HPC - LP.V BE Comp 53 Siddhesh Samgir

Assignment No - 4

TSSM

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Problem Statement -

Implement HPC application for AI or ML domain.

Theory -

Parallel Computing for AI or ML.

Parallel computing is a computing architecture that enables multiple processor to perform computation simultaneously, allowing for faster processing times & improved performance.

In AI & ML, parallel computing is typically acheived by distributing the computation across multiple GPU or CPU cores. This allows for the computation to be performed in parallel, reducing the training time significantly.

Another area where parallel computing used in AI & ML is in data processing. In many AI & ML application, large amount of data need to be processed which can be time consuming & computationally intensive. By using parallel computing the data can be split into smaller chunks, with each chunk being processed by a different GPU or CPU core.

* Implementation:-

Here is an example program in Python that implement parallel programming for data processing in the AI/ML domain using the multiprocessing module.

Algorithm:
In this program, we first define a function process_data that represent our data processing logic. This function takes a chunk of data as input processes it & return the processed data.

Next, we create some sample data & split it into chunks of a specified size.

We then use the map method of the pool object to apply the process_data function to each data chunk in parallel. This method return a list of the processed data chunks.

finally we concatented the processed chunks into a single list & print the first 10 element of the processed data.

Note that this is a simplified example & in practice you may need to consider

additional factor such as data common load balancing & synchronization when implementing parallel programming for data processing in the AI/ML domain.

* Conclusion - *

In conclusion, parallel computing is key technology for improving the performance of AI or ML application.
By using parallel computing computation can be performed faster, large amount efficiently of data can be processed more efficienty & prediction can be made more quickly.

The use of parallel computing in AI or ML is leading to significant advance ment in these field making it possible to develope & developes more complex & sophisticated model.