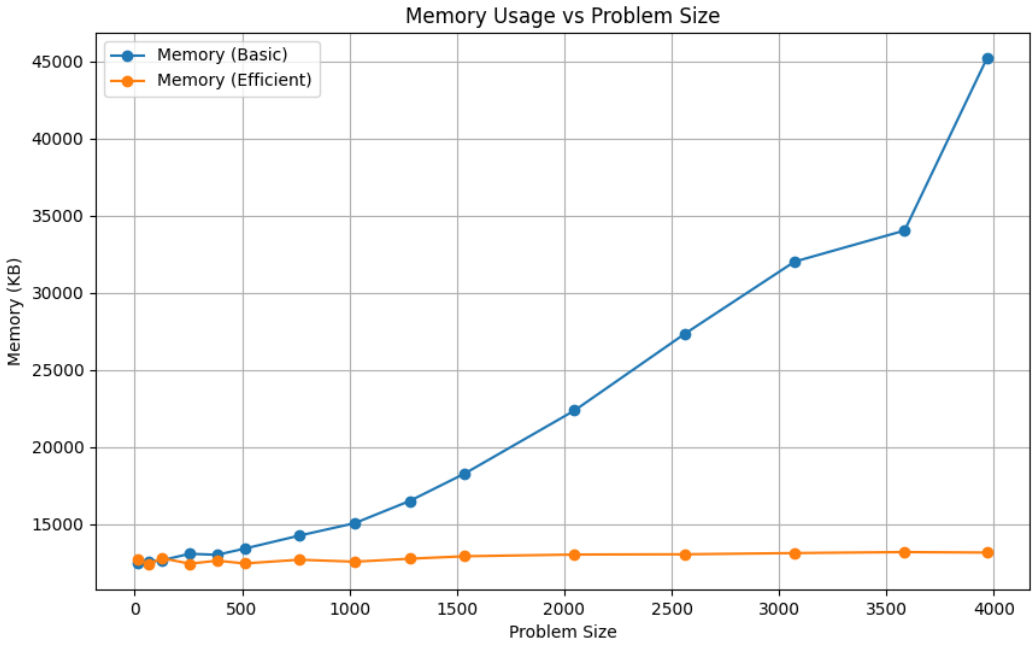
SUMMARY

USC ID/s: 8761762874, 6195368431, 6261807164

Datapoints

M+N	Time in MS (Basic)	Time in MS (Efficient)	Memory in KB (Basic)	Memory in KB (Efficient)
16	0.03409385681152344	0.11491775512695312	12464	12704
64	0.35691261291503906	0.8718967437744141	12576	12416
128	1.3871192932128906	3.021717071533203	12672	12800
256	5.263805389404297	11.33584976196289	13088	12448
384	12.230873107910156	25.12502670288086	13024	12640
512	21.031856536865234	45.53103446960449	13424	12464
768	47.73402214050293	99.822998046875	14272	12704
1024	92.78988838195801	181.49399757385254	15072	12576
1280	143.82386207580566	280.78699111938477	16512	12768
1536	204.33902740478516	409.8341464996338	18288	12928
2048	374.13597106933594	719.1519737243652	22384	13040
2560	587.4671936035156	1145.3111171722412	27344	13056
3072	855.4928302764893	1597.7370738983154	32032	13136
3584	1159.7650051116943	2219.676971435547	34048	13200
3968	1432.0168495178223	2695.0089931488037	45232	13168

Graph1 – Memory vs Problem Size (M+N)



Nature of the Graph (Logarithmic/ Linear/ Polynomial/ Exponential)

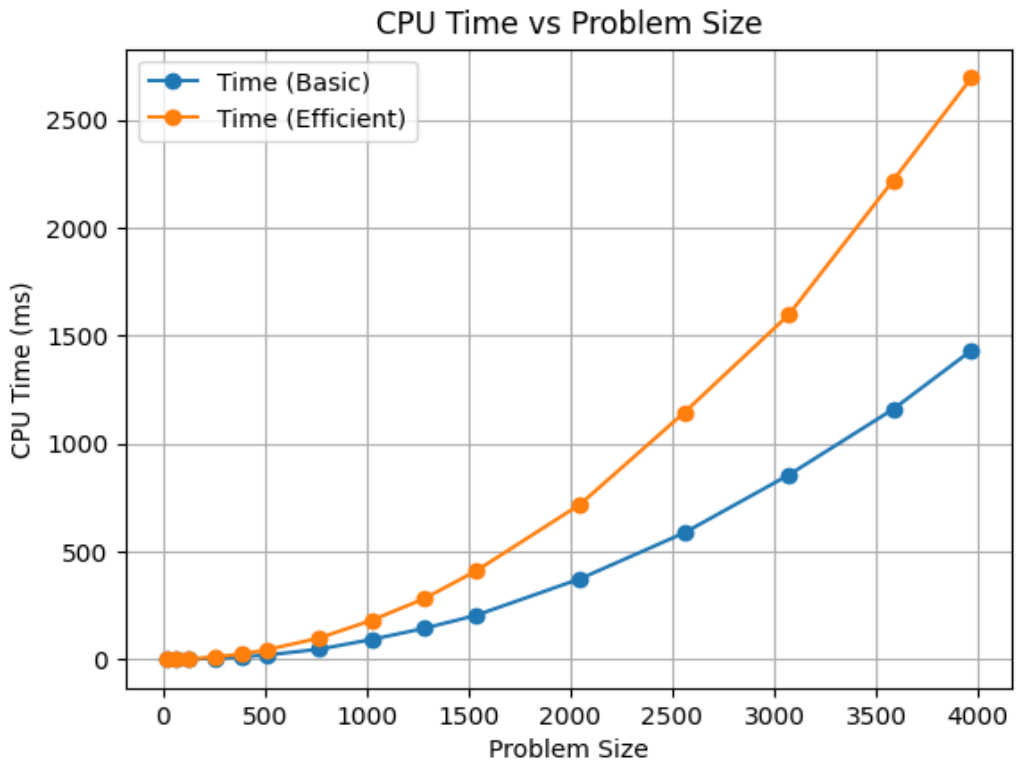
Basic: Polynomial

Efficient: Constant

Explanation:

The memory used by the basic version of the program increases in a polynomial fashion as the problem size increases. The memory used by the efficient algorithm stays constant with the increase in the problem size. So, from this graph, we can conclude that the efficient algorithm will use less memory when the problem size increases. Efficient algorithm is using space in the order of O(m+n) and basic algorithm is using the order of O(mxn)

Graph2 – Time vs Problem Size (M+N)



Nature of the Graph (Logarithmic/ Linear/ Polynomial/ Exponential)

Basic: Polynomial

Efficient: Polynomial

Explanation:

So, from the graph plotted above, we can say that the time taken by the basic algorithm as well as time taken by efficient algorithm is increasing in polynomial manner which is O(mxn) with the increase in problem size. Small problem sizes here are taking almost similar time, but with larger problem sizes the slope of efficient algorithm is more than the slope of the basic algorithm.

Contribution

6195368431 : Equal Contribution

6261807164 : Equal Contribution

8761762874 : Equal Contribution