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Project No: - Project#7

Project Name: - Fourier Analysis using MPI

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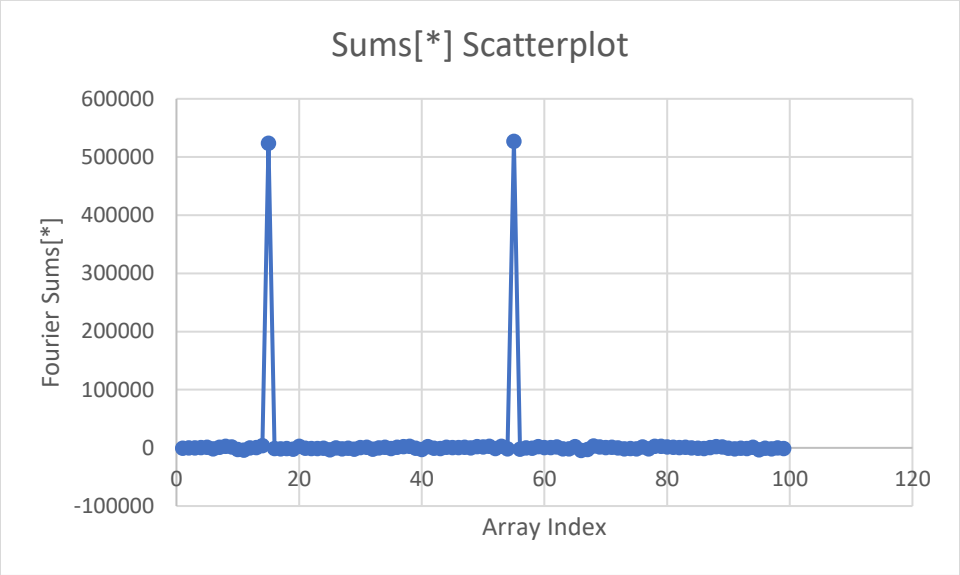
1. Show the Sums {*] scatterplot.

➔

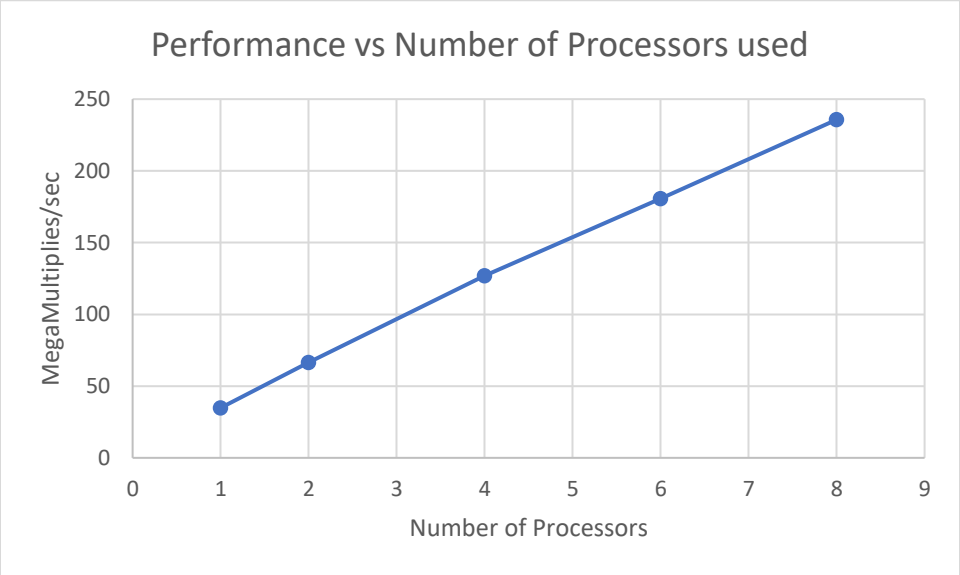


2. State what the secret sinewaves' periods are.

➔ The two secret sinewaves periods are: -

Array Index	Fourier Sum
15	523753.66
55	527281.62

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



4. What patterns are you seeing in the performance graph?
   ➔ The performance graph exhibits a generally linear trend, with an increase in performance as the number of processors rises. This upward trend reaches its peak at 220.97 when there are 8 processors.

5. Why do you think the performances work this way?
   ➔ MPI operates on the single-program-multiple-data model paradigm, facilitating parallel processing across multiple cores. By increasing the number of cores/processors utilized for computation, the available parallelism expands, resulting in improved performance. MPI is specifically designed to minimize communication and synchronization overheads. As the number of cores grows, these overheads diminish, enabling greater parallel processing capabilities. Consequently, it becomes evident that higher performance is achieved with an increasing number of processors.