Lab 1: The Maximum Contiguous Subsequence Sum Problem

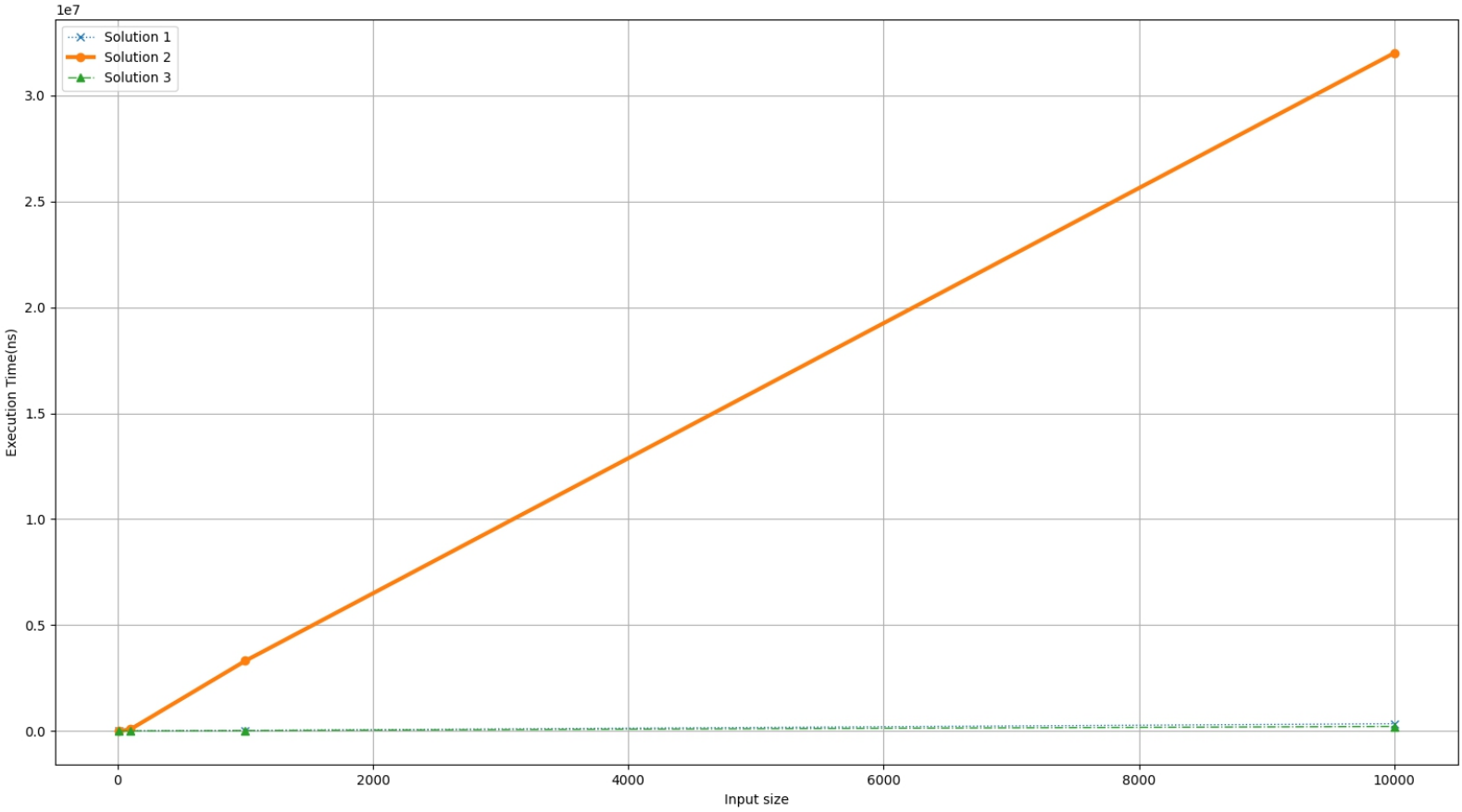
Record of the time taken by the three solutions for different input sizes.
1. INPUT SIZES : 10, 100, 1000, 10000

2. Observation

Input & Test	Solution 1	Solution 2	Solution 3
Size 10 - Input 1 - Test 1	5030 ns	2916 ns	2054 ns
Size 10 - Input 1 - Test 2	1963 ns	7193 ns	2555 ns
Size 10 - Input 1 - Test 3	2685 ns	3807 ns	2064 ns
Size 10 - Input 1 Average	***3226 ns***	***4638.6 ns***	***2224.3 ns***
Size 10 - Input 2 - Test 1	1763 ns	3196 ns	1904 ns
Size 10 - Input 2 - Test 2	1843 ns	2846 ns	2244 ns
Size 10 - Input 2 - Test 3	1793 ns	2796 ns	5040 ns
Size 10 - Input 2 - Average	***1799.6***	***2946***	***3062.6***
Size 10 - Average	**2512.8 ns**	**3792.3 ns**	**2643.45 ns**
Size 100 - Input 1 - Test 1	4148 ns	117293 ns	4068 ns
Size 100 - Input 1 - Test 2	4388 ns	80703 ns	5190 ns
Size 100 - Input 1 - Test 3	4248 ns	74631 ns	4609 ns
Size 100 - Input 1 Average	***4261.3 ns***	***90875.6 ns***	***4622.3 ns***
Size 100 - Input 2 - Test 1	4058 ns	76109 ns	4358 ns
Size 100 - Input 2 - Test 2	4118 ns	79016 ns	4398 ns
Size 100 - Input 2 - Test 3	4138 ns	83404 ns	4008 ns
Size 100 - Input 2 - Average	***4104.6 ns***	***79509.6 ns***	***4254.6 ns***
Size 100 - Average	**4182.95 ns**	**85192.6 ns**	**4438.45 ns**
Size 1000 - Input 1 - Test 1	21751 ns	2804337 ns	23815 ns
Size 1000 - Input 1 - Test 2	21792 ns	6073373 ns	23855 ns
Size 1000 - Input 1 - Test 3	23775 ns	2508809 ns	25321 ns
Size 1000 - Input 1 Average	***22439 ns***	***3795506 ns***	***24330 ns***
Size 1000 - Input 2 - Test 1	25939 ns	2780764 ns	23137 ns
Size 1000 - Input 2 - Test 2	23765 ns	3162134 ns	26243 ns
Size 1000 - Input 2 - Test 3	53802 ns	2564926 ns	22174 ns
Size 1000 - Input 2 - Average	***34502 ns***	***2835941 ns***	***23851 ns***
Size 1000 - Average	**28470.5 ns**	**3315723.5 ns**	**24090.5 ns**
Size 10000 - Input 1 - Test 1	207409 ns	42507890 ns	227939 ns
Size 10000 - Input 1 - Test 2	451187 ns	35883388 ns	214262 ns
Size 10000 - Input 1 - Test 3	497424 ns	17728229 ns	213852 ns
Size 1000 - Input 1 Average	***385340 ns***	***32039836 ns***	***218684 ns***
Size 10000 - Input 2 - Test 1	209064 ns	39758676 ns	222128 ns
Size 10000 - Input 2 - Test 2	191150 ns	38229498 ns	218231 ns
Size 10000 - Input 2 - Test 3	223401 ns	17898520 ns	214253 ns
Size 10000 - Input 2-Average	***311807.5 ns***	***31962231 ns***	***218204 ns***
Size 10000 - Average	**348574 ns**	**32001033.5 ns**	**218444 ns**

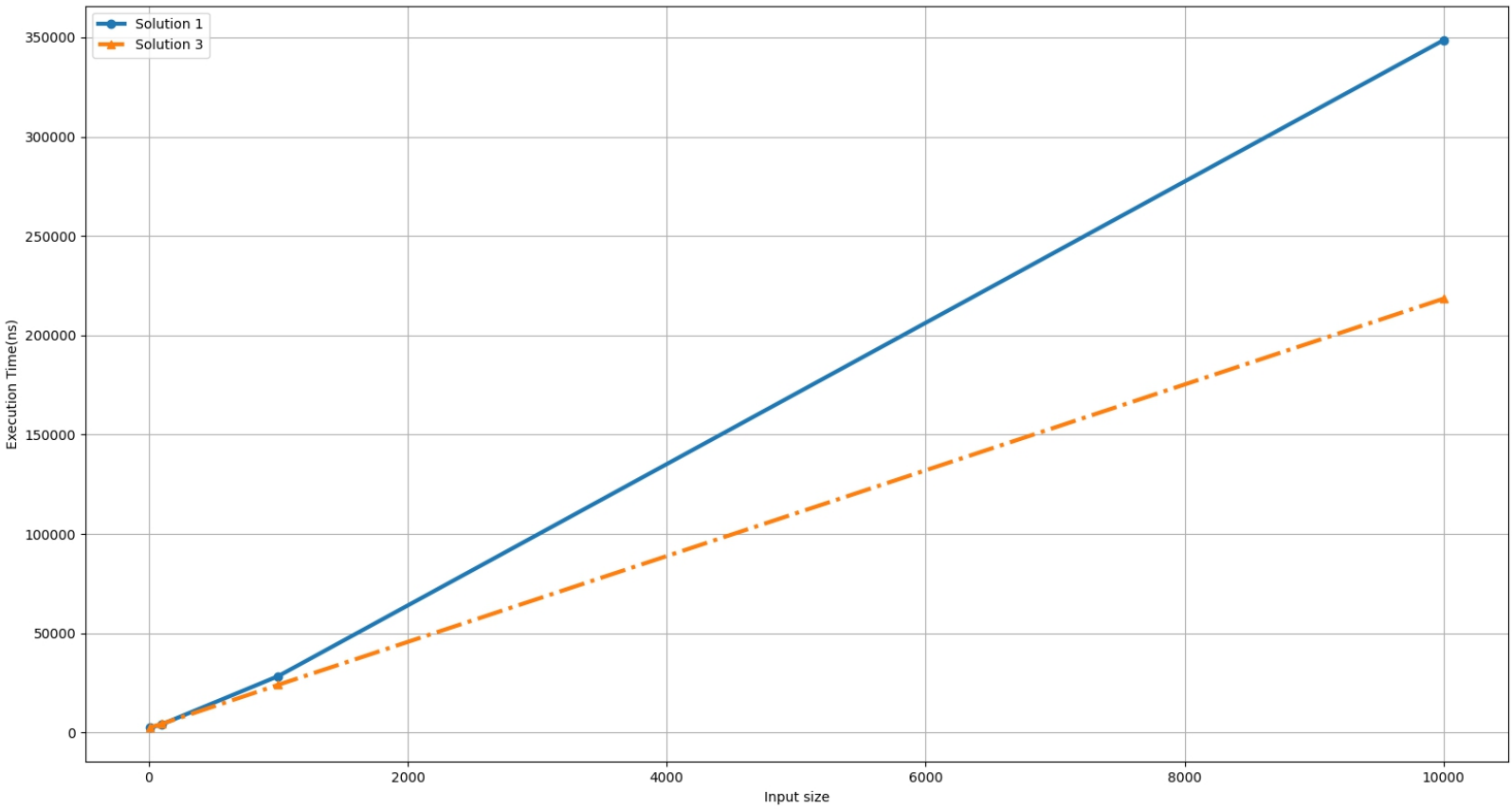
3. Graphs:

1) Graph Showing Solution 1, Solution 2 and Solution 3 together



The above graph shows all the three Solutions in a single graph. It can be seen that solution 2 is highly inefficient since the rate of increase of execution time is higher compared to Soltuion 1 and Solution 3, with increasing input size.

2) Graph showing Solution 1 and Solution 3.



It can be seen from the above graph that solution 3 is more efficient than solution 2 for large input sizes.