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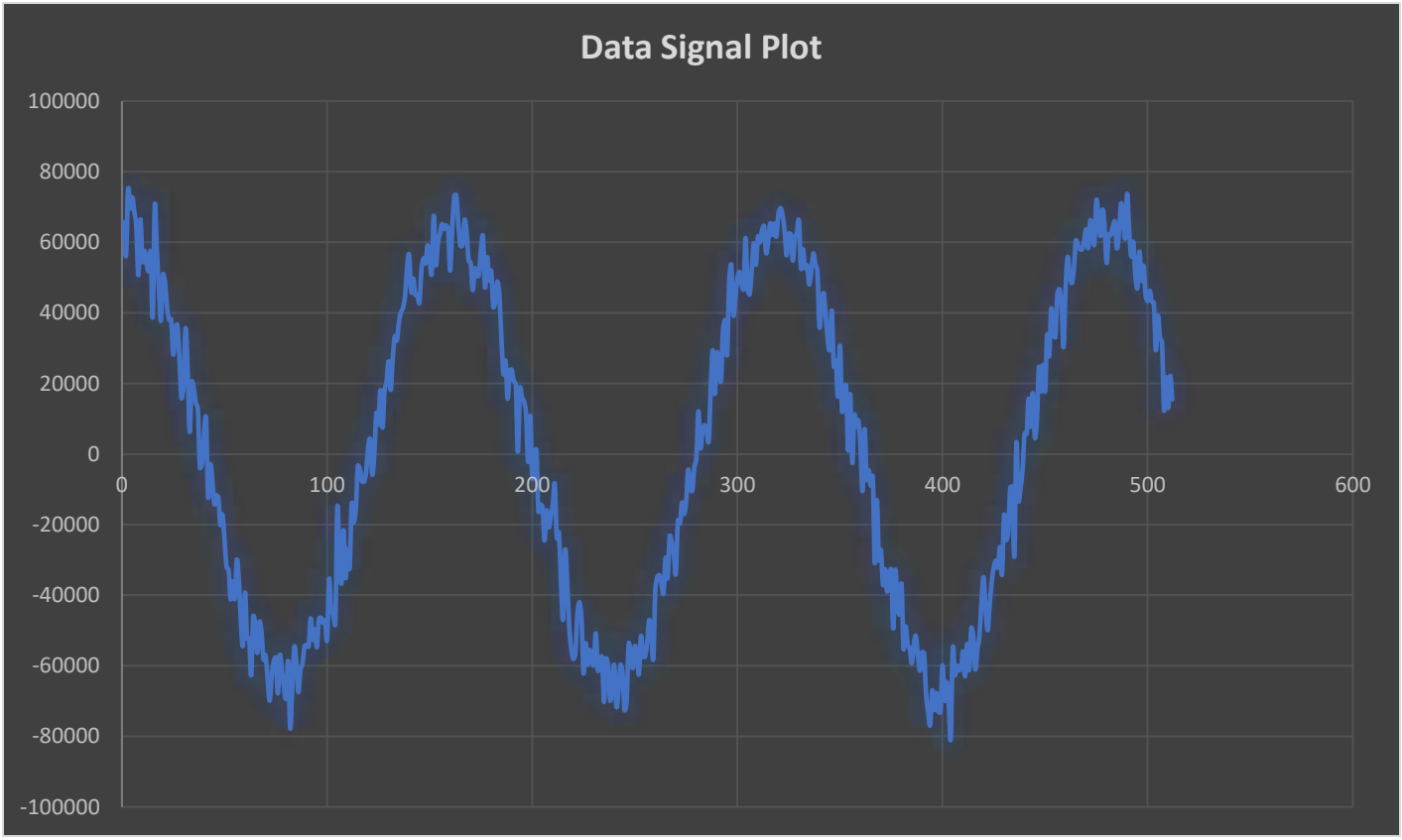
CS-475

Project 7b – written commentary

1. What machine did you run the test on?

I got the best results for OMP and SIMD on the Rabbit server and the best result for OpenCL on the DGX server, so the chart will contain all four tests run on Rabbit and an OpenCL result from DGX.

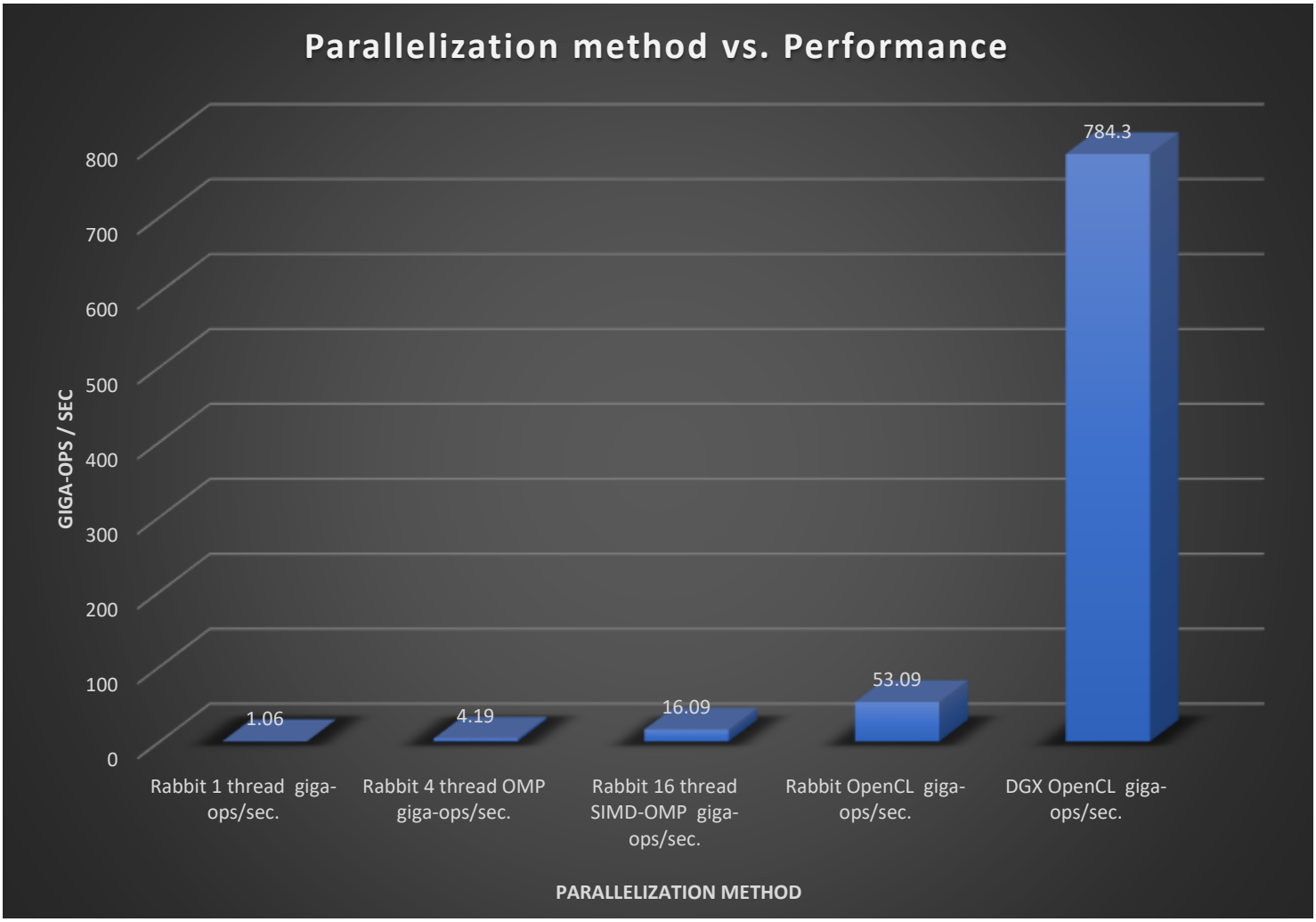
2. Show the sums[1] … sums[512] scatterplot.



3. State what the hidden sine-wave period is, i.e. at what multiples of shift are you seeing maxima in the graph?

The period is roughly 160 samples between peaks. The graph shows peaks around sample 0, 160, 320, and 480.

4. What patterns are you seeing in the performance bar chart? Which of the four tests is the fastest? By a little, or by a lot?



The OpenCL performance on the DGX server is far and away the highest performer. It is nearly 800 times faster than the control test with a single thread. The OpenCL performance on the Rabbit server is still more than 50 times faster than the control and many times faster than the traditional CPU based methods. The four thread OpenMP performance, when compared against the single threaded version, shows a perfect speed up of around four, and the OpenMP and SIMD performance shows a perfect speed-up of around sixteen.

5. Why do you think the performances work this way?

The four core OMP implementation is four times faster than the single threaded version because it is able to split the computations onto four separate cores. The version with SIMD added is able to also process four values simultaneously on each core, which leads to 16 times the performance. The DGX server offers many more cores which can operate in parallel.