NAMAL UNIVERSITY
Department of Computer Science
BS Computer Science Program
7th Semester, Session 2020
Assignment 1

CS-420 Parallel and Distributed Computing Due Date: 24th Nov 2023

Max Marks: 10

Assignment Task

In this assignment you will be exposed to different models of parallel computation. The goal is simply to say "hello world" through different tools and environments so you know how to access them.

We will use four combinations of tools and environments: **MPI on a cluster, Star-P on a cluster, Julia on Amazon Elastic Compute Cloud (EC2), and Julia on multi-core**. There is nothing too special about these combinations; it is also possible to run MPI on EC2 or Julia on a cluster, for example.

The tools and environments you will use are:

1. MPI on a cluster
2. MATLAB® with Star-P
3. Julia on EC2
4. Julia on multi-core

For each section of the assignment, copy a transcript of the interesting parts of your terminal session to a text file.

Sample Files: MPI example program in C (https://ocw.mit.edu/courses/18-337j-parallel-computing-fall-2011/resources/mpipi/), MPI example program in Fortran (https://ocw.mit.edu/courses/18-337j-parallel-computing-fall-2011/resources/mpipi-1/)

NOTE: The homework assignments for this class require access to the following online development tools.

Message Passing Interface (MPI): Standardized and portable message-passing system designed by a group of researchers from academia and industry to function on a wide variety of parallel computers.

Star-P: Technical computing software that offers an open platform architecture that helps to integrate software and hardware from various high-performance computing (HPC) sources, and supports popular desktop tools, numerical libraries and hardware accelerators.

The Julia Programming Language: A high-level, high-performance dynamic language for technical computing, with syntax that is familiar to users of other technical computing environments. It provides a sophisticated compiler, distributed parallel execution, numerical accuracy, and an extensive mathematical function library.

Amazon Elastic Compute Cloud (Amazon EC2): A web service that provides resizable compute capacity in the cloud. It is designed to make web-scale computing easier for developers.

Hadoop MapReduce: A programming model and software framework for writing applications that rapidly process vast amounts of data in parallel on large clusters of compute nodes.