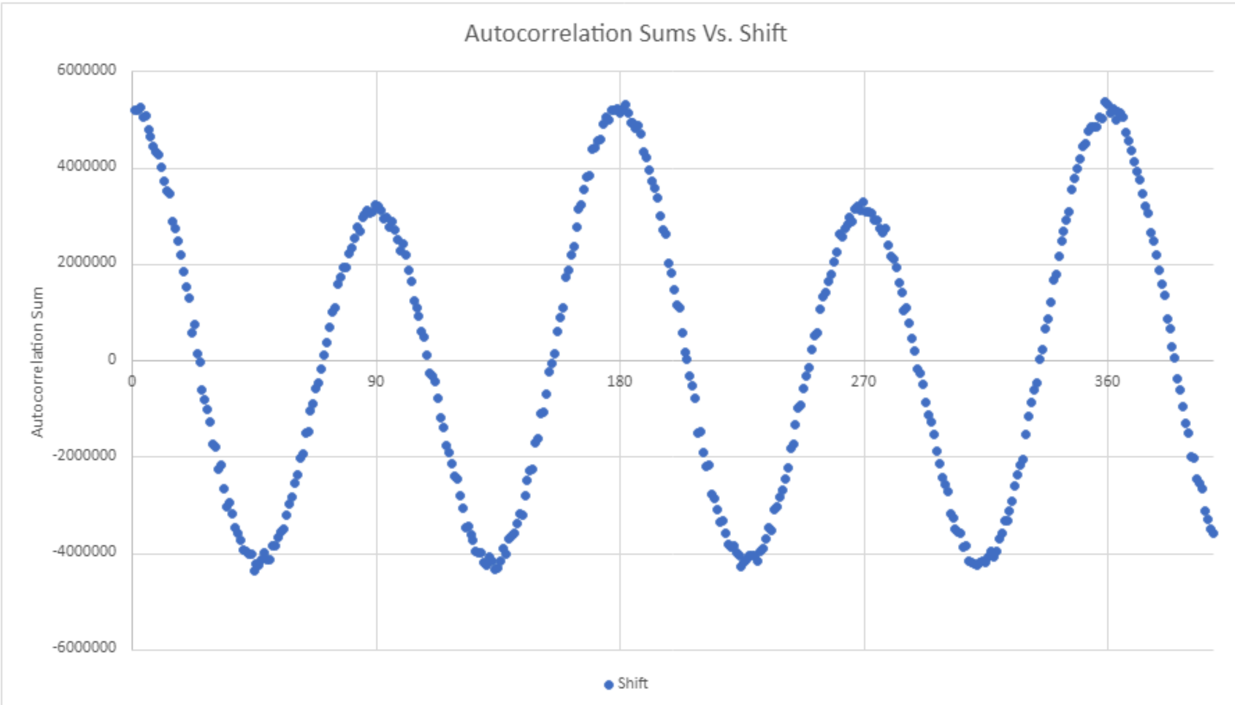
Autocorrelation using MPI

Kensan Putra

putrak@oregonstate.edu

Show the Sums{1] ... Sums[399] vs. shift scatterplot.

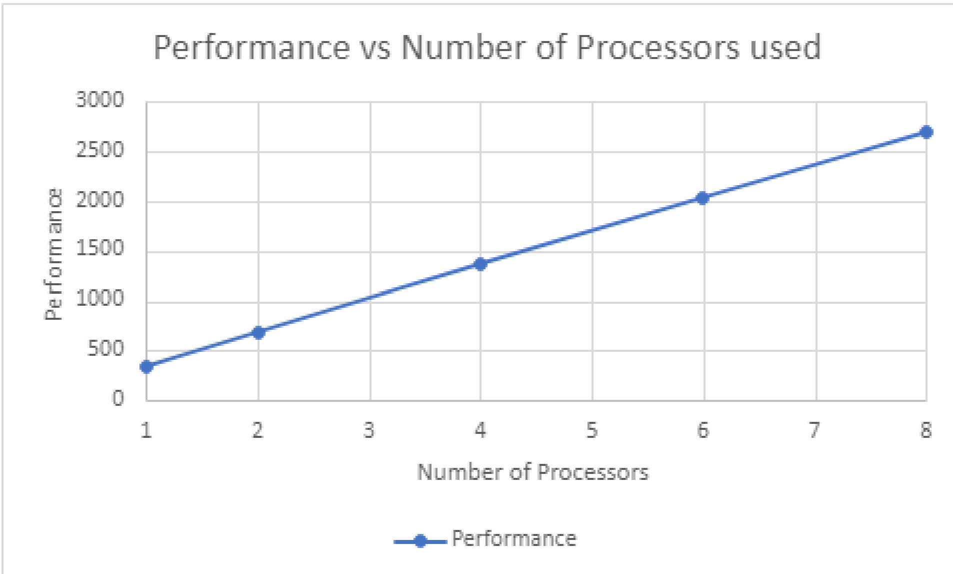


State what the two secret sine-wave periods are.

There are two sine wave periods:

- Main Sine Wave Period, distance between two successive waves would be from: 360 - 180 = 180 shifts
- Harmonic Sine Wave Period, distance between a small hump and the next larger hump would be from: 180 - 90 = 90 shifts

Show your graph of Performance vs. Number of Processors used.



What patterns are you seeing in the performance graph?

The performance has a linear increase as we increase the number of processors used, but the increase in performance from 6 to 8 processors is not as high as the increase from 4 to 6 or 2 to 4. This suggests diminishing returns as more processors are added.

Why do you think the performances work this way?

In the beginning we are benefiting from parallelization the most with jumping from 2 to 4 processors, but as we add more processors the communication time between processors increases which means that we are not spreading the problem among enough threads to get good parallelism. Some processors may end up doing less work or waiting for other processors to complete their tasks, which means we are not really benefiting from parallelism as much.