

Sorting Algorithm Analysis Report

Student Number: 141907196

Student Name: Andrew Jun Wai Ip

Date of completion: 2019 – 11 – 22

Results

Array Size 50 Merge Sort Time to execute: 173200 Nano seconds

reading id: 48 loc: North West windspeed: 1.7554503183901566 km/h temperature: 51.97476363117062 degrees
reading id: 4 loc: North West windspeed: 4.688939518385533 km/h temperature: 108.09019103710696 degrees
reading id: 8 loc: North East windspeed: 5.163891283788438 km/h temperature: 134.0582010355036 degrees
reading id: 20 loc: South West windspeed: 5.491380068664124 km/h temperature: 135.6471140065718 degrees
reading id: 43 loc: South West windspeed: 11.359059232127429 km/h temperature: 80.23784153177411 degrees
reading id: 2 loc: North East windspeed: 12.603521964495126 km/h temperature: 104.49228108443072 degrees
reading id: 22 loc: North East windspeed: 16.841560509190952 km/h temperature: 114.81659095377796 degrees
reading id: 13 loc: North East windspeed: 17.841495629741534 km/h temperature: 119.54635477655768 degrees
reading id: 15 loc: North East windspeed: 18.986926138659634 km/h temperature: 140.64196072787993 degrees
reading id: 46 loc: North West windspeed: 20.962933760305276 km/h temperature: 58.0788645825224 degrees
reading id: 36 loc: North East windspeed: 25.783295143534456 km/h temperature: 57.720529180976214 degrees
reading id: 29 loc: South West windspeed: 37.66194339037048 km/h temperature: 89.34714545447497 degrees
reading id: 18 loc: North West windspeed: 44.07222933122594 km/h temperature: 86.60659947183115 degrees
reading id: 30 loc: South West windspeed: 49.94764204452763 km/h temperature: 64.46422099206576 degrees
reading id: 26 loc: South West windspeed: 51.11670447378124 km/h temperature: 117.56051284713546 degrees
reading id: 41 loc: North West windspeed: 53.512843394983875 km/h temperature: 125.11184550868231 degrees
reading id: 16 loc: South West windspeed: 61.62848306978402 km/h temperature: 88.20353488438033 degrees
reading id: 47 loc: North East windspeed: 63.07339356519684 km/h temperature: 73.53723291407114 degrees
reading id: 50 loc: North West windspeed: 64.59528417871198 km/h temperature: 93.83710994612656 degrees
reading id: 49 loc: South West windspeed: 65.73949877550999 km/h temperature: 52.760589297275516 degrees
reading id: 9 loc: North East windspeed: 66.08259697784248 km/h temperature: 122.83075060104935 degrees
reading id: 33 loc: South West windspeed: 66.96858281194613 km/h temperature: 112.25699492134912 degrees
reading id: 37 loc: South West windspeed: 67.87745613695895 km/h temperature: 50.26625540320468 degrees
reading id: 24 loc: North West windspeed: 74.84604682242485 km/h temperature: 81.50614397371197 degrees
reading id: 1 loc: South West windspeed: 77.43432027081582 km/h temperature: 54.17370659630571 degrees
reading id: 11 loc: North West windspeed: 82.52876260663218 km/h temperature: 80.0428875662878 degrees
reading id: 38 loc: North West windspeed: 85.41445663805297 km/h temperature: 60.645946981064434 degrees
reading id: 5 loc: North East windspeed: 87.0655763277738 km/h temperature: 74.4676488758956 degrees
reading id: 44 loc: North East windspeed: 93.34838800526022 km/h temperature: 116.23171719332763 degrees
reading id: 27 loc: North West windspeed: 94.52599658744039 km/h temperature: 64.69500209790479 degrees
reading id: 14 loc: North West windspeed: 98.36738654742571 km/h temperature: 62.917489440558896 degrees
reading id: 28 loc: North East windspeed: 100.15453463330407 km/h temperature: 97.67246984258432 degrees
reading id: 21 loc: North East windspeed: 104.69459064202967 km/h temperature: 62.54287050971679 degrees
reading id: 32 loc: North West windspeed: 108.83274008431418 km/h temperature: 118.20304795425378 degrees
reading id: 40 loc: South West windspeed: 115.62934336037648 km/h temperature: 89.29374630272449 degrees
reading id: 10 loc: North West windspeed: 120.36735895063332 km/h temperature: 75.55847879258555 degrees
reading id: 35 loc: North East windspeed: 124.78569565476717 km/h temperature: 100.81483533422612 degrees
reading id: 6 loc: North West windspeed: 125.75118576053016 km/h temperature: 60.42266996871653 degrees
reading id: 25 loc: North East windspeed: 126.19050451750294 km/h temperature: 119.09054433155363 degrees
reading id: 17 loc: North East windspeed: 128.7648756939462 km/h temperature: 77.27197054512132 degrees
reading id: 42 loc: North East windspeed: 130.44806274508662 km/h temperature: 85.50725927755403 degrees
reading id: 19 loc: North West windspeed: 134.24027636080726 km/h temperature: 75.49771207870262 degrees
reading id: 7 loc: North West windspeed: 135.22321621357003 km/h temperature: 127.70635179548277 degrees
reading id: 3 loc: North West windspeed: 136.96909534952124 km/h temperature: 134.96090039369852 degrees
reading id: 12 loc: South West windspeed: 137.96788625059727 km/h temperature: 76.84443526056809 degrees
reading id: 31 loc: South West windspeed: 138.39620110561134 km/h temperature: 134.80886456312797 degrees
reading id: 23 loc: North East windspeed: 140.23453530458505 km/h temperature: 67.15097992487475 degrees
reading id: 45 loc: North West windspeed: 145.68571770296245 km/h temperature: 59.78072037660969 degrees
reading id: 34 loc: North West windspeed: 146.82832064004867 km/h temperature: 128.66774076782832 degrees
reading id: 39 loc: South West windspeed: 148.80849662461569 km/h temperature: 55.50564952388555 degrees

Array Size 50 Insertion Sort 119199 Nano seconds

reading id: 49 loc: South West windspeed: 1.3372611224515656 km/h temperature: 126.67356727584297 degrees
reading id: 42 loc: South West windspeed: 4.046640462533378 km/h temperature: 63.01409342843964 degrees
reading id: 31 loc: South West windspeed: 4.354395354397751 km/h temperature: 73.84385676072024 degrees
reading id: 4 loc: South West windspeed: 10.6604792960244 km/h temperature: 50.54633577583904 degrees
reading id: 12 loc: South West windspeed: 12.874803979135528 km/h temperature: 80.7700860996446 degrees
reading id: 7 loc: North East windspeed: 12.888657194633902 km/h temperature: 109.16746912592234 degrees
reading id: 1 loc: North East windspeed: 14.312958284047374 km/h temperature: 91.96993115348309 degrees
reading id: 41 loc: North West windspeed: 19.58190508640183 km/h temperature: 120.62058336414925 degrees
reading id: 46 loc: South West windspeed: 22.149017310624256 km/h temperature: 101.38876357812669 degrees
reading id: 36 loc: North West windspeed: 23.314011535628637 km/h temperature: 120.9033283565609 degrees
reading id: 28 loc: South West windspeed: 33.38068583304212 km/h temperature: 80.89990372234793 degrees
reading id: 17 loc: North East windspeed: 34.31068152580482 km/h temperature: 52.94700336560979 degrees
reading id: 14 loc: North West windspeed: 34.46911610802975 km/h temperature: 50.610338246921444 degrees
reading id: 34 loc: South West windspeed: 34.56912619628297 km/h temperature: 99.84014043195825 degrees
reading id: 16 loc: North East windspeed: 36.061464865419275 km/h temperature: 112.11505286735854 degrees
reading id: 48 loc: South West windspeed: 44.07057968176914 km/h temperature: 60.463898606013515 degrees
reading id: 24 loc: North East windspeed: 45.56624346879639 km/h temperature: 83.7827568265574 degrees
reading id: 35 loc: North West windspeed: 51.18761804935788 km/h temperature: 97.44642400657995 degrees
reading id: 26 loc: North West windspeed: 56.04548088698089 km/h temperature: 66.28509560901253 degrees
reading id: 25 loc: South West windspeed: 57.808681927557224 km/h temperature: 95.0845306058319 degrees
reading id: 27 loc: North West windspeed: 57.920456233215255 km/h temperature: 93.42381188664952 degrees
reading id: 13 loc: North East windspeed: 66.0050153237097 km/h temperature: 52.23141965752568 degrees
reading id: 50 loc: North East windspeed: 67.17884644451927 km/h temperature: 121.93998828032942 degrees
reading id: 5 loc: North East windspeed: 68.33301646747061 km/h temperature: 72.43961890607522 degrees
reading id: 20 loc: South West windspeed: 68.40190428506615 km/h temperature: 50.051002663229866 degrees
reading id: 22 loc: North West windspeed: 70.39949039811569 km/h temperature: 103.35207406891953 degrees
reading id: 15 loc: North East windspeed: 71.17996173220197 km/h temperature: 51.47676813687897 degrees
reading id: 47 loc: North West windspeed: 71.8220975364975 km/h temperature: 91.9929481388094 degrees
reading id: 44 loc: North West windspeed: 75.38775396870949 km/h temperature: 80.35937940641892 degrees
reading id: 43 loc: North West windspeed: 75.89462865756231 km/h temperature: 69.64533123413585 degrees
reading id: 3 loc: South West windspeed: 76.71412693320178 km/h temperature: 67.21228955427254 degrees
reading id: 37 loc: South West windspeed: 81.32685659846744 km/h temperature: 122.30706927741149 degrees
reading id: 32 loc: North East windspeed: 87.61534361851872 km/h temperature: 95.37435802651964 degrees
reading id: 6 loc: North East windspeed: 92.38458270044308 km/h temperature: 133.4926466514426 degrees
reading id: 21 loc: North East windspeed: 98.99375855324114 km/h temperature: 72.13423173968312 degrees
reading id: 11 loc: South West windspeed: 101.00402357269408 km/h temperature: 74.1548182573356 degrees
reading id: 29 loc: North West windspeed: 103.19508664840207 km/h temperature: 58.79001701592672 degrees
reading id: 9 loc: South West windspeed: 107.39920092463436 km/h temperature: 83.0567800195424 degrees
reading id: 10 loc: North West windspeed: 119.09887266271122 km/h temperature: 103.10803651455117 degrees
reading id: 19 loc: North West windspeed: 121.4768639301689 km/h temperature: 131.35787666768226 degrees
reading id: 2 loc: South West windspeed: 124.42681980239756 km/h temperature: 113.148439003444 degrees
reading id: 30 loc: South West windspeed: 126.22874098620285 km/h temperature: 110.8072843402232 degrees
reading id: 23 loc: North East windspeed: 126.91777574917764 km/h temperature: 116.02450384173761 degrees
reading id: 38 loc: South West windspeed: 133.76064300830495 km/h temperature: 59.70816840513796 degrees
reading id: 33 loc: South West windspeed: 135.02472814534033 km/h temperature: 69.84661356169251 degrees
reading id: 45 loc: North East windspeed: 136.92329858093206 km/h temperature: 125.54575000348669 degrees
reading id: 39 loc: North West windspeed: 138.43809112613516 km/h temperature: 59.47439926914534 degrees
reading id: 8 loc: North West windspeed: 138.67963138115405 km/h temperature: 90.34467044848158 degrees
reading id: 40 loc: North West windspeed: 141.81818529504483 km/h temperature: 116.5468863447715 degrees
reading id: 18 loc: North West windspeed: 144.9465824573126 km/h temperature: 114.41497487765949 degrees

Array size 500 Insertion sort 2425101 Nano second

reading id: 327 loc: South West windspeed: 1.631372766717189 km/h temperature: 54.47685985849335 degrees
reading id: 445 loc: North East windspeed: 1.6717169925715953 km/h temperature: 94.35494968567872 degrees
reading id: 293 loc: North East windspeed: 1.8808711599797345 km/h temperature: 57.03678083404949 degrees
reading id: 82 loc: North West windspeed: 2.3876211769978037 km/h temperature: 127.66102915202677 degrees
reading id: 416 loc: South West windspeed: 2.5399236648395482 km/h temperature: 69.68569695821037 degrees
reading id: 191 loc: North East windspeed: 2.5685326601051504 km/h temperature: 58.58598173286484 degrees
reading id: 412 loc: South West windspeed: 2.9673801478226407 km/h temperature: 131.32025046412076 degrees
reading id: 278 loc: North East windspeed: 3.1280553970444713 km/h temperature: 127.97018298926017 degrees
reading id: 235 loc: North East windspeed: 3.3097166382139163 km/h temperature: 64.64305728462564 degrees
reading id: 175 loc: North East windspeed: 3.323326190477278 km/h temperature: 109.94983321034405 degrees
reading id: 85 loc: North West windspeed: 3.5735457567571975 km/h temperature: 91.21388444626903 degrees
reading id: 18 loc: North West windspeed: 3.744485600508021 km/h temperature: 125.72214179769313 degrees
reading id: 184 loc: North East windspeed: 4.058915687089528 km/h temperature: 62.85387073044791 degrees
reading id: 331 loc: North East windspeed: 4.843623879842799 km/h temperature: 71.00457786323966 degrees
reading id: 198 loc: North West windspeed: 5.0058088647763785 km/h temperature: 65.53212183550252 degrees
reading id: 442 loc: North East windspeed: 5.4709942981410284 km/h temperature: 64.78474657354631 degrees
reading id: 188 loc: North West windspeed: 5.645338370547099 km/h temperature: 77.94788836135339 degrees
reading id: 23 loc: North East windspeed: 5.659157116070616 km/h temperature: 126.09012107318419 degrees
reading id: 378 loc: North East windspeed: 5.683208907923757 km/h temperature: 140.9682212995591 degrees
reading id: 147 loc: North East windspeed: 5.854170444921922 km/h temperature: 54.04658742423243 degrees
reading id: 32 loc: North East windspeed: 6.112921078354839 km/h temperature: 56.164628421820346 degrees
reading id: 381 loc: North East windspeed: 6.158318039114504 km/h temperature: 111.90155324385418 degrees
reading id: 326 loc: North East windspeed: 6.531522340247799 km/h temperature: 137.83212516998432 degrees
reading id: 90 loc: South West windspeed: 6.621308352283765 km/h temperature: 79.4010594288554 degrees
reading id: 219 loc: North East windspeed: 7.01792084795069 km/h temperature: 80.64665666901338 degrees
reading id: 80 loc: North West windspeed: 7.200881406903574 km/h temperature: 76.98899244749614 degrees
reading id: 10 loc: South West windspeed: 7.505264483426029 km/h temperature: 52.424582345176624 degrees
reading id: 140 loc: North West windspeed: 7.557883094719918 km/h temperature: 139.72952544830179 degrees
reading id: 276 loc: North East windspeed: 7.757696920857228 km/h temperature: 130.80292279839855 degrees
reading id: 456 loc: North East windspeed: 7.962659356339826 km/h temperature: 80.88407273841943 degrees
reading id: 179 loc: South West windspeed: 8.667549360175327 km/h temperature: 129.89808956660454 degrees
reading id: 170 loc: North West windspeed: 9.580602162823457 km/h temperature: 71.29566187620172 degrees
reading id: 499 loc: North East windspeed: 9.692769420091963 km/h temperature: 109.67317724379319 degrees
reading id: 351 loc: South West windspeed: 9.779486304360267 km/h temperature: 96.71624856374044 degrees
reading id: 215 loc: North East windspeed: 9.815728439787838 km/h temperature: 70.28931029396574 degrees
reading id: 321 loc: North East windspeed: 9.93163381792835 km/h temperature: 102.57362699830631 degrees
reading id: 240 loc: North West windspeed: 10.270021185313855 km/h temperature: 125.61383464033334 degrees
reading id: 192 loc: South West windspeed: 10.311327464206796 km/h temperature: 115.0492094521333 degrees
reading id: 405 loc: South West windspeed: 10.612147607662802 km/h temperature: 56.22184090904828 degrees
reading id: 486 loc: North East windspeed: 11.143116999015241 km/h temperature: 122.34975518790209 degrees
reading id: 167 loc: North East windspeed: 12.105580758352312 km/h temperature: 99.49347870123346 degrees
reading id: 479 loc: South West windspeed: 12.254761078106279 km/h temperature: 109.35099587440887 degrees
reading id: 41 loc: North East windspeed: 12.561878223817319 km/h temperature: 115.26613256252287 degrees
reading id: 103 loc: North East windspeed: 12.56684915830775 km/h temperature: 89.02936736123638 degrees
reading id: 243 loc: North East windspeed: 13.622194281953714 km/h temperature: 78.17049593310298 degrees
reading id: 367 loc: North East windspeed: 14.013381644033668 km/h temperature: 111.65911390386114 degrees
reading id: 397 loc: North East windspeed: 14.523603428717351 km/h temperature: 135.55785007444746 degrees
reading id: 114 loc: South West windspeed: 14.595651471601352 km/h temperature: 60.017836398287415 degrees
reading id: 115 loc: South West windspeed: 14.801001493545325 km/h temperature: 114.85588727210232 degrees
reading id: 138 loc: North East windspeed: 14.866766148747402 km/h temperature: 88.69228739499658 degrees

Array size 500 Merge sort 829501 Nano second (only 50 copied here)

reading id: 426 loc: North East windspeed: 0.7268286085795259 km/h temperature: 90.76610367147865 degrees
reading id: 259 loc: North West windspeed: 0.8581461496960878 km/h temperature: 104.77982688888164 degrees
reading id: 227 loc: South West windspeed: 0.9744547594303596 km/h temperature: 70.39360516371718 degrees
reading id: 267 loc: North East windspeed: 1.4539053574012488 km/h temperature: 91.63072386695578 degrees
reading id: 498 loc: South West windspeed: 1.5238651845866529 km/h temperature: 101.67015193609558 degrees
reading id: 247 loc: South West windspeed: 1.7999302677892393 km/h temperature: 136.65629795442416 degrees
reading id: 69 loc: North East windspeed: 2.5930398355092272 km/h temperature: 73.80740024288824 degrees
reading id: 269 loc: North East windspeed: 2.6408902551094195 km/h temperature: 100.5023091778473 degrees
reading id: 185 loc: North West windspeed: 2.8704562474915556 km/h temperature: 54.77321860554368 degrees
reading id: 198 loc: North West windspeed: 3.1764957540912873 km/h temperature: 127.85526216219709 degrees
reading id: 168 loc: South West windspeed: 4.372470706135403 km/h temperature: 118.94609882215182 degrees
reading id: 7 loc: North East windspeed: 4.507467901977131 km/h temperature: 96.6410054615599 degrees
reading id: 177 loc: North West windspeed: 4.658125328787276 km/h temperature: 134.57447982995035 degrees
reading id: 50 loc: North East windspeed: 4.8861318643384095 km/h temperature: 117.69199738516248 degrees
reading id: 214 loc: South West windspeed: 5.099952355625765 km/h temperature: 80.44368819544437 degrees
reading id: 281 loc: North West windspeed: 5.554711981925211 km/h temperature: 61.08342393476138 degrees
reading id: 325 loc: North West windspeed: 5.696592436700995 km/h temperature: 66.73517566072803 degrees
reading id: 81 loc: North East windspeed: 6.04335846822041 km/h temperature: 95.35983879127824 degrees
reading id: 191 loc: South West windspeed: 6.451441687779803 km/h temperature: 101.19939877077508 degrees
reading id: 315 loc: North West windspeed: 6.557175426323527 km/h temperature: 136.35899416268478 degrees
reading id: 240 loc: North East windspeed: 6.77832172679549 km/h temperature: 65.21035631978984 degrees
reading id: 142 loc: South West windspeed: 6.807798688768127 km/h temperature: 52.919274860642616 degrees
reading id: 68 loc: North East windspeed: 6.884922237020411 km/h temperature: 85.5390080698029 degrees
reading id: 435 loc: South West windspeed: 6.944880492593611 km/h temperature: 137.54887985997095 degrees
reading id: 364 loc: North East windspeed: 7.002821837976913 km/h temperature: 113.54312167623947 degrees
reading id: 187 loc: South West windspeed: 7.564310136628451 km/h temperature: 62.76744096927541 degrees
reading id: 21 loc: North West windspeed: 7.627553914116763 km/h temperature: 56.636943612209265 degrees
reading id: 150 loc: South West windspeed: 8.208410751583873 km/h temperature: 67.34338617847281 degrees
reading id: 225 loc: North West windspeed: 8.40375735679418 km/h temperature: 123.69952108963746 degrees
reading id: 253 loc: South West windspeed: 8.455045015016367 km/h temperature: 132.2353866799798 degrees
reading id: 252 loc: North West windspeed: 8.700471947908856 km/h temperature: 58.848126344832124 degrees
reading id: 34 loc: North East windspeed: 8.735517987535166 km/h temperature: 114.77164221423129 degrees
reading id: 386 loc: North West windspeed: 8.902433475125138 km/h temperature: 104.59179700581939 degrees
reading id: 89 loc: North East windspeed: 9.307840972693175 km/h temperature: 100.1571189865759 degrees
reading id: 442 loc: South West windspeed: 9.675136354021767 km/h temperature: 96.15098349390189 degrees
reading id: 14 loc: North East windspeed: 10.100279560249396 km/h temperature: 51.49960026328483 degrees
reading id: 469 loc: North West windspeed: 10.16717285086004 km/h temperature: 66.08182532257213 degrees
reading id: 451 loc: North East windspeed: 10.314873566359498 km/h temperature: 125.658962996396 degrees
reading id: 249 loc: North East windspeed: 10.749756027795124 km/h temperature: 130.47401822007708 degrees
reading id: 164 loc: North West windspeed: 11.215875784823474 km/h temperature: 122.8860949830095 degrees
reading id: 213 loc: North East windspeed: 11.380859531490161 km/h temperature: 84.20210241202685 degrees
reading id: 367 loc: North East windspeed: 11.537853402205071 km/h temperature: 123.77814389516853 degrees
reading id: 342 loc: North West windspeed: 11.758391765538093 km/h temperature: 115.36459009452304 degrees
reading id: 169 loc: South West windspeed: 11.878080168582441 km/h temperature: 114.81311836611945 degrees
reading id: 338 loc: South West windspeed: 12.308116915943936 km/h temperature: 86.36203284121541 degrees
reading id: 33 loc: North East windspeed: 12.436453236721709 km/h temperature: 135.12875740386733 degrees
reading id: 365 loc: North East windspeed: 12.910494324950719 km/h temperature: 130.38845100959122 degrees
reading id: 333 loc: North West windspeed: 13.267947884579195 km/h temperature: 81.13385103077668 degrees
reading id: 18 loc: North West windspeed: 13.899494534817014 km/h temperature: 80.62114114707346 degrees
reading id: 245 loc: South West windspeed: 13.914414161555436 km/h temperature: 93.20734260877042 degrees

Conclusion:

The results for insertion sort in this case executes faster on a small sized array than merge sort because of fewer overheads. As provided summary here:

Array size 50, merge sort (1)173200 (2)169700 Insertion sort, (1)119199 (2)108100

But for bigger sized array, merge sort performs better than insertion sort due to overheads can speed up the process of sorting. As provided execute summary here.

Array size 500, merge sort, (1) 829501 (2)621400 Insertion sort, (1)2425101 (2)1976500