

LP-5 Problem Statements

1. (HPC): Design and implement Parallel Breadth First Search and Depth First Search based on existing algorithms using OpenMP. Use a Tree or an undirected graph for BFS and DFS
2. (HPC): Write a program to implement Parallel Bubble Sort and Merge sort using OpenMP. Use existing algorithms and measure the performance of sequential and parallel algorithms.
3. (HPC): Implement Min, Max, Sum and Average operations using Parallel Reduction.
4. (HPC): **Write a CUDA Program for (Perform Any One):**
 - Addition of two large vectors
 - Matrix Multiplication using CUDA C

HPC Mini-Projects (Perform Any One):

- Mini Project: Evaluate performance enhancement of parallel Quicksort Algorithm using MPI
 - Mini Project: Implement Huffman Encoding on GPU
 - Mini Project: Implement Parallelization of Database Query optimization
 - Mini Project: Implement Non-Serial Polyadic Dynamic Programming with GPU Parallelization
5. (DL): **Linear regression by using Deep Neural network:** Implement Boston housing price prediction problem by Linear regression using Deep Neural network. Use Boston House price prediction dataset.
 6. (DL): **Classification using Deep neural network (Perform Any One):**
 - Multiclass classification using Deep Neural Networks: Example: Use the OCR letter recognition dataset <https://archive.ics.uci.edu/ml/datasets/letter+recognition>
 - Binary classification using Deep Neural Networks Example: Classify movie reviews into positive" reviews and "negative" reviews, just based on the text content of the reviews. Use IMDB dataset

7. (DL): **Convolutional neural network (CNN) (Perform Any One):**

- Use MNIST Fashion Dataset and create a classifier to classify fashion clothing into categories.
- Use any dataset of plant disease and design a plant disease detection system using CNN.

DL Mini-Project (Perform Any One):

- Mini Project: Human Face Recognition
- Mini Project: Gender and Age Detection: predict if a person is a male or female and also their age
- Mini Project: Colorizing Old B&W Images: color old black and white images to colorful images