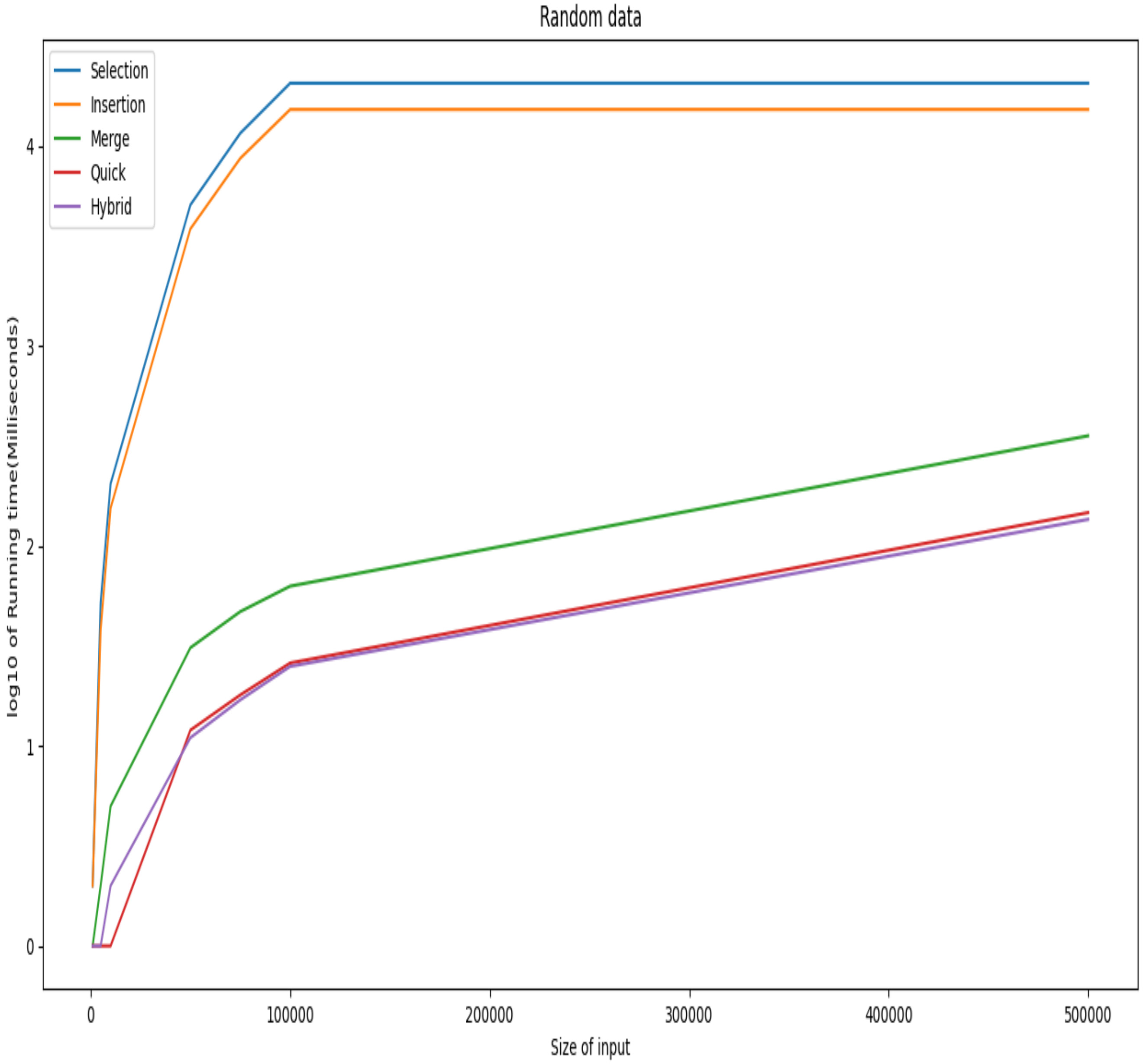
Random data

	1000	5000	10000	50000	75000	100000	500000
Selection	2	52	205	5086	11608	20650	-
Insertion	2	38	155	3859	8694	15256	-
Merge	0	2	5	31	47	63	356
Quick	0	0	1	12	20	26	147
Hybrid	0	0	2	11	17	25	136

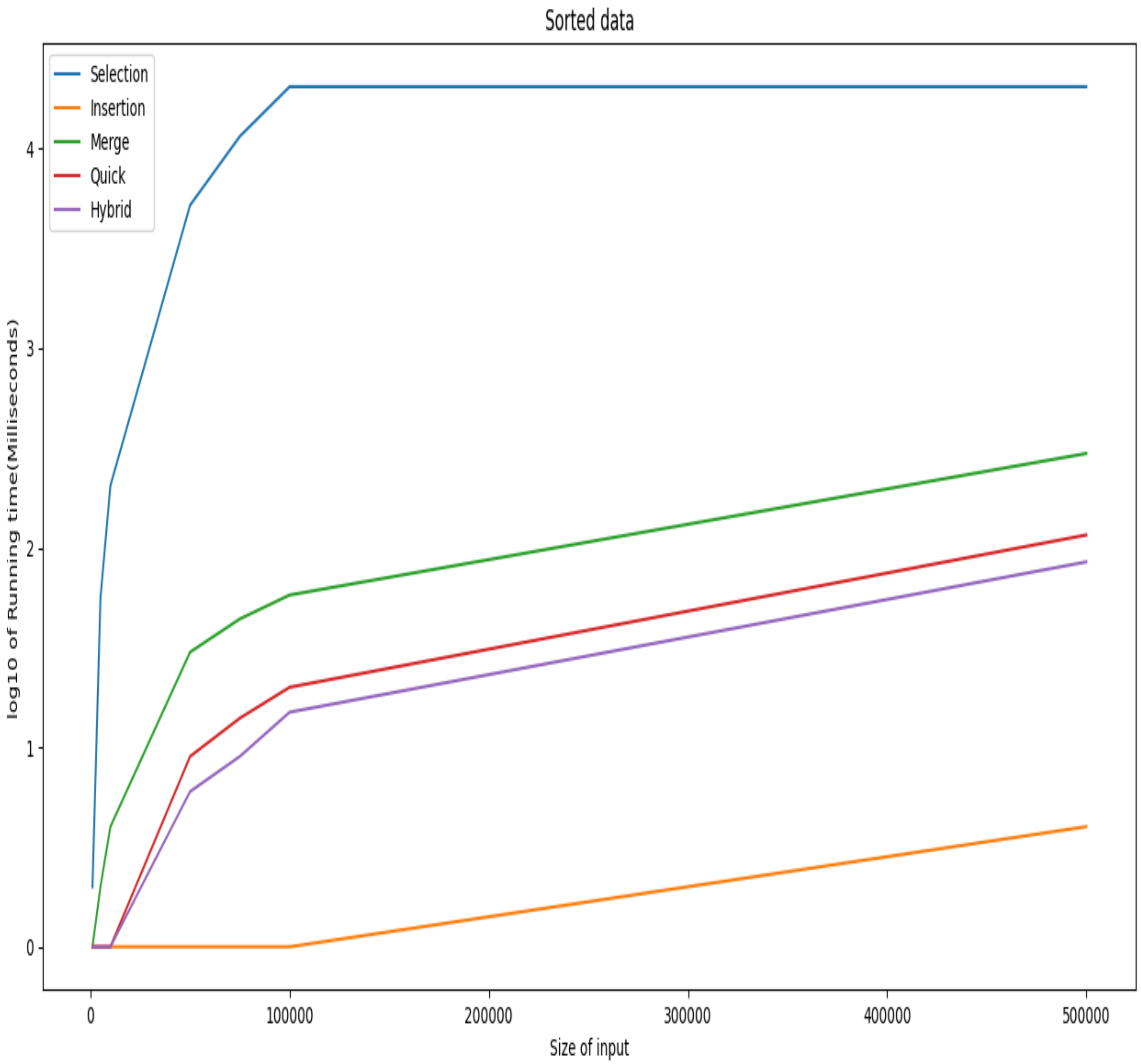
Sorted data

	1000	5000	10000	50000	75000	100000	500000
Selection	2	56	205	5215	11549	20485	-
Insertion	0	0	0	0	0	0	4
Merge	0	2	4	30	44	58	297
Quick	0	0	1	9	14	19	116
Hybrid	0	0	1	6	9	15	85

Random data graph



Sorted data graph



how is hybrid sorting algorithm created?

From the running time of all algorithms, I found that randomized quick sort is the best sorting algorithm at all values of N except for insertion sort in sorted data and some other sorting algorithms has the same running time as that of randomized quick sort at some values of N.

But zero time at some values of N doesn't give me an indicator to which of them is better at this value of N so I calculated the time in microseconds and, I found that randomized quick sort is the best also except for insertion sort in sorted data.

So, I concluded that I must use randomized quick sort at all values of N except for sorted data I have to use insertion sort.

So, I designed the hybrid algorithm as follows: -

1- Use randomized quick sort
2- When size of partition is less than or equal to 20 elements switch to insertion

This approach may give better performance if the data in the partition is sorted or almost sorted.