SUMMARY

USC ID/s: 4726453114 , 4783513883

M+N	Time in MS (Basic)	Time in MS (Efficient)	Memory in KB (Basic)	Memory in KB (Efficient)
16	0.2810955047607422	0.21767616271972656	11392	11568
64	0.6930828094482422	1.1410713195800781	11472	11632
128	1.7993450164794922	4.562139511108398	11168	11328
256	6.141901016235352	15.586137771606445	11504	11888
384	13.237953186035156	37.46986389160156	11520	11552
512	23.569345474243164	55.769920349121094	11792	11968
768	54.26192283630371	126.10292434692383	12752	11328
1024	100.11482238769531	197.6611614227295	13568	11664
1280	152.22787857055664	302.91295051574707	14704	11632
1536	215.76571464538574	425.13108253479004	16304	11648
2048	398.25892448425293	771.1632251739502	20512	11760
2560	642.1101093292236	1211.0819816589355	26160	11456
3072	909.5699787139893	1741.4650917053223	31488	11904
3584	1244.8539733886719	2462.6617431640625	38224	12016
3968	1502.21586227417	2908.9579582214355	27824	12064

Datapoints

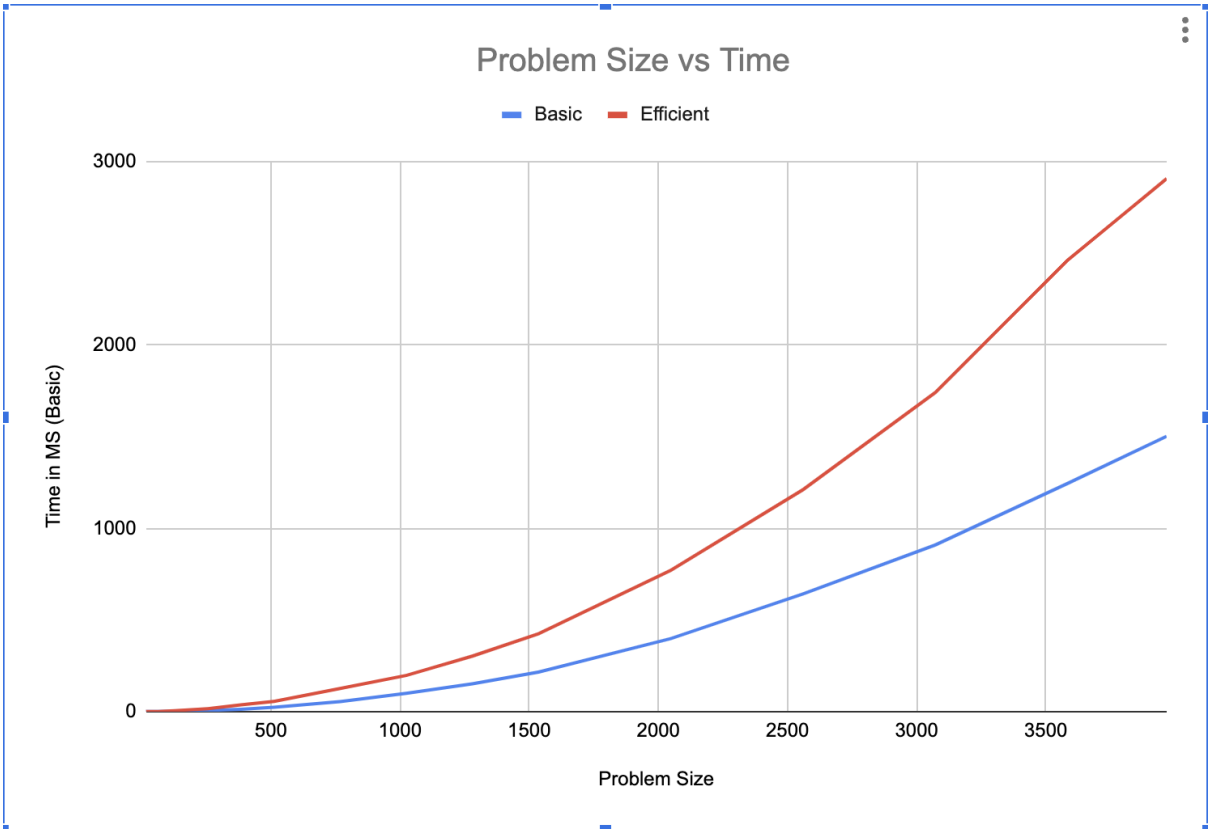
Insights

Graph1 – Memory vs Problem Size (M+N)

Nature of the Graph (Logarithmic/ Linear/ Exponential)
Basic: Linear
Efficient: Exponential

Explanation: Since we are finding a the optimal point using divide and conquer first and then implementing the dynamic programming. In case of efficient solution we only, we only need the 2 columns to find the next set of solutions Therefore the complexity mostly remains the same. Basic forms a linear graph as the problem size increases the memory size taken by the basic algo increases linearly. In case of efficient solution, the graph makes a exponential convergence and there is very less variation even when there is significant change in problem size

Graph2 – Time vs Problem Size (M+N)



Nature of the Graph (Logarithmic/ Linear/ Exponential)

Basic: Exponential

Efficient:Exponential

Explanation: Both the basic and efficient solution makes an exponential convergence. Since the efficient solution takes more number of iterations during divide and conquer hence it takes exponential amount of time as the problem size increases whereas in case of basic the number of iterations is less hence the growth is less than efficient solution

Contribution

4726453114(Apurva Gupta):Equal Contribution

4783513883(Kaustubh Rai):Equal Contribution