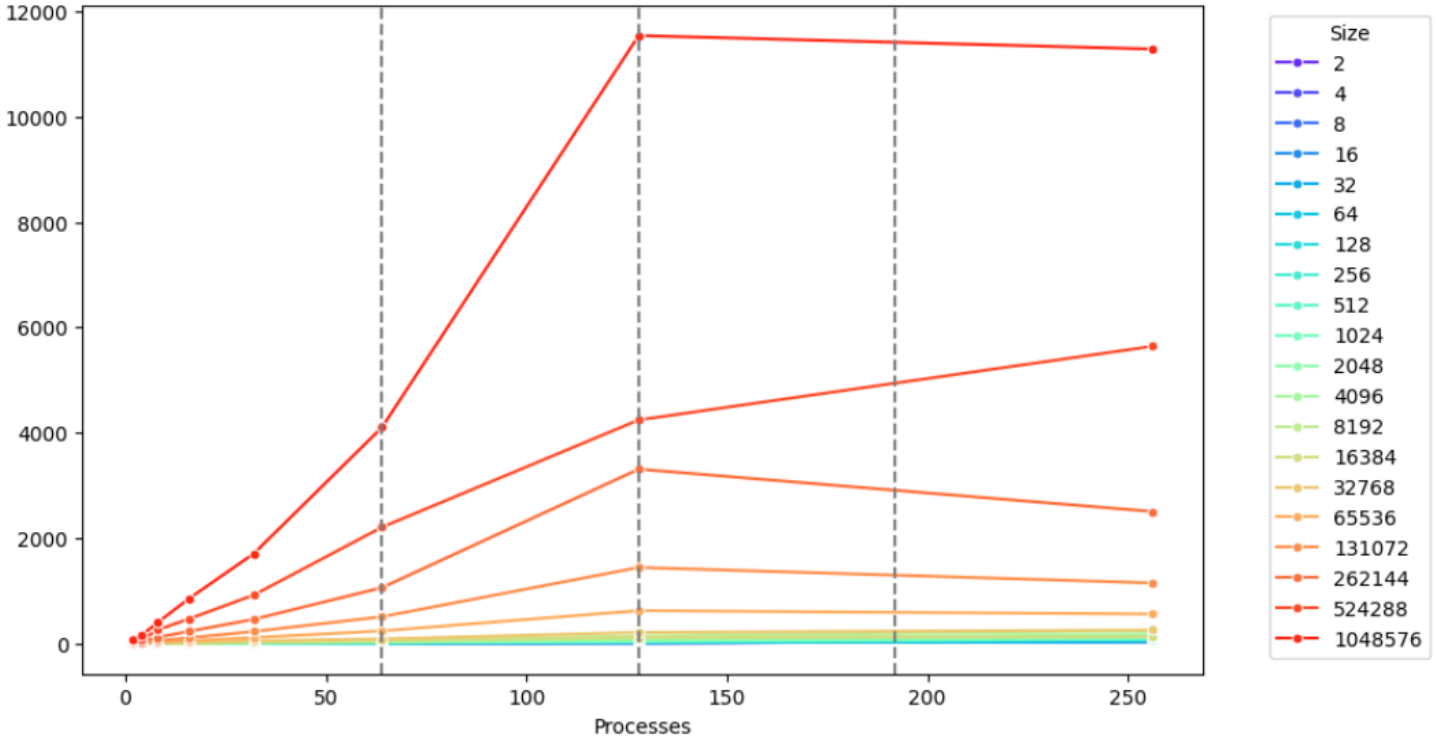
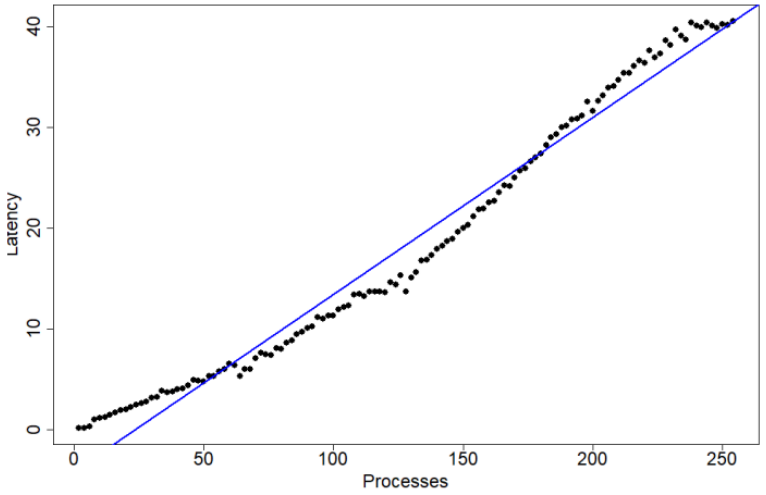
Exercise 1

THIS EXERCISE AIMS TO ESTIMATE THE LATENCY OF DIFFERENT OPENMPI IMPLEMENTATION AVAILABLE IN THE OSU BENCHMARK VARYING THE NUMBER OF PROCESSES AND THE SIZE OF THE MESSAGES.

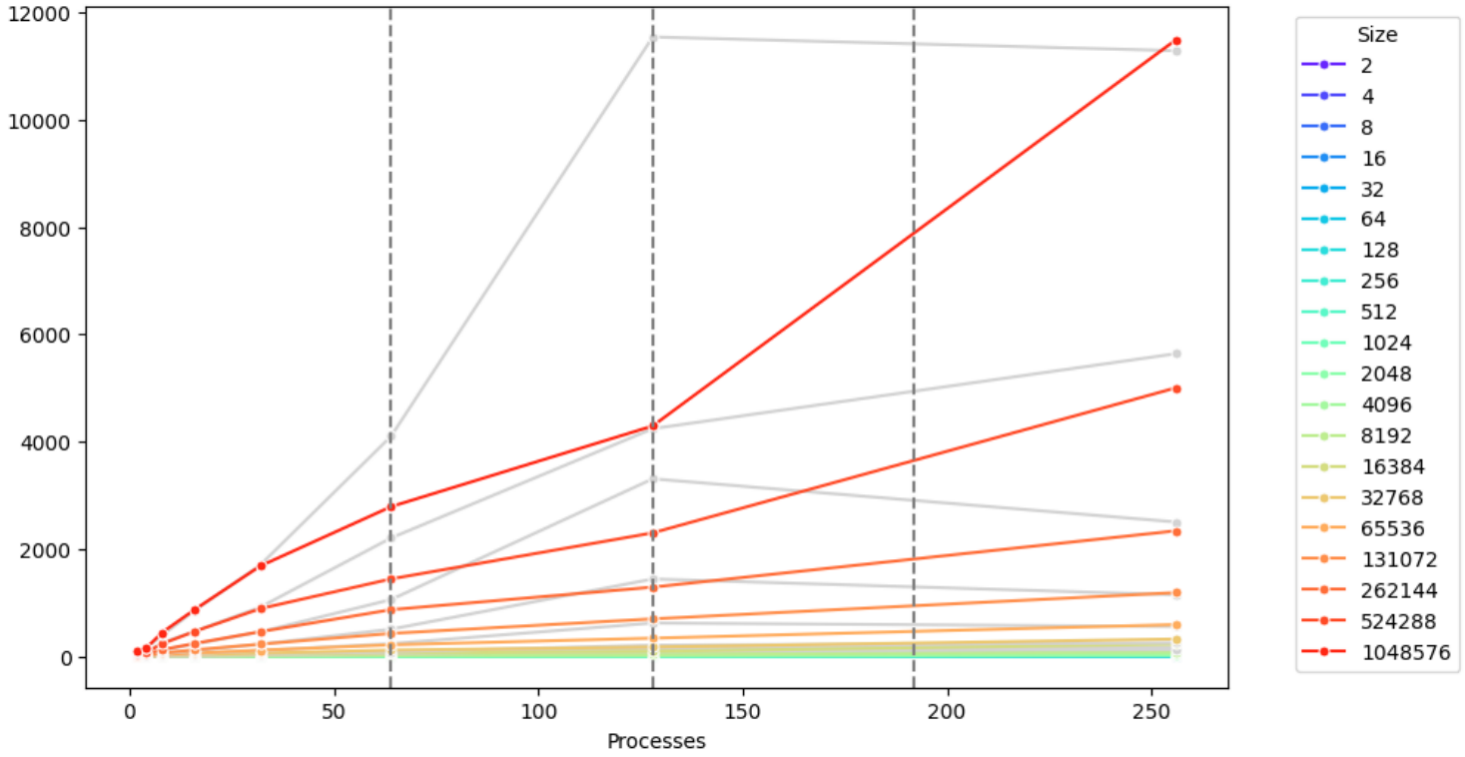
Basic Linear Broadcast

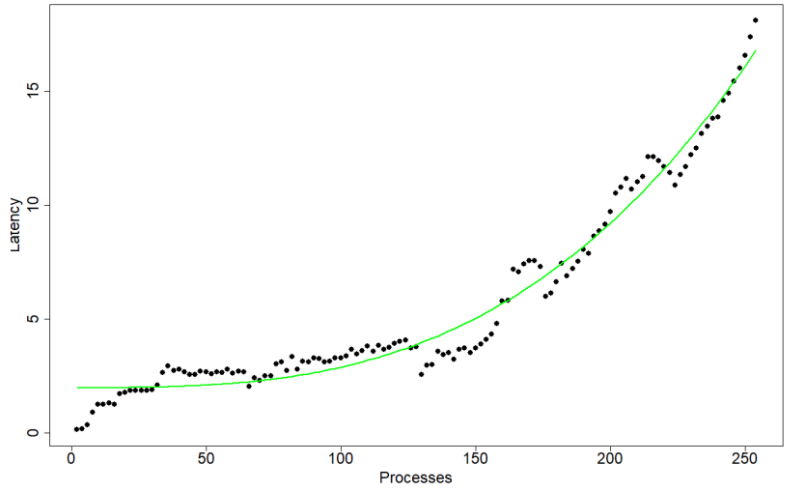




$$\text{latency} = -4.16 + 0.18\text{processes}$$

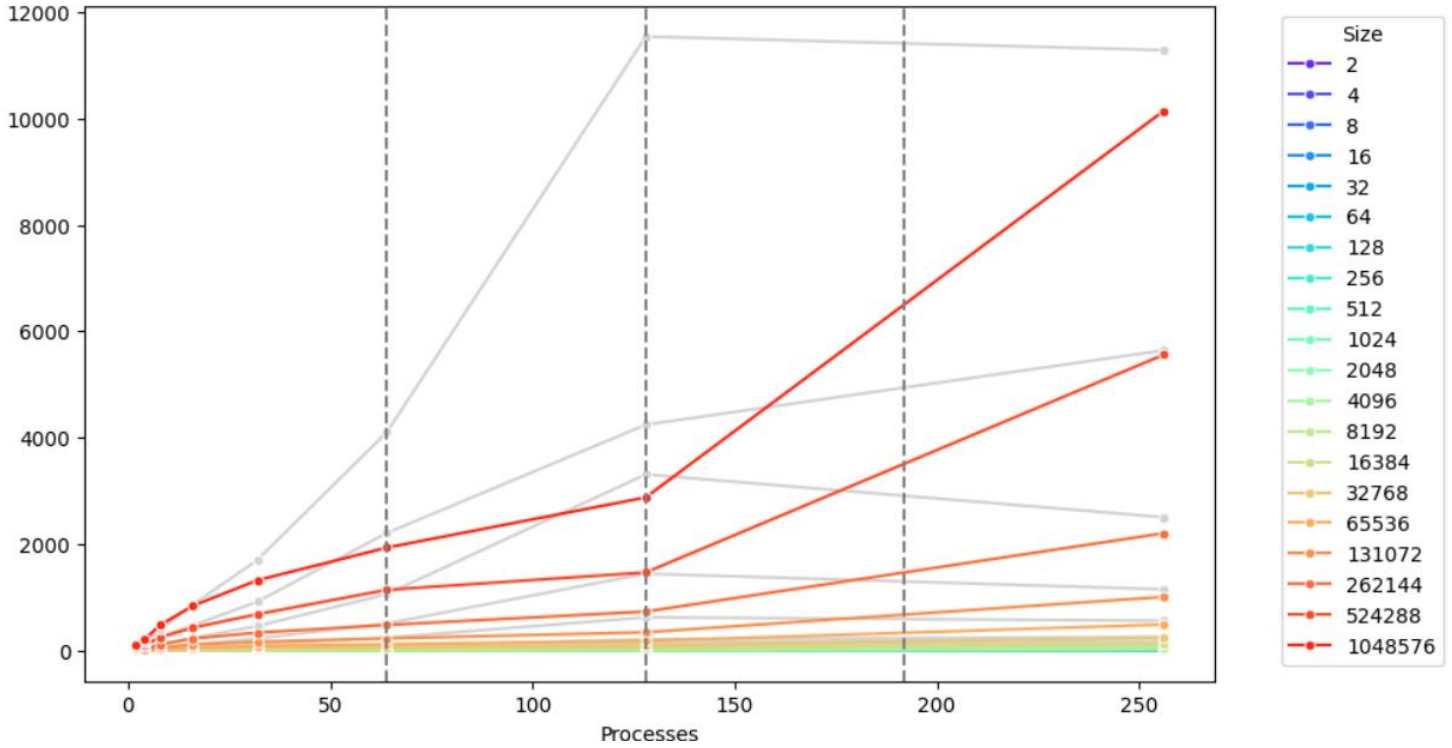
Binary Tree Broadcast

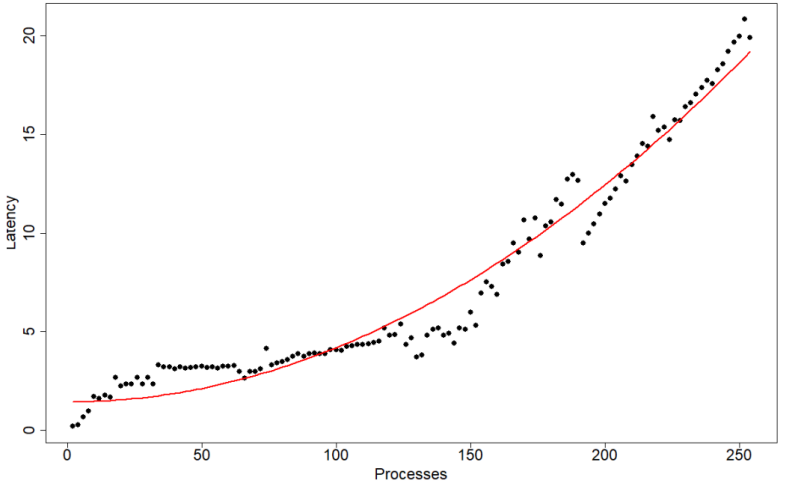




$$latency = 1.997 + 9.034e^{-7} processes^3$$

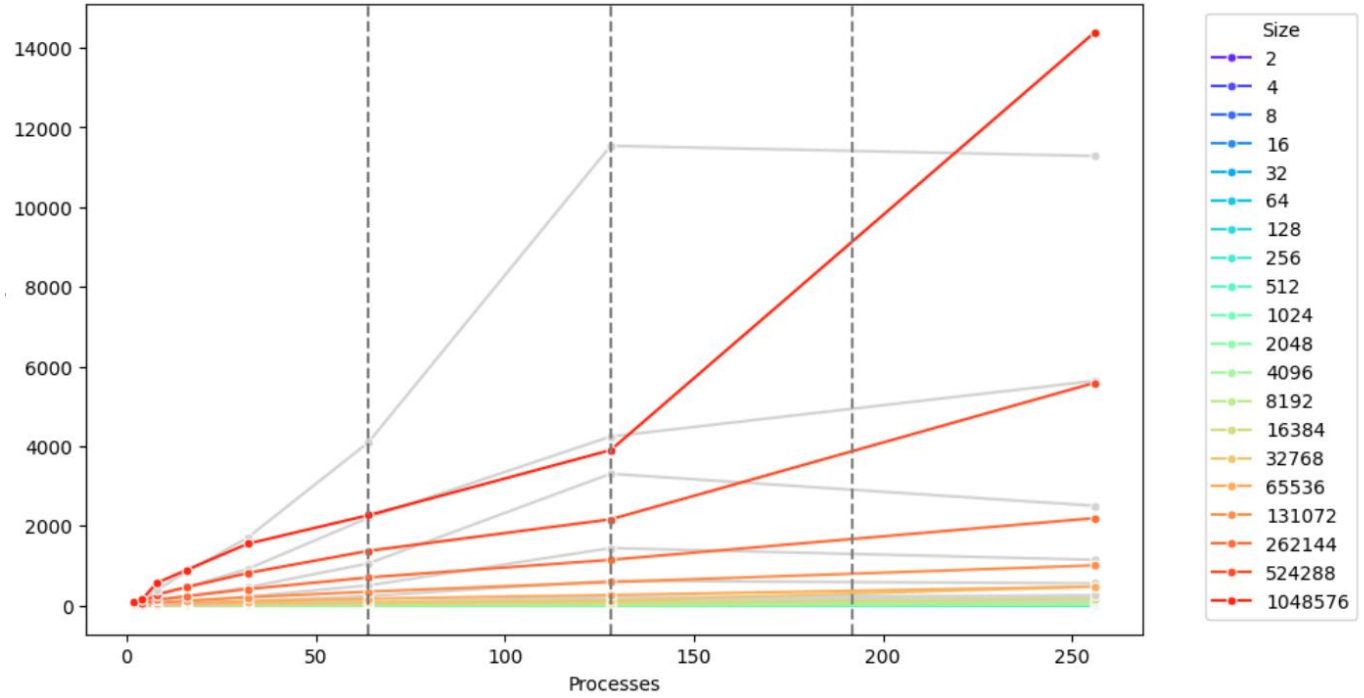
Split Binary Tree Broadcast

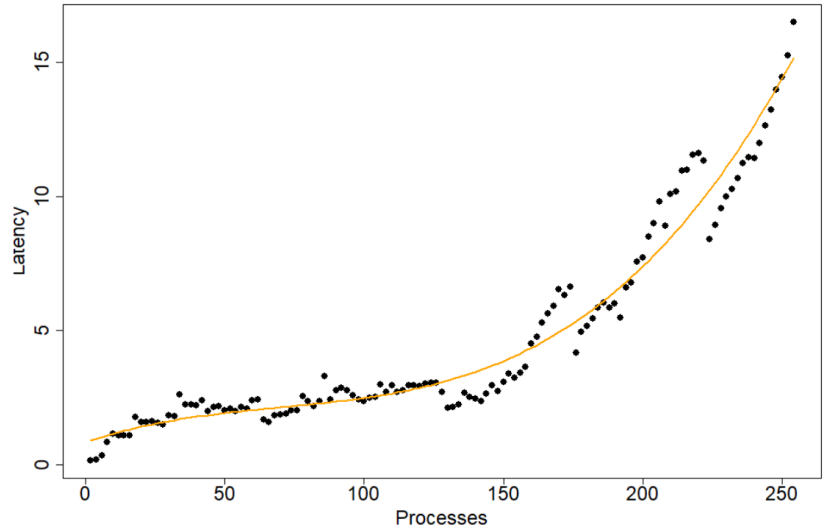




$$latency = 1.441 + 2.750e^{-4}processes^2$$

Binomial Tree Broadcast

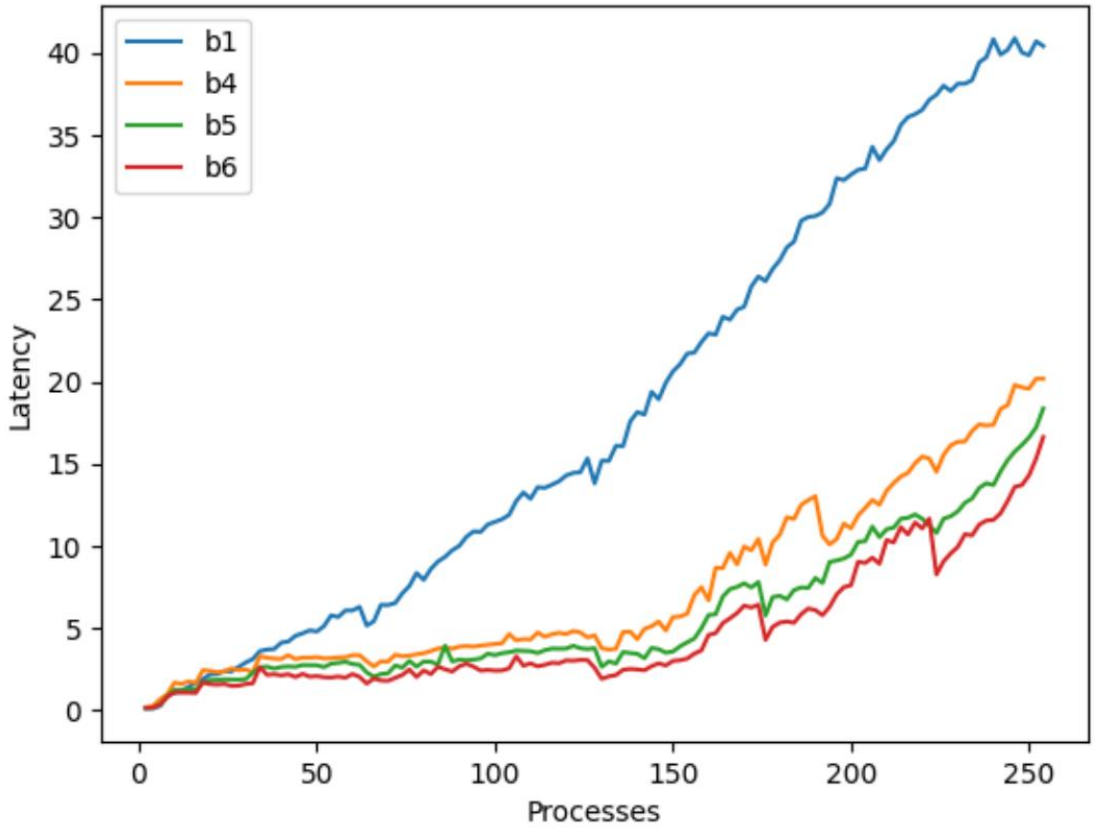




$$latency = 8.254e^{-1} + 3.620e^{-2}proc$$

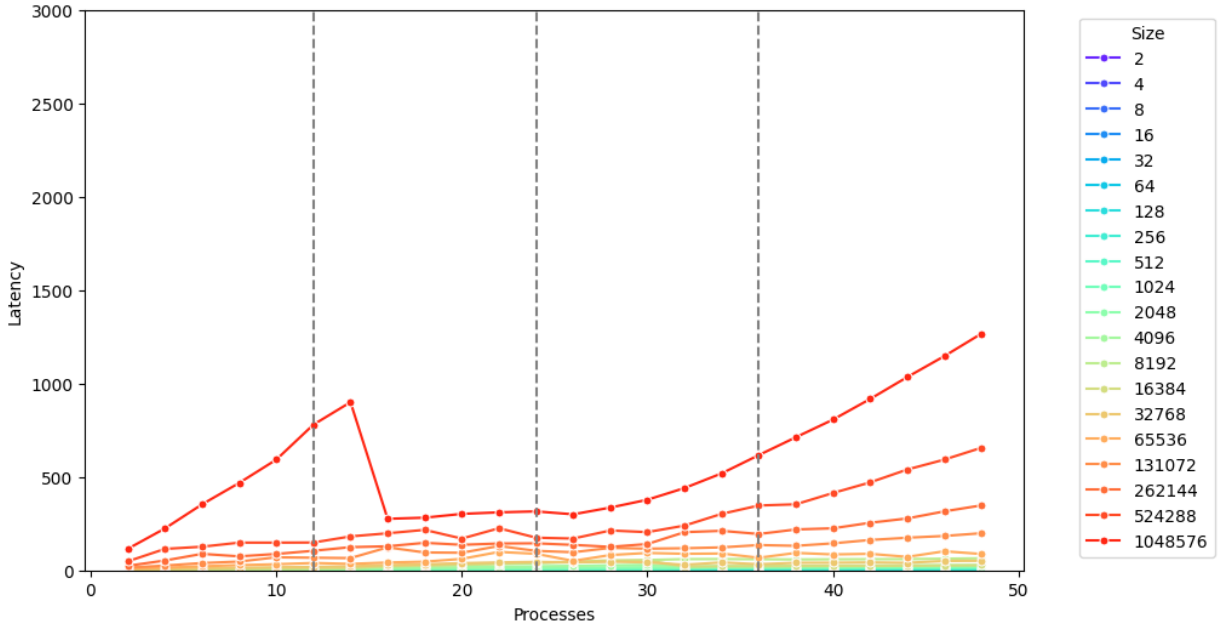
$$-3.745e^{4}proc^{2} + 1.789e^{-6}proc^{3}$$

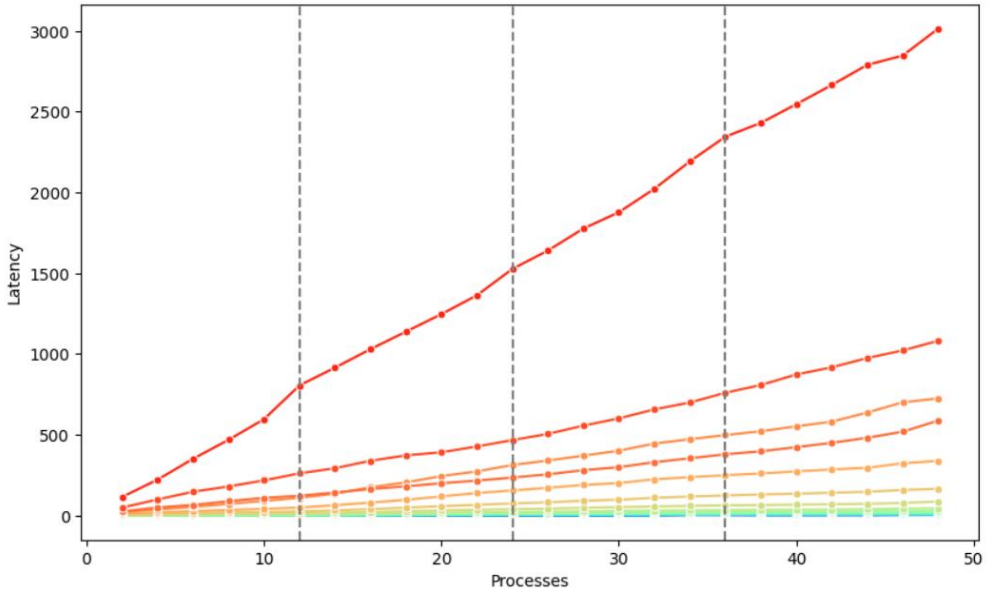
Comparison

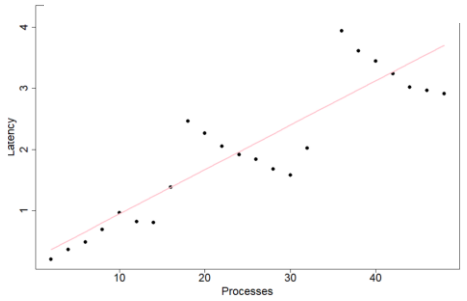


	fixed size		fixed processes	
	2byte	1MB	2 procs	256 procs
b1	38.09	11204.30	**78.49**	11244.70
b4	6.96	**10046.22**	90.88	**10130.14**
b5	5.35	11400.35	88.58	11483.58
b6	**4.42**	14300.55	86.76	14382.89

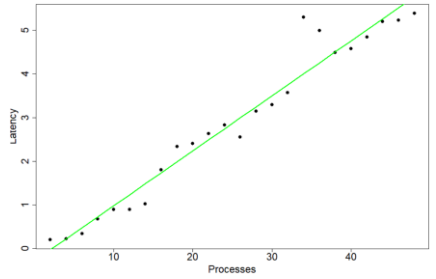
Scatter ignore/linear





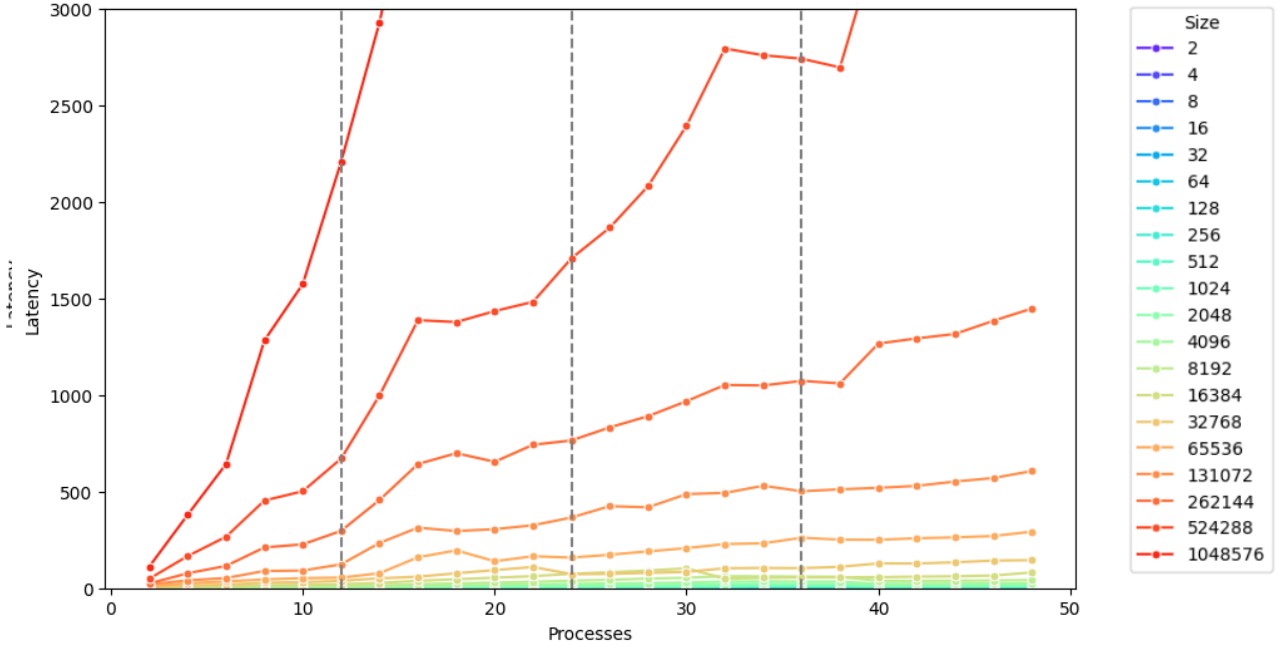


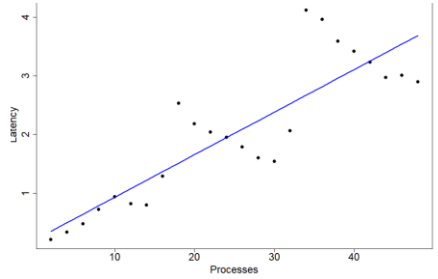
$$latency = 2.0338 + 4.9285processes$$



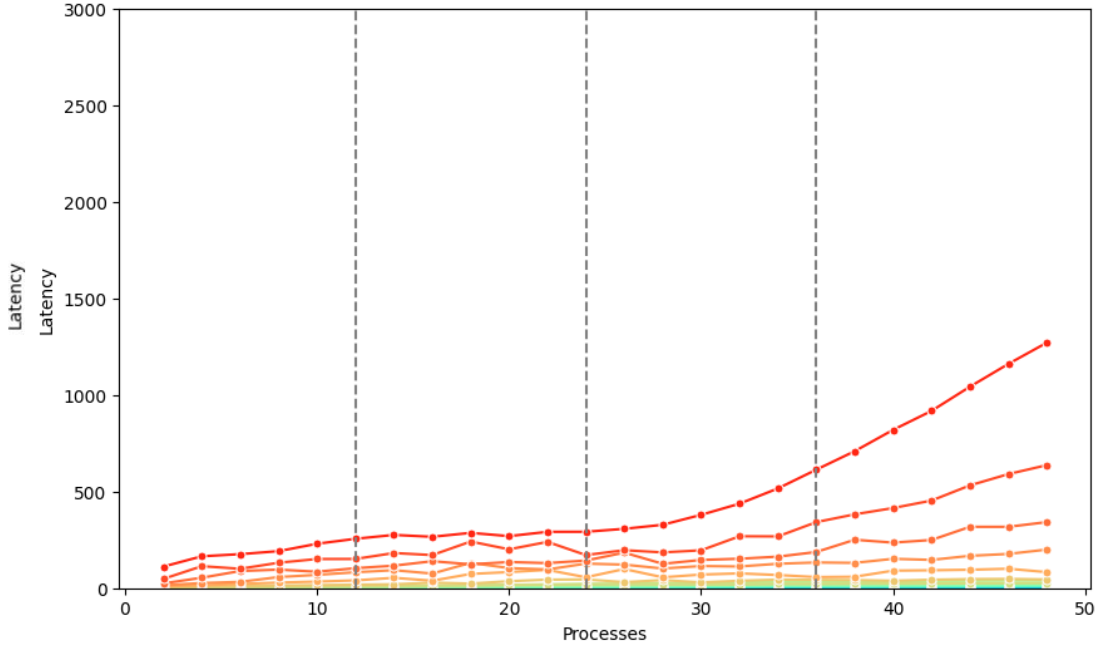
$$latency = -0.283261 + 0.125980processes$$

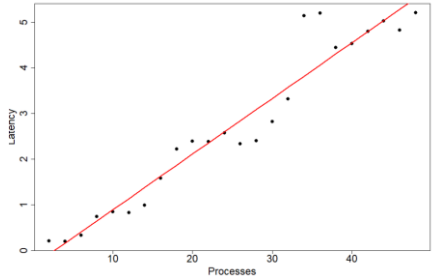
Scatter Binomial/Linear nb





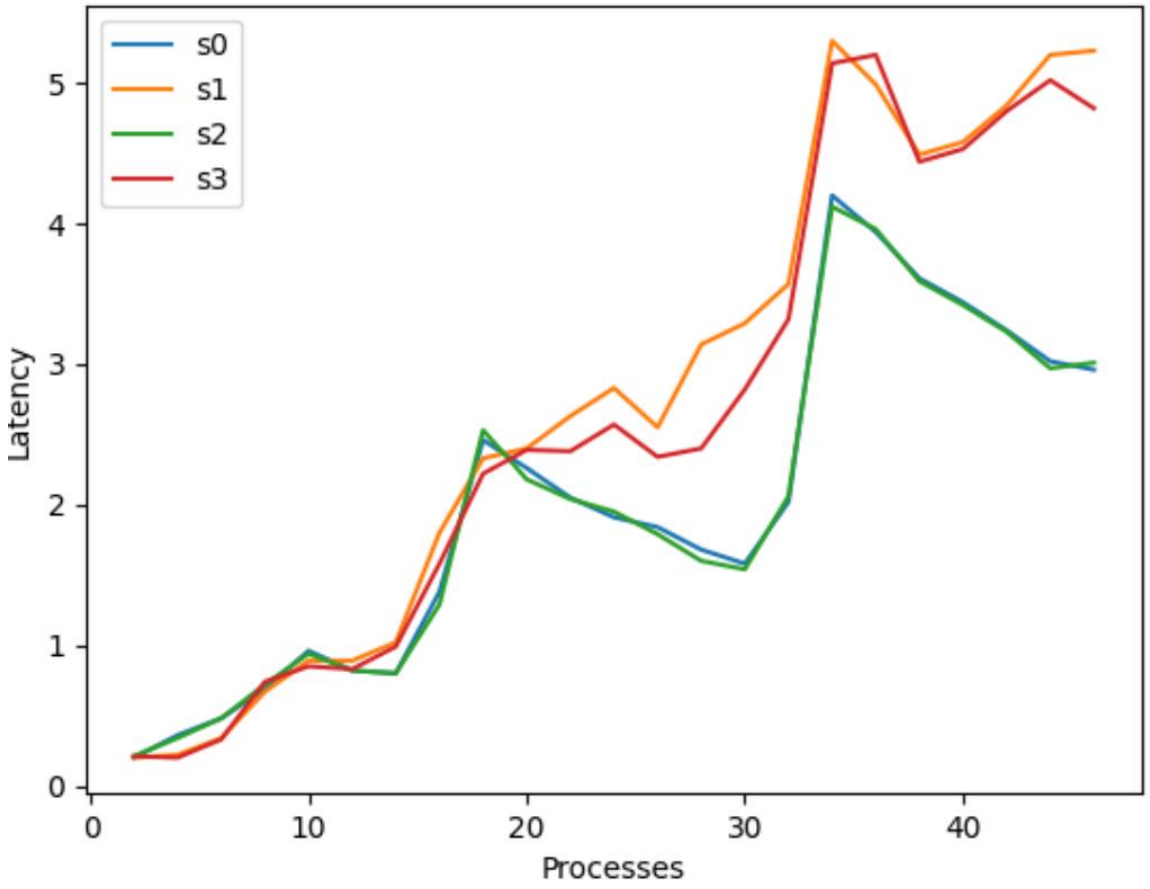
$$latency = 0.21 + 0.072processes$$





$$latency = -0.323080 + 0.121807processes$$

Comparison



	fixed size		fixed processes	
	1byte	1MB	2 procs	256 procs
s0	**2.64**	**1151.81**	115.11	**1264.28**
s1	5.25	2899.99	114.51	3009.25
s2	2.57	8081.88	111.52	8190.83
s3	4.93	1158.85	**111.32**	1265.24