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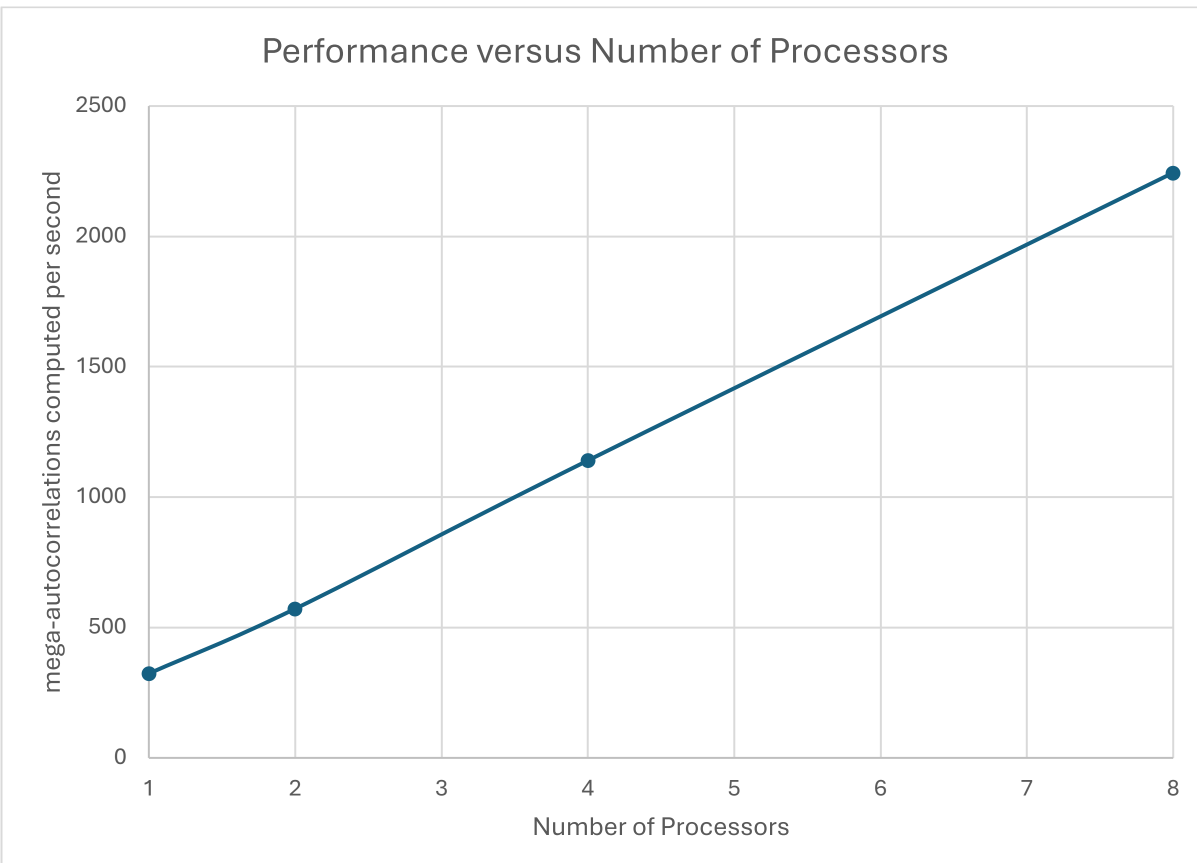
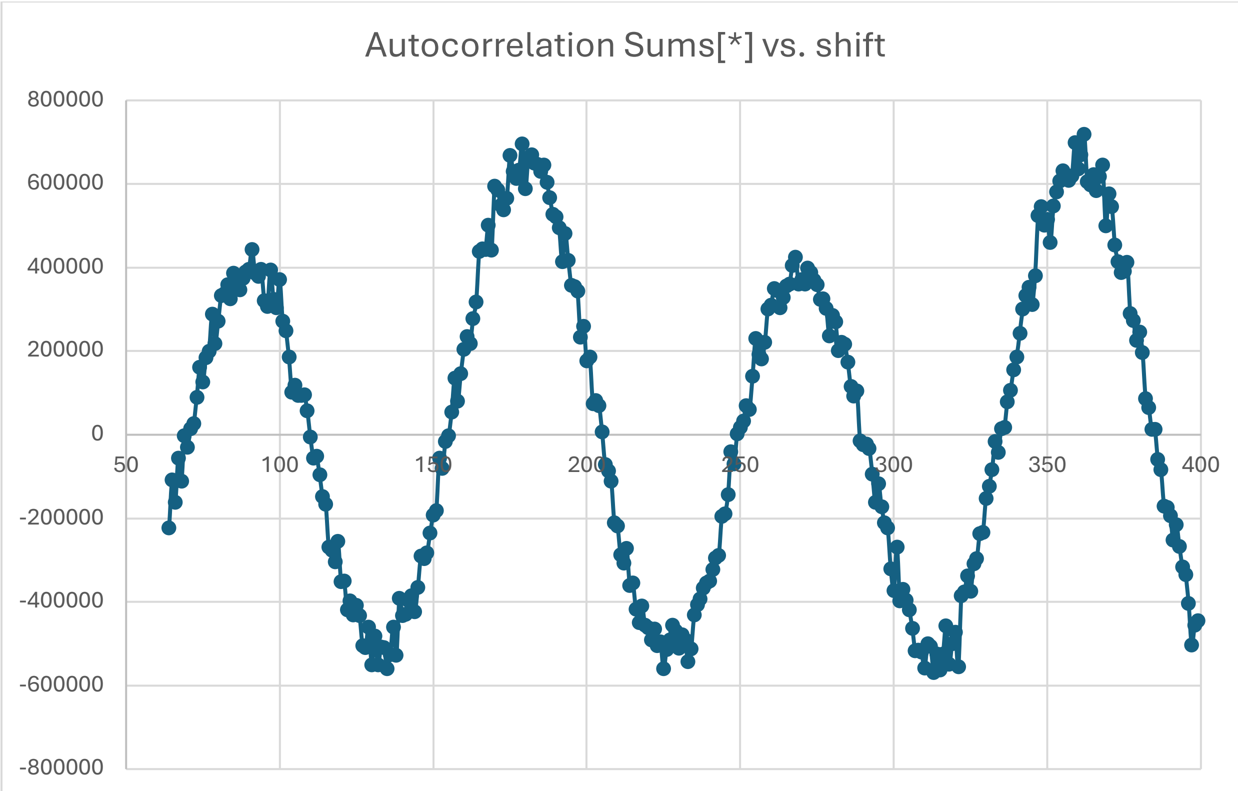
Project #7 - Autocorrelation using MPI

Processors	Performance
1	323.37
2	571.99
4	1140.59
8	2244.26





- **Period #1**: (distance of horizontal x-axis between successive tall peaks) **180**
- **Period #2**: (distance between short peak and the next tall peak) **91**
- In the Performance versus Number of Processors graph, shows a positive correlation, the more number of processors used the higher the performance (mega-autocorrelations computed per second). On a larger dataset such as (8388608 elements), MPI performance is higher than low dataset-size. A large data-set can take advantage of more processors or give each processor more data to handle compared to smaller dataset. This explains the positive correlation between performance and number of processors in the graph.
- MPI_Scatter divides NUMELEMENTS of the array into almost equal pieces for the NumCPUs. We need MAXSHIFTS more data values (PPSize+MAXSHIFTS) for each CPU in OpenMPI. By graphing Sums[*] as a function, we can reveal regular patterns in a supposedly random signal. The pattern in the signal graph reveals repeating pattern or autocorrelation, the correlation of a signal with a delayed copy of itself as a function of delay.