadixSort baza 10 test 2: 8279805000 ns 8279805 ms 8 s

RadixSort baza 10 test 3: 8229733000 ns 8229733 ms 8 s

RadixSort baza 10 test 4: 8148881000 ns 8148881 ms 8 s

RadixSort baza 10 test 5: 8465146000 ns 8465146 ms 8 s

RadixSort baza 2^10 test 1: 3125959000 ns 3125959 ms 3 s

RadixSort baza 2^10 test 2: 3107631000 ns 3107631 ms 3 s

RadixSort baza 2^10 test 3: 3047674000 ns 3047674 ms 3 s

RadixSort baza 2^10 test 4: 3212941000 ns 3212941 ms 3 s

RadixSort baza 2^10 test 5: 2951814000 ns 2951814 ms 2 s

RadixSort baza 2^16 test 1: 3475405000 ns 3475405 ms 3 s

RadixSort baza 2^16 test 2: 3280758000 ns 3280758 ms 3 s

RadixSort baza 2^16 test 3: 3214654000 ns 3214654 ms 3 s

RadixSort baza 2^16 test 4: 3165742000 ns 3165742 ms 3 s

RadixSort baza 2^16 test 5: 2893400000 ns 2893400 ms 2 s

C++ sort test 1: 16874472000 ns 16874472 ms 16 s

C++ sort test 2: 19853762000 ns 19853762 ms 19 s

C++ sort test 3: 17639379000 ns 17639379 ms 17 s

C++ sort test 4: 33203532000 ns 33203532 ms 33 s

C++ sort test 5: 17655293000 ns 17655293 ms 17 s

Testul 13, n = 10^6, max = 1 (doar 1)

MergeSort test 1: 82335000 ns 82335 ms 0 s

MergeSort test 2: 81674000 ns 81674 ms 0 s

QuickSort mediana 3 test 1: 57002000 ns 57002 ms 0 s

QuickSort mediana 3 test 2: 60797000 ns 60797 ms 0 s

QuickSort pivot random test 1: 62999000 ns 62999 ms 0 s

QuickSort pivot random test 2: 66089000 ns 66089 ms 0 s

ShellSort test 1: 48395000 ns 48395 ms 0 s

ShellSort test 2: 44171000 ns 44171 ms 0 s

HeapSort test 1: 7999000 ns 7999 ms 0 s

HeapSort test 2: 8894000 ns 8894 ms 0 s

RadixSort baza 10 test 1: 12017000 ns 12017 ms 0 s

RadixSort baza 10 test 2: 12993000 ns 12993 ms 0 s

RadixSort baza 2^10 test 1: 12021000 ns 12021 ms 0 s

RadixSort baza 2^10 test 2: 12001000 ns 12001 ms 0 s

RadixSort baza 2^16 test 1: 12002000 ns 12002 ms 0 s

RadixSort baza 2^16 test 2: 11902000 ns 11902 ms 0 s

C++ sort test 1: 78207000 ns 78207 ms 0 s

C++ sort test 2: 87357000 ns 87357 ms 0 s

Testul 14, n = 10^7, max = 10^7 strict crescator

MergeSort test 1: 924524000 ns 924524 ms 0 s

MergeSort test 2: 931274000 ns 931274 ms 0 s

QuickSort mediana 3 test 1: 409875000 ns 409875 ms 0 s

QuickSort mediana 3 test 2: 433475000 ns 433475 ms 0 s

QuickSort pivot random test 1: 6719616000 ns 6719616 ms 6 s

QuickSort pivot random test 2: 7263199000 ns 7263199 ms 7 s

ShellSort test 1: 509856000 ns 509856 ms 0 s

ShellSort test 2: 513913000 ns 513913 ms 0 s

HeapSort test 1: 2496870000 ns 2496870 ms 2 s

HeapSort test 2: 3165694000 ns 3165694 ms 3 s

RadixSort baza 10 test 1: 778486000 ns 778486 ms 0 s

RadixSort baza 10 test 2: 869954000 ns 869954 ms 0 s

RadixSort baza 2^10 test 1: 420273000 ns 420273 ms 0 s

RadixSort baza 2^10 test 2: 393800000 ns 393800 ms 0 s

RadixSort baza 2^16 test 1: 554231000 ns 554231 ms 0 s

RadixSort baza 2^16 test 2: 506628000 ns 506628 ms 0 s

C++ sort test 1: 707197000 ns 707197 ms 0 s

C++ sort test 2: 741156000 ns 741156 ms 0 s

Testul 15, n = 10^7, max = 10^7 strict descrescator

MergeSort test 1: 917631000 ns 917631 ms 0 s

MergeSort test 2: 916005000 ns 916005 ms 0 s

QuickSort mediana 3 test 1: 423060000 ns 423060 ms 0 s

QuickSort mediana 3 test 2: 418561000 ns 418561 ms 0 s

QuickSort pivot random test 1: 5966438000 ns 5966438 ms 5 s

QuickSort pivot random test 2: 6337832000 ns 6337832 ms 6 s

ShellSort test 1: 768011000 ns 768011 ms 0 s

ShellSort test 2: 968795000 ns 968795 ms 0 s

HeapSort test 1: 2470697000 ns 2470697 ms 2 s

HeapSort test 2: 3027228000 ns 3027228 ms 3 s

RadixSort baza 10 test 1: 848151000 ns 848151 ms 0 s

RadixSort baza 10 test 2: 942896000 ns 942896 ms 0 s

RadixSort baza 2^10 test 1: 394122000 ns 394122 ms 0 s

RadixSort baza 2^10 test 2: 388875000 ns 388875 ms 0 s

RadixSort baza 2^16 test 1: 484834000 ns 484834 ms 0 s

RadixSort baza 2^16 test 2: 475323000 ns 475323 ms 0 s

C++ sort test 1: 540445000 ns 540445 ms 0 s

C++ sort test 2: 551299000 ns 551299 ms 0 s