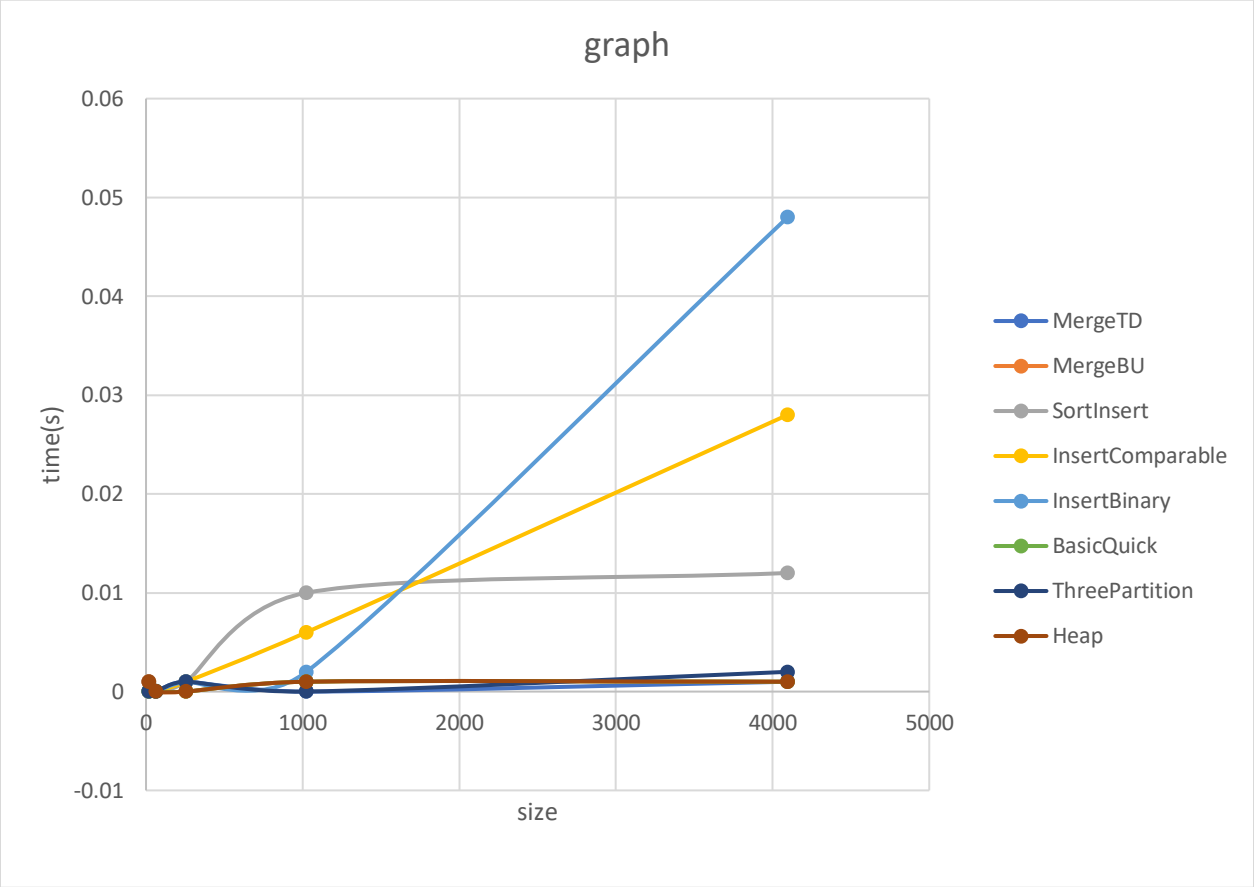
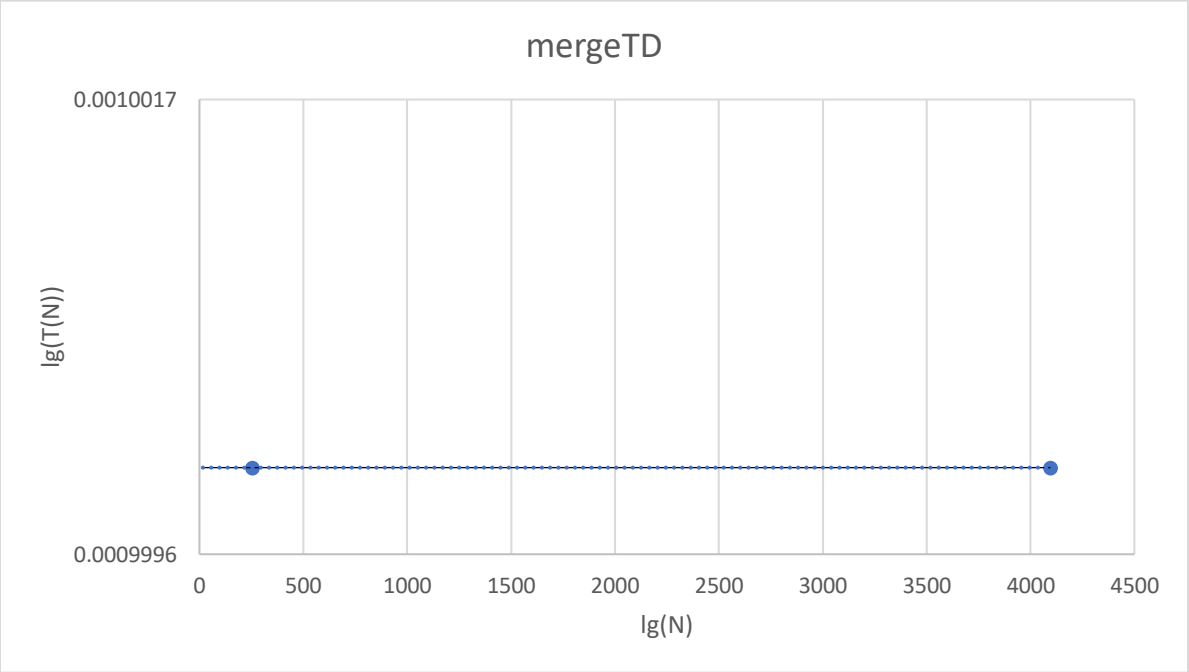
	Execution time(s)	Size of the dataset(elements)
MergeTD	0.0	2^4
	0.0	2^6
	0.001	2^8
	0.0	2^10
	0.001	2^12
MergeBU	0.001	2^4
	0.0	2^6
	0.0	2^8
	0.001	2^10
	0.001	2^12
SortInsert	0.001	2^4
	0.0	2^6
	0.001	2^8
	0.01	2^10
	0.012	2^12
InsertComparable	0.0	2^4
	0.0	2^6
	0.001	2^8
	0.006	2^10
	0.028	2^12
InsertBinary	0.0	2^4
	0.0	2^6
	0.001	2^8
	0.002	2^10
	0.048	2^12
BasicQuick	0.0	2^4
	0.0	2^6
	0.0	2^8
	0.001	2^10
	0.001	2^12
ThreePartition	0.0	2^4
	0.0	2^6
	0.001	2^8
	0.0	2^10
	0.002	2^12
Heap	0.001	2^4
	0.0	2^6
	0.0	2^8

	0.001	2^10
	0.001	2^12



Log log graphs →following the textbook and 2C03 lectures



Lg(T(N)) = b lg N + lg a

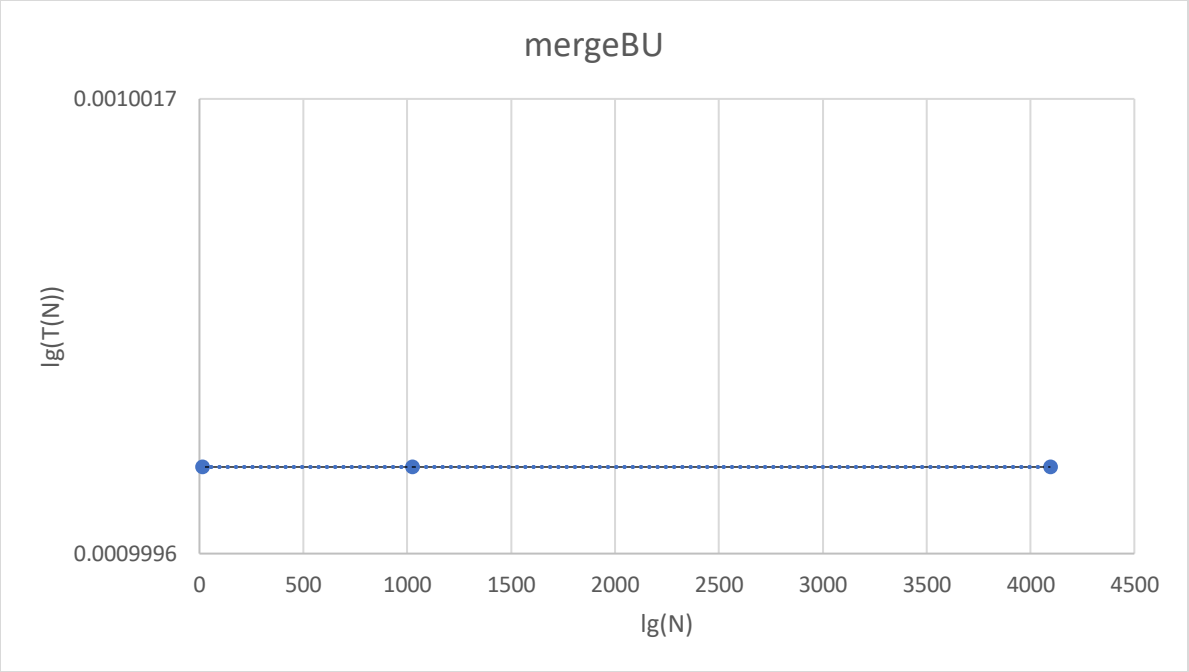
b = $\frac{\lg(0.001)-\lg(0.001)}{\lg(4096)-\lg(256)}$ = 0 – slope

a = 0.001

T(N) = a N^b

T(N) = 0.001 × N^0 = 0.001

In big o notation → O(0.001)



Lg(T(N)) = b lg N + lg a

b = $\frac{\lg(0.001)-\lg(0.001)}{\lg(4096)-\lg(256)}$ = 0 – slope

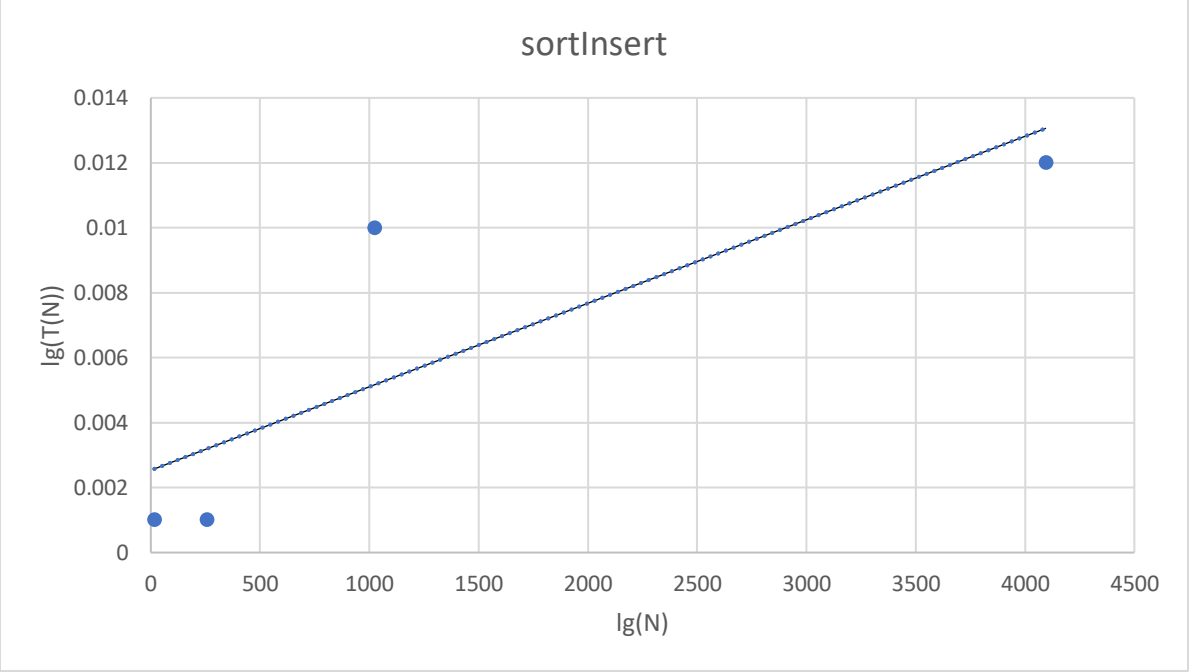
a = 0.001

T(N) = a N^b

T(N) = 0.001 × N^0 = 0.001

In big o notation → O(0.001)

Insertion sorts



Lg(T(N)) = b lg N + lg a

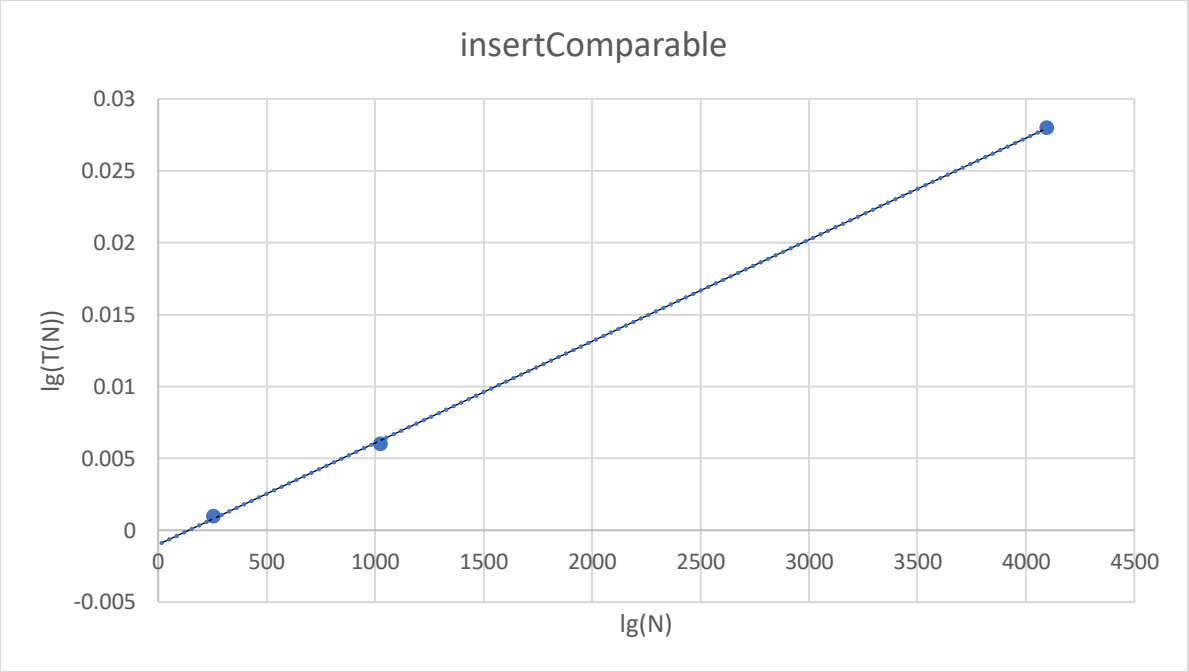
b = $\frac{\lg(0.01)-\lg(0.004)}{\lg(2900)-\lg(590)}$ = 0.575435 – slope

a = 1.0177×10^{-4}

T(N) = a N^b

T(N) = $1.0177 \times 10^{-4} \times N^{0.575435}$

In big o notation → O($N^{0.575435}$)



Lg(T(N)) = b lg N + lg a

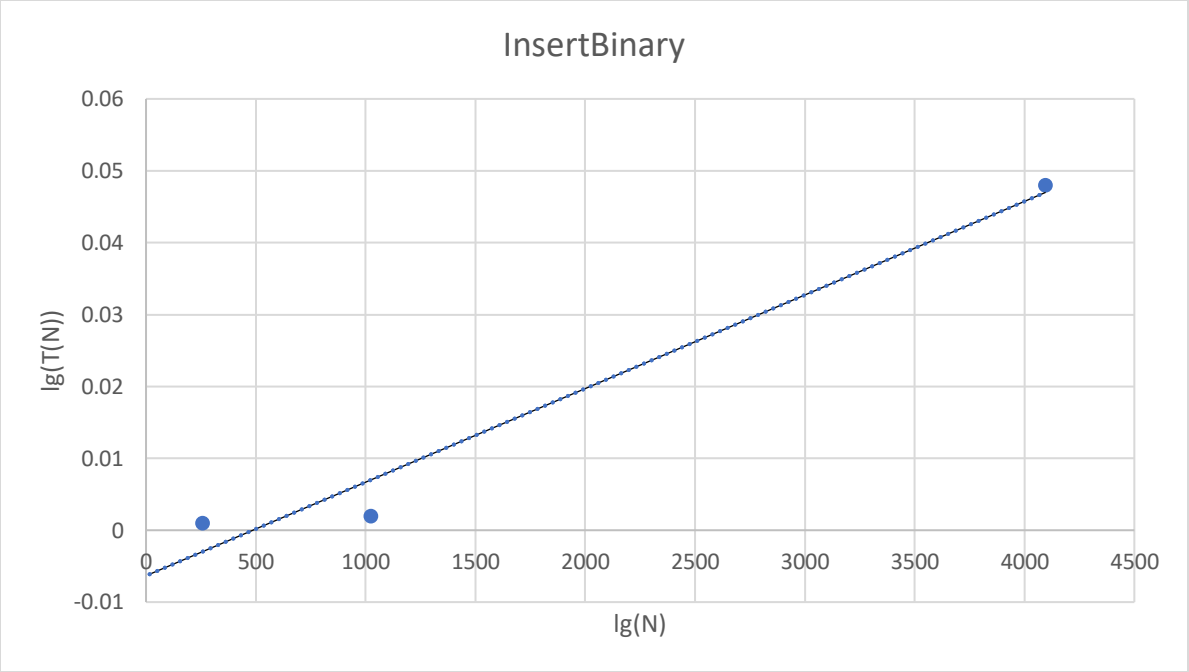
b = $\frac{\lg(0.001)-\lg(0.006)}{\lg(256)-\lg(1024)}$ = 1.29248 – slope

a = 7.716×10^{-7}

T(N) = a N^b

T(N) = $7.716 \times 10^{-7} \times N^{1.292}$

In big o notation → O($N^{1.292}$)



Lg(T(N)) = b lg N + lg a

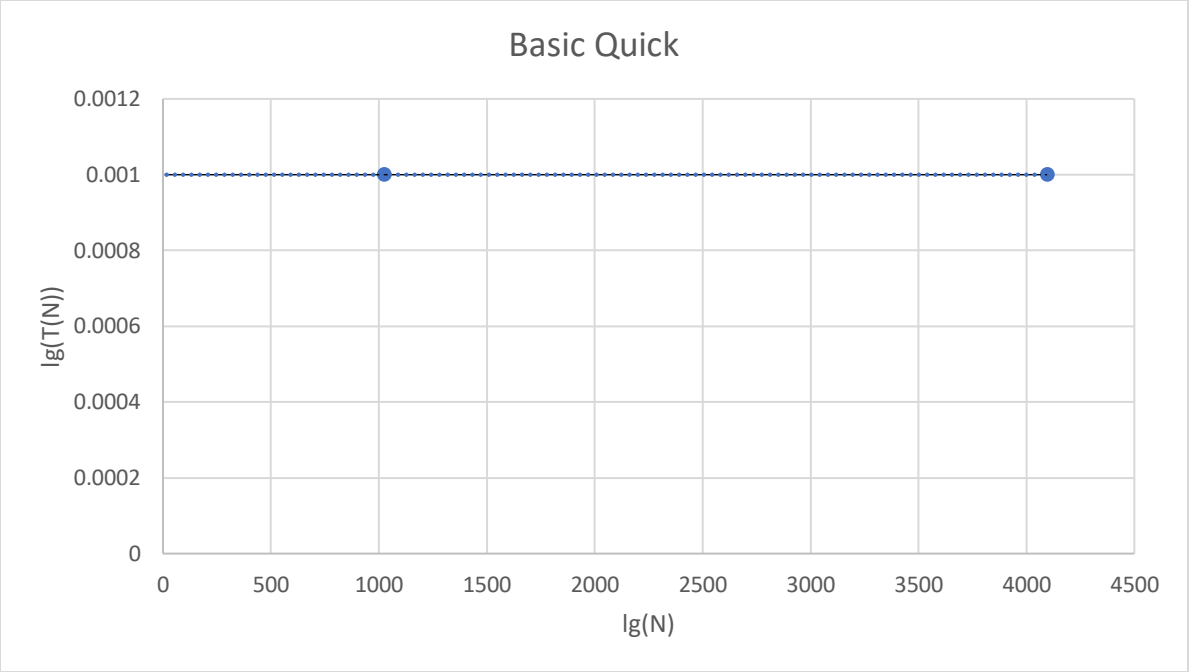
b = $\frac{\lg(0.04)-\lg(0.02)}{\lg(3510)-\lg(2000)}$ = 1.2323 – slope

a = 1.7103×10^{-6}

T(N) = a N^b

T(N) = $1.7103 \times 10^{-6} \times N^{1.2323}$

In big o notation → O($N^{1.232}$)



Lg(T(N)) = b lg N + lg a

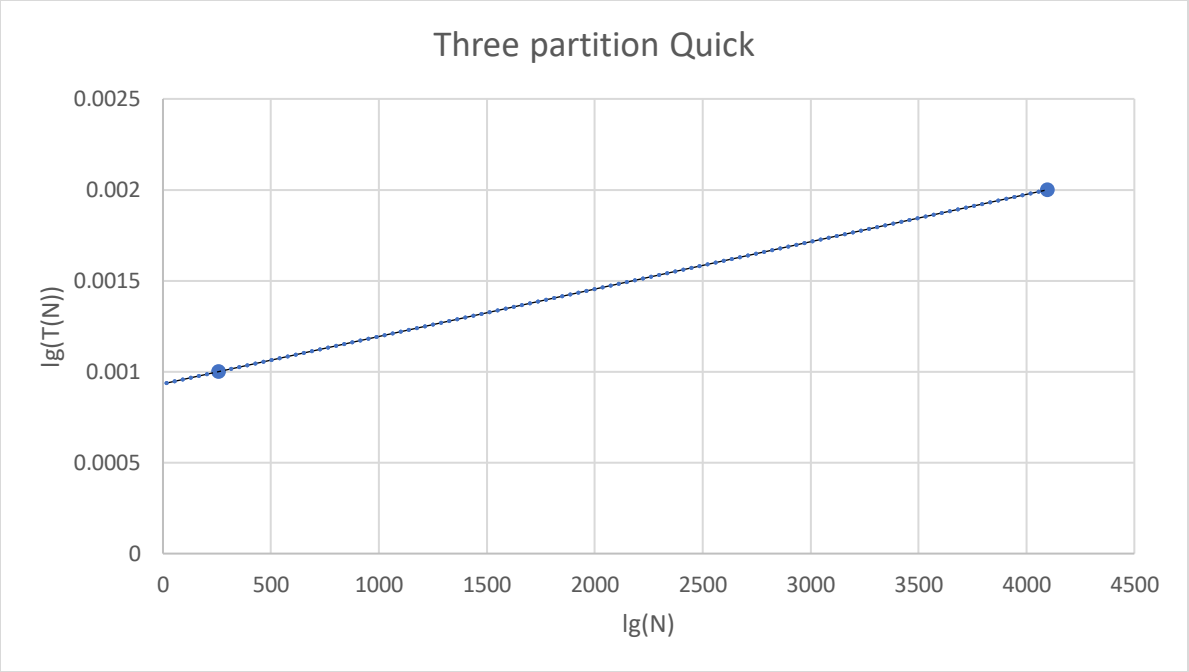
b = $\frac{\lg(0.001)-\lg(0.001)}{\lg(4096)-\lg(256)}$ = 0 – slope

a = 0.001

T(N) = a N^b

T(N) = 0.001 × N^0 = 0.001

In big o notation → O(0.001)



Lg(T(N)) = b lg N + lg a

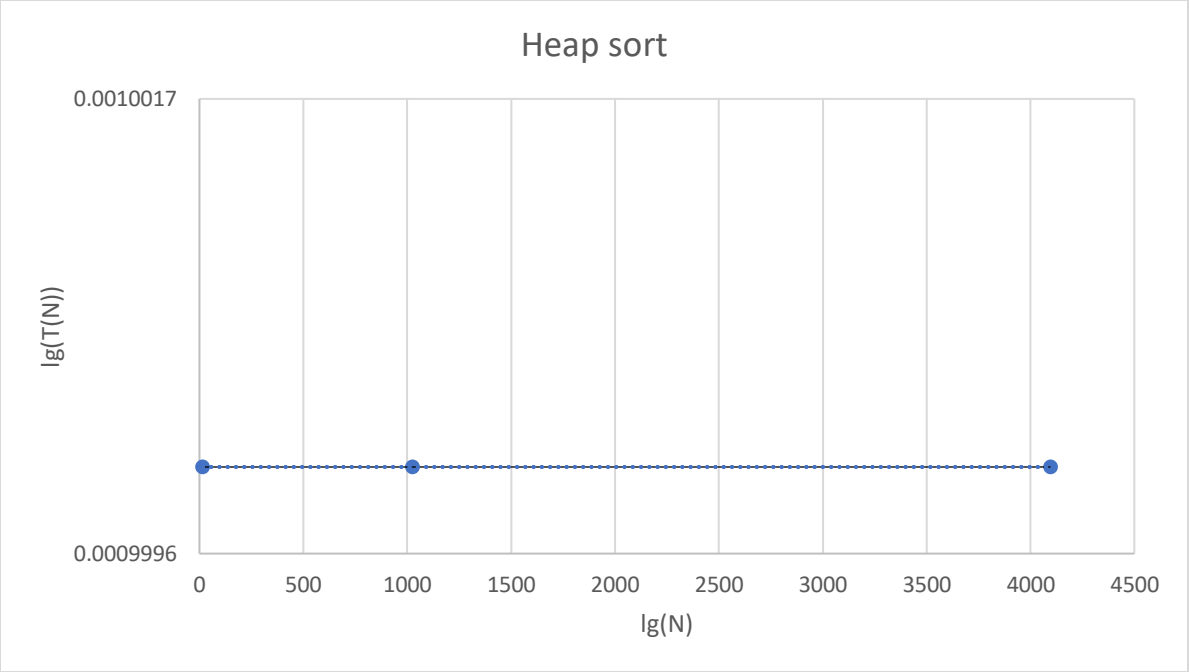
b = $\frac{\lg(0.002)-\lg(0.001)}{\lg(4096)-\lg(256)}$ = 0.25 – slope

a = 2.5×10^{-4}

T(N) = a N^b

T(N) = $2.5 \times 10^{-4} \times N^{0.25}$

In big o notation → O($N^{0.25}$)



Lg(T(N)) = b lg N + lg a

b = $\frac{\lg(0.001)-\lg(0.001)}{\lg(4096)-\lg(256)}$ = 0 – slope

a = 0.001

T(N) = a N^b

T(N) = 0.001 × N^0 = 0.001

In big o notation → O(0.001)

	Hypothesis(s)	Prediction: (s) array size: 2^{14}	Observation: (s) array size: 2^{14}	Prediction: (s) array size: 2^{16}	Observation: (s) array size: 2^{16}
mergeTD	O(0.001)	0.001	0.006	0.001	0.013
mergeBU	O(0.001)	0.001	0.003	0.001	0.006
sortInsert	O($N^{0.575}$)	0.027	0.19	0.060	0.211
insertComparable	O($N^{1.292}$)	0.215	0.682	1.289	3.799
insertBinary	O($N^{1.232}$)	0.2662	0.114	1.469	2.226
BasicQuick	O(0.001)	0.001	0.005	0.001	0.012
Threepartition Quick	O($N^{0.25}$)	0.0028	0.005	0.004	0.023
Heap sort	O(0.001)	0.001	0.014	0.001	0.017

As the assignment asks, I ordered the algorithms from best to worst in a1_out.txt.(int data folder)