

Sorting Algorithm Analysis Report

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Sorting Algorithm Experimentation

Insertion Sort

Action

Create an array of 30 elements and execute the insertion sort on the array.

Result

Array size: 30

Sorting Method: InsertionSort

reading id: -1923761 loc: North West windspeed: 0.6527969871473817 km/h temperature: 137.20732058250525 degrees
reading id: -1025410859 loc: South West windspeed: 5.718781454568938 km/h temperature: 59.00216336317018 degrees
reading id: -1630169924 loc: South West windspeed: 6.4381389277292715 km/h temperature: 53.5133179027723 degrees
reading id: -748347791 loc: North East windspeed: 12.202551415532591 km/h temperature: 131.86550113834053 degrees
reading id: -888673667 loc: South West windspeed: 15.580955428564629 km/h temperature: 115.13373088899856 degrees
reading id: -410925805 loc: North West windspeed: 22.880863279990695 km/h temperature: 108.83712624522808 degrees
reading id: -1187289757 loc: North East windspeed: 26.24121072082103 km/h temperature: 140.21802013895746 degrees
reading id: -2143772999 loc: South East windspeed: 50.5388857681348 km/h temperature: 138.01221308757118 degrees
reading id: -1932098545 loc: South East windspeed: 58.49590428344889 km/h temperature: 115.75345405462744 degrees
reading id: -1118547056 loc: South East windspeed: 59.83299614779075 km/h temperature: 81.3681430097821 degrees
reading id: -1014308945 loc: South East windspeed: 66.42097046278363 km/h temperature: 50.893917579760995 degrees
reading id: -320741231 loc: South West windspeed: 75.52248662418674 km/h temperature: 113.26567924739888 degrees
reading id: -1348496453 loc: South East windspeed: 80.93748088273175 km/h temperature: 83.53067685568953 degrees
reading id: -1531869019 loc: South West windspeed: 82.97919847526022 km/h temperature: 63.7209632295787 degrees
reading id: -1294336726 loc: North East windspeed: 84.11133947934417 km/h temperature: 131.09993939902432 degrees
reading id: -421390854 loc: South West windspeed: 89.93938778341087 km/h temperature: 129.0552761060539 degrees
reading id: -1293845303 loc: South West windspeed: 91.3103124113707 km/h temperature: 83.94055368668447 degrees
reading id: -729478812 loc: North West windspeed: 92.21773959424738 km/h temperature: 127.07675358403462 degrees
reading id: -953618144 loc: North West windspeed: 97.29356744898584 km/h temperature: 123.60039389150839 degrees
reading id: -315810223 loc: North West windspeed: 102.6433765897091 km/h temperature: 118.45300339225989 degrees
reading id: -15908909 loc: South East windspeed: 104.27346575411279 km/h temperature: 125.13347896844923 degrees
reading id: -1725407831 loc: North East windspeed: 110.73094579554979 km/h temperature: 107.4964851390173 degrees
reading id: -1717325948 loc: North West windspeed: 110.90198286614518 km/h temperature: 135.28599031632558 degrees
reading id: -397377314 loc: North West windspeed: 113.35743126033478 km/h temperature: 138.6675963249197 degrees
reading id: -1358132618 loc: South West windspeed: 113.62429445414413 km/h temperature: 71.4921018859062 degrees
reading id: -714261995 loc: South East windspeed: 115.74011055868105 km/h temperature: 83.92422793311293 degrees
reading id: -164070803 loc: South East windspeed: 119.98350828700654 km/h temperature: 57.63107165216134 degrees
reading id: -119130058 loc: South East windspeed: 134.19134255412737 km/h temperature: 126.39827975393919 degrees
reading id: -1428117589 loc: North East windspeed: 137.2738230515368 km/h temperature: 107.67669044191223 degrees
reading id: -931461820 loc: North West windspeed: 143.52657346171165 km/h temperature: 107.6868959448711 degrees

Execution time is 101700 nanoseconds.

Merge Sort

Action

Create an array of 30 elements and execute the insertion sort on the array.

Result

Array size: 30
Sorting Method: MergeSort

reading id: -505596517 loc: South West windspeed: 0.34151762961899523 km/h temperature: 55.81918555787873 degrees
reading id: -767198677 loc: South West windspeed: 13.31815090989811 km/h temperature: 82.75501357631768 degrees
reading id: -652443438 loc: South East windspeed: 16.305364190415162 km/h temperature: 106.89416847533141 degrees
reading id: -202004709 loc: North East windspeed: 18.477425875082165 km/h temperature: 84.83255198978358 degrees
reading id: -769186702 loc: South West windspeed: 23.198878097161497 km/h temperature: 62.48130708036688 degrees
reading id: -1732978477 loc: North East windspeed: 34.51133122745808 km/h temperature: 127.64465465848244 degrees
reading id: -1310046346 loc: South West windspeed: 38.402378016657295 km/h temperature: 124.05310503157058 degrees
reading id: -408126101 loc: North West windspeed: 41.14275476354045 km/h temperature: 99.71730320296385 degrees
reading id: -440241151 loc: South West windspeed: 50.0007280181521 km/h temperature: 137.45600008224477 degrees
reading id: -569157100 loc: North East windspeed: 50.5569044567298 km/h temperature: 58.454429416333 degrees
reading id: -1493493676 loc: North West windspeed: 63.21144573896777 km/h temperature: 53.76497225139739 degrees
reading id: -1797469380 loc: South West windspeed: 63.218358935943755 km/h temperature: 60.041109236533714 degrees
reading id: -1098316737 loc: North West windspeed: 63.56651401361285 km/h temperature: 112.12752819045627 degrees
reading id: -2092018210 loc: South East windspeed: 69.06379357682783 km/h temperature: 100.97339067713948 degrees
reading id: -1833351891 loc: North West windspeed: 72.22786226485886 km/h temperature: 74.5534953765876 degrees
reading id: -280884375 loc: North East windspeed: 78.22277822031691 km/h temperature: 87.11560712809658 degrees
reading id: -538095282 loc: South West windspeed: 79.37890281251597 km/h temperature: 50.42129949503149 degrees
reading id: -1630916584 loc: South West windspeed: 84.38172691037875 km/h temperature: 58.2889686513102 degrees
reading id: -67151533 loc: South West windspeed: 84.64420789210766 km/h temperature: 108.27954728393809 degrees
reading id: -829359481 loc: South West windspeed: 91.6807080744421 km/h temperature: 121.46819067422378 degrees
reading id: -1618239110 loc: North East windspeed: 93.83336582208287 km/h temperature: 56.05295979640602 degrees
reading id: -1846939 loc: North West windspeed: 103.06436595830682 km/h temperature: 113.75312702684923 degrees
reading id: -311707741 loc: South West windspeed: 105.68407398315581 km/h temperature: 118.39165743593426 degrees
reading id: -1105183008 loc: North West windspeed: 106.7485535383097 km/h temperature: 125.30322412590526 degrees
reading id: -696465623 loc: North East windspeed: 115.88388207575103 km/h temperature: 77.76595598812261 degrees
reading id: -1731792725 loc: North West windspeed: 127.54852222186845 km/h temperature: 59.036122293928685 degrees
reading id: -1837374705 loc: South West windspeed: 137.78880937426004 km/h temperature: 76.22696415861418 degrees
reading id: -1497763268 loc: North East windspeed: 143.10670420086802 km/h temperature: 102.41420745210569 degrees
reading id: -275407157 loc: South East windspeed: 145.00051751660234 km/h temperature: 129.42815299472795 degrees
reading id: -1656995626 loc: North East windspeed: 150.1252243727118 km/h temperature: 133.15595489903092 degrees

Execution time is 239400 nanoseconds.

Insertion Sort

Action

Create an array of 300 elements and execute the insertion sort on the array.

Result

Array size: 300

Sorting Method: InsertionSort

reading id: -171657968 loc: South West windspeed: 1.8835692344148929 km/h temperature: 101.95973199874464 degrees
reading id: -1878917264 loc: North West windspeed: 1.9295922707789033 km/h temperature: 126.40226898392699 degrees
reading id: -1497879268 loc: North West windspeed: 1.9595411363185418 km/h temperature: 71.48934905397422 degrees
reading id: -744436772 loc: South West windspeed: 2.231949952727497 km/h temperature: 52.03222976710321 degrees
reading id: -1473541298 loc: South West windspeed: 3.090655248198389 km/h temperature: 81.49041447937996 degrees
reading id: -718267584 loc: South East windspeed: 3.9340125715547996 km/h temperature: 101.81017413078371 degrees
reading id: -1700154881 loc: South East windspeed: 4.766231903671011 km/h temperature: 60.29682352489749 degrees
reading id: -1791293362 loc: North West windspeed: 5.06960302400177 km/h temperature: 93.83833045807803 degrees
reading id: -1060880818 loc: South East windspeed: 5.353290967771206 km/h temperature: 121.91093775766792 degrees
reading id: -652639116 loc: South East windspeed: 5.625037597356992 km/h temperature: 103.75252600682848 degrees
reading id: -637732104 loc: South West windspeed: 6.018526820157437 km/h temperature: 110.65676812402563 degrees
reading id: -136779405 loc: North West windspeed: 6.839215034973398 km/h temperature: 61.277894731636806 degrees
reading id: -1582573113 loc: South East windspeed: 6.839436805749148 km/h temperature: 85.11645219158098 degrees
reading id: -1282777206 loc: North East windspeed: 6.882274066547244 km/h temperature: 135.72775692508466 degrees
reading id: -2061617762 loc: South East windspeed: 7.569975337978259 km/h temperature: 105.52872328832595 degrees
reading id: -414132818 loc: South East windspeed: 7.744769068799582 km/h temperature: 81.25594842199382 degrees
...
reading id: -340094392 loc: South East windspeed: 141.1457862209711 km/h temperature: 79.51195102511738 degrees
reading id: -1210241714 loc: North East windspeed: 142.21039767012917 km/h temperature: 56.52775451080036 degrees
reading id: -1596373843 loc: South East windspeed: 142.2971135341421 km/h temperature: 100.02873742811889 degrees
reading id: -706240077 loc: South East windspeed: 143.1273255252131 km/h temperature: 71.03374815560085 degrees
reading id: -1055970453 loc: South East windspeed: 143.37567354684774 km/h temperature: 51.441258928770495 degrees
reading id: -2036466043 loc: South West windspeed: 144.45680342842695 km/h temperature: 128.02452880541938 degrees
reading id: -2018525568 loc: North West windspeed: 145.56719009503055 km/h temperature: 59.488962102069245 degrees
reading id: -1226820622 loc: South East windspeed: 146.0646053389611 km/h temperature: 60.39780374945826 degrees
reading id: -1086168137 loc: North West windspeed: 146.10572606321227 km/h temperature: 139.13968418262453 degrees
reading id: -373825499 loc: South East windspeed: 146.99906462344043 km/h temperature: 104.86862663110307 degrees
reading id: -1166082155 loc: North East windspeed: 148.28036922283434 km/h temperature: 120.8136856036239 degrees
reading id: -452128429 loc: North East windspeed: 150.27087569495035 km/h temperature: 70.1712981009871 degrees
reading id: -499828556 loc: South West windspeed: 150.51943663217241 km/h temperature: 96.92315712540773 degrees
reading id: -1443518240 loc: South East windspeed: 150.8948723967098 km/h temperature: 106.15051303527898 degrees

Execution time is 2481000 nanoseconds.

Merge Sort

Action

Create an array of 300 elements and execute the insertion sort on the array.

Result

Array size: 300
Sorting Method: MergeSort

reading id: -1854329320 loc: North East windspeed: 0.20264792459545755 km/h temperature: 127.3579647054859 degrees
reading id: -530214761 loc: South West windspeed: 0.27783026998263893 km/h temperature: 79.73720636496576 degrees
reading id: -942560062 loc: South East windspeed: 0.8123705042792603 km/h temperature: 132.58422355052954 degrees
reading id: -1623494416 loc: North West windspeed: 1.200220047254744 km/h temperature: 106.82764294321856 degrees
reading id: -1449211993 loc: South West windspeed: 1.9046992131982137 km/h temperature: 79.11088521050382 degrees
reading id: -1986061672 loc: South East windspeed: 3.000742518097916 km/h temperature: 64.07076623485902 degrees
reading id: -1996665826 loc: South West windspeed: 3.076802966296654 km/h temperature: 116.61739378388884 degrees
reading id: -866882769 loc: South East windspeed: 3.804009612352187 km/h temperature: 73.13130967183768 degrees
reading id: -670170483 loc: North West windspeed: 3.976933199844502 km/h temperature: 68.09189906190053 degrees
reading id: -276844333 loc: South East windspeed: 4.322094643826112 km/h temperature: 63.49098411070135 degrees
reading id: -785742396 loc: North West windspeed: 4.475331575056165 km/h temperature: 68.60934001054574 degrees
reading id: -1586784280 loc: North East windspeed: 4.954557310047609 km/h temperature: 58.05638262402694 degrees
reading id: -781378293 loc: North East windspeed: 5.299609291494846 km/h temperature: 109.23986849685049 degrees
reading id: -1318363684 loc: North West windspeed: 5.535223524856717 km/h temperature: 128.27126296678313 degrees
reading id: -218549786 loc: South West windspeed: 5.831894032949774 km/h temperature: 61.62587546044451 degrees
reading id: -266527621 loc: South East windspeed: 6.1436332648983845 km/h temperature: 82.8252524733883 degrees
...
reading id: -496061792 loc: South East windspeed: 144.31829348861888 km/h temperature: 66.90639911875637 degrees
reading id: -377602438 loc: North West windspeed: 145.98587560015116 km/h temperature: 92.15836780024111 degrees
reading id: -871901846 loc: South West windspeed: 146.72817959638652 km/h temperature: 78.31661553761039 degrees
reading id: -417464612 loc: South East windspeed: 146.76579318787003 km/h temperature: 79.1151954097305 degrees
reading id: -631217216 loc: South West windspeed: 147.29848964758153 km/h temperature: 85.84373274878119 degrees
reading id: -2056348281 loc: North West windspeed: 148.54375406247158 km/h temperature: 137.80442535015106 degrees
reading id: -193250926 loc: South East windspeed: 148.8989839944145 km/h temperature: 97.16053485417265 degrees
reading id: -1537772888 loc: South East windspeed: 149.6115793455628 km/h temperature: 72.4236996810537 degrees
reading id: -1649358972 loc: North West windspeed: 149.80165856222737 km/h temperature: 119.28614968679828 degrees
reading id: -1903612545 loc: South East windspeed: 149.9756766927186 km/h temperature: 137.99533954093658 degrees
reading id: -1105363797 loc: South East windspeed: 150.19357060710976 km/h temperature: 125.73824412067712 degrees
reading id: -2097375199 loc: South East windspeed: 150.19887909910486 km/h temperature: 131.5020301289411 degrees
reading id: -722825834 loc: South West windspeed: 150.283632609839 km/h temperature: 123.56688678756115 degrees

Execution time is 1498400 nanoseconds.

Conclusion

The results have shown that insertion sort performs better on a small-sized array than merge sort due to fewer overheads. However, on a large-sized array, merge sort has performed better than insertion sort with its overheads helping out to speed up the sorting process.