



Birla Institute of Technology & Science, Pilani

Pilani Campus

II SEMESTER 2019-2020

Assignment-1

Course No.: CS F422

Course Title: Parallel Computing

Deadline: 27th Feb 2020

Maximum Marks: 48M (12%)

Note:

- Maximum of two students per group.
 - Upload code in <https://nalanda.bits-pilani.ac.in> Name your file idno1_idno2_assignment1.tar .
 - Group information to be entered here:
<https://docs.google.com/spreadsheets/d/1LIXZoELRUjaBApNaemFrqIeX03DmpP0KF50EVmn4z7A/edit?usp=sharing>
-

P1. You are required to implement a parallel algorithm for sorting a set of numbers given in a file 'input.txt' using [Bubble-sort](#) algorithm:

- (a) Algorithm must be designed to take maximum advantage of the number of processes specified at run time. Should be implemented using MPI.
- ~~(b) Must identify the tasks, communication patterns, task agglomeration, and task mapping strategies as per Foster design methodology-k~~ Explain the design of your algorithm.
- (c) Identify the theoretical Speedup possible
- (d) Evaluate the speedup achieved by running your program for a single processor and multiple processors in the increment of 1 processor at a time.

Deliverables:

- Design Document (.pdf). Must contain answers for (b), (c), (d)
- Source code - bubblesort_parallel.c

[24]

P2. You are required to implement a parallel algorithm for solving a system of linear equations given in a file 'input.txt' using [Gaussian Elimination method](#).

- (a) Algorithm must be designed to take maximum advantage of the number of processes specified at run time. Should be implemented using MPI.
- ~~(b) Must identify the tasks, communication patterns, task agglomeration, and task mapping strategies as per Foster design methodology-k~~ Explain the design of your algorithm.
- (c) Identify the theoretical Speedup possible
- (d) Evaluate the speedup achieved by running your program for a single processor and multiple processors in the increment of 1 processor at a time.

Deliverables:

- Design Document (.pdf). Must contain answers for (b), (c), (d)
- gaussian_parallel.c for (a)



Birla Institute of Technology & Science, Pilani
Pilani Campus

[24]

--&--