



Birla Institute of Technology & Science, Pilani

Pilani Campus

II SEMESTER 2021-2022

Assignment-2

Course No.: CS F422

Course Title: Parallel Computing

Deadline: As per Canvas

Maximum Marks: 30M (15%)

Note:

- Maximum of one student per group.
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P1. Consider a text file (of atleast 10 MB in size) to be encoded using [Huffman codes](#). Now consider parallel algorithms for encoding a given text file and decoding a given encoded file respectively.

- (a) Using MPI, devise and implement algorithms for encoding and decoding.
- (b) Estimate the fraction of code executing sequentially using multiple experiments.
- (c) Given input size n and processors p , derive asymptotic expressions for time complexity, speed up, efficiency, cost and iso efficiency function.
- (d) Estimate the maximum number of processors that can be used to solve this problem cost-optimally.

Deliverables:

- Design Document (.pdf) explaining your design. Must contain answers for (b), (c), (d)
- Source code for a: `encode_parallel.c`, `decode_parallel.c`

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