Microsoft Windows [Version 10.0.19043.1237]

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C:\AJINKYA\MS\US docs\UNCC All docs\Courses\fall2021\ITCS6114-DSA\Project1>python sorting\_algorithm.py

python: can't open file 'C:\AJINKYA\MS\US docs\UNCC All docs\Courses\fall2021\ITCS6114-DSA\Project1\sorting\_algorithm.py': [Errno 2] No such file or directory

C:\AJINKYA\MS\US docs\UNCC All docs\Courses\fall2021\ITCS6114-DSA\Project1>python sorting\_algorithm\_main.py

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1 - Insertion Sort

2 - Merge Sort

3 - Heap Sort

4 - In-place quicksort

5 - Modified Quicksort

6 - Run all algorithms

7 - Exit

Please select the sorting algorithm to run: 2

-------------------------Merge Sort Excution Times-------------------------

Excution time corresponds to the input sizes: [10, 1000, 2000, 3000, 5000, 10000, 20000, 30000, 40000, 50000, 60000]

Average Case Exceution Time for 3 repetitions

[0.0, 3.3341248830159507, 6.328503290812175, 9.641011555989584, 17.287413279215496, 37.89790471394857, 80.44083913167317, 125.35262107849121, 172.21625645955405, 218.75707308451334, 266.6325569152832]

Excution time for already sorted inputs

[0.0, 1.9938945770263672, 5.980014801025391, 8.975744247436523, 15.965461730957031, 34.871578216552734, 70.83702087402344, 111.70029640197754, 151.594877243042, 199.46956634521484, 233.34121704101562]

Excution time for reversely sorted inputs

[0.0, 3.991842269897461, 5.9528350830078125, 8.976221084594727, 15.983104705810547, 33.94126892089844, 73.7760066986084, 115.69523811340332, 152.5588035583496, 191.4536952972412, 235.37087440490723]

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1 - Insertion Sort

2 - Merge Sort

3 - Heap Sort

4 - In-place quicksort

5 - Modified Quicksort

6 - Run all algorithms

7 - Exit

Please select the sorting algorithm to run: 3

-------------------------Heap Sort Excution Times-------------------------

Excution time corresponds to the input sizes: [10, 1000, 2000, 3000, 5000, 10000, 20000, 30000, 40000, 50000, 60000]

Average Case Exceution Time for 3 repetitions

[0.0, 4.329840342203776, 10.965426762898764, 15.61427116394043, 26.917695999145508, 59.83924865722656, 130.9832731882731, 210.75725555419922, 319.14687156677246, 364.3505573272705, 449.47536786397296]

Excution time for already sorted inputs

[0.0, 4.991292953491211, 9.976625442504883, 14.996051788330078, 25.93088150024414, 55.85169792175293, 125.66161155700684, 196.48051261901855, 270.2772617340088, 347.03755378723145, 436.83385848999023]

Excution time for reversely sorted inputs

[0.0, 6.985664367675781, 13.962268829345703, 19.9434757232666, 36.867618560791016, 84.77592468261719, 184.47542190551758, 285.27212142944336, 410.9013080596924, 508.67533683776855, 618.3547973632812]

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1 - Insertion Sort

2 - Merge Sort

3 - Heap Sort

4 - In-place quicksort

5 - Modified Quicksort

6 - Run all algorithms

7 - Exit

Please select the sorting algorithm to run: 4

-------------------------Inplace Quick Sort Excution Times-------------------------

Excution time corresponds to the input sizes: [10, 1000, 2000, 3000, 5000, 10000, 20000, 30000, 40000, 50000, 60000]

Average Case Exceution Time for 3 repetitions

[0.0, 2.669095993041992, 4.31211789449056, 6.9819291432698565, 12.64349619547526, 25.931596755981445, 57.178099950154625, 85.77124277750652, 121.01038297017415, 150.59844652811685, 183.1664244333903]

Excution time for already sorted inputs

[0.0, 1.9948482513427734, 3.9861202239990234, 4.987478256225586, 9.974241256713867, 19.91128921508789, 40.8627986907959, 66.8177604675293, 90.78788757324219, 112.69807815551758, 134.63997840881348]

Excution time for reversely sorted inputs

[0.0, 1.9974708557128906, 3.9911270141601562, 5.982637405395508, 9.975194931030273, 20.977497100830078, 44.91424560546875, 69.81706619262695, 94.75135803222656, 119.67873573303223, 144.64664459228516]

--------------------------------------------------

1 - Insertion Sort

2 - Merge Sort

3 - Heap Sort

4 - In-place quicksort

5 - Modified Quicksort

6 - Run all algorithms

7 - Exit

Please select the sorting algorithm to run: 5

-------------------------Modfied Quick Sort Excution Times-------------------------

Excution time corresponds to the input sizes: [10, 1000, 2000, 3000, 5000, 10000, 20000, 30000, 40000, 50000, 60000]

Average Case Exceution Time for 3 repetitions

[0.0, 1.9938151041666667, 4.335482915242513, 4.6558380126953125, 9.305397669474283, 18.285274505615234, 40.53632418314616, 61.51374181111654, 85.78141530354817, 108.37705930074056, 133.65610440572104]

Excution time for already sorted inputs

[0.0, 0.9965896606445312, 0.9977817535400391, 1.9936561584472656, 3.956317901611328, 8.977413177490234, 19.94609832763672, 33.904075622558594, 45.844316482543945, 60.838937759399414, 69.78106498718262]

Excution time for reversely sorted inputs

[0.0, 0.9973049163818359, 2.962827682495117, 3.9577484130859375, 5.016565322875977, 10.969400405883789, 21.97408676147461, 36.907196044921875, 46.8747615814209, 65.82164764404297, 76.8270492553711]

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1 - Insertion Sort

2 - Merge Sort

3 - Heap Sort

4 - In-place quicksort

5 - Modified Quicksort

6 - Run all algorithms

7 - Exit

Please select the sorting algorithm to run: 6

-------------------------Insertion Sort Excution Times-------------------------

Excution time corresponds to the input sizes: [10, 1000, 2000, 3000, 5000, 10000, 20000, 30000, 40000, 50000, 60000]

Average Case Exceution Time for 3 repetitions

[0.0, 30.9298038482666, 122.66008059183757, 283.5751374562581, 762.6256148020426, 3090.7350381215415, 12571.375608444214, 28176.868120829266, 53457.73466428121, 78132.90850321452, 112417.21518834431]

Excution time for already sorted inputs

[0.0, 0.9932518005371094, 0.0, 0.0, 0.9996891021728516, 1.0006427764892578, 1.9910335540771484, 5.984783172607422, 5.984067916870117, 6.981372833251953, 7.97724723815918]

Excution time for reversely sorted inputs

[0.0, 56.85138702392578, 235.37015914916992, 549.5622158050537, 1524.919033050537, 6177.4842739105225, 24693.979740142822, 57053.42197418213, 99806.2207698822, 157219.88701820374, 227505.7213306427]

-------------------------Merge Sort Excution Times-------------------------

Excution time corresponds to the input sizes: [10, 1000, 2000, 3000, 5000, 10000, 20000, 30000, 40000, 50000, 60000]

Average Case Exceution Time for 3 repetitions

[0.0, 2.9986699422200522, 5.995750427246094, 9.984413782755533, 17.952521642049152, 37.555535634358726, 79.78677749633789, 125.97489356994629, 169.87856229146323, 219.74730491638184, 266.952117284139]

Excution time for already sorted inputs

[0.0, 2.989053726196289, 5.984067916870117, 9.974002838134766, 15.960693359375, 33.940792083740234, 72.80254364013672, 110.70084571838379, 154.58941459655762, 197.43728637695312, 235.3377342224121]

Excution time for reversely sorted inputs

[0.0, 2.962350845336914, 5.984067916870117, 8.975982666015625, 15.95616340637207, 33.913612365722656, 72.80635833740234, 110.69846153259277, 153.59020233154297, 194.51451301574707, 233.41035842895508]

-------------------------Heap Sort Excution Times-------------------------

Excution time corresponds to the input sizes: [10, 1000, 2000, 3000, 5000, 10000, 20000, 30000, 40000, 50000, 60000]

Average Case Exceution Time for 3 repetitions

[0.0, 4.974365234375, 9.651581446329752, 15.282630920410156, 26.607275009155273, 60.17319361368815, 128.97666295369467, 202.8027375539144, 287.89504369099933, 363.70595296223956, 441.8187141418457]

Excution time for already sorted inputs

[0.0, 3.9894580841064453, 8.977174758911133, 13.962745666503906, 26.929616928100586, 58.83979797363281, 128.65614891052246, 206.41517639160156, 303.1928539276123, 360.03661155700684, 434.8020553588867]

Excution time for reversely sorted inputs

[0.0, 5.985021591186523, 13.958215713500977, 18.949270248413086, 36.90743446350098, 80.79075813293457, 175.53043365478516, 284.2731475830078, 391.95942878723145, 497.6797103881836, 611.3393306732178]

-------------------------Inplace Quick Sort Excution Times-------------------------

Excution time corresponds to the input sizes: [10, 1000, 2000, 3000, 5000, 10000, 20000, 30000, 40000, 50000, 60000]

Average Case Exceution Time for 3 repetitions

[0.0, 2.326806386311849, 4.97746467590332, 6.978432337443034, 12.620369593302408, 26.262442270914715, 55.83818753560384, 87.7550443013509, 120.02364794413249, 161.5565617879232, 183.5644245147705]

Excution time for already sorted inputs

[0.0, 0.9970664978027344, 4.024744033813477, 4.986286163330078, 8.975505828857422, 19.9127197265625, 44.91543769836426, 66.82062149047852, 92.75102615356445, 128.65567207336426, 140.6238079071045]

Excution time for reversely sorted inputs

[0.0, 2.021312713623047, 3.9865970611572266, 6.983757019042969, 9.973287582397461, 20.977020263671875, 44.88039016723633, 67.81673431396484, 95.75223922729492, 120.7122802734375, 150.59733390808105]

-------------------------Modfied Quick Sort Excution Times-------------------------

Excution time corresponds to the input sizes: [10, 1000, 2000, 3000, 5000, 10000, 20000, 30000, 40000, 50000, 60000]

Average Case Exceution Time for 3 repetitions

[0.0, 0.3330707550048828, 1.0111331939697266, 0.9987354278564453, 1.331011454264323, 2.3147265116373696, 4.320224126180013, 5.991538365681966, 6.64981206258138, 12.96536127726237, 14.626661936442057]

Excution time for already sorted inputs

[0.0, 0.0, 0.0, 0.0, 0.0, 0.9975433349609375, 1.0042190551757812, 2.9909610748291016, 2.991914749145508, 2.9916763305664062, 3.9908885955810547]

Excution time for reversely sorted inputs

[0.0, 0.0, 0.0, 1.0004043579101562, 0.0, 1.0235309600830078, 1.9915103912353516, 3.000020980834961, 2.9921531677246094, 4.0225982666015625, 3.9894580841064453]

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1 - Insertion Sort

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6 - Run all algorithms

7 - Exit

Please select the sorting algorithm to run: 7

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