

Department of CSE, The University of Texas at Arlington

**CSE5351/CSE4351: Parallel Processing
Spring 2020**

Homework Assignment 4

Assigned on April 14, 2020

Write a **data-parallel** program using **distributed non-shared memory mode** as taught in the class for the **sieve of Eratosthenes**. Use MPI for message passing and test the program on the workstation cluster.

The program has two inputs: The **largest number, n** , up to which the prime numbers are to be found, and, **p , the number of processors**. The program should run for any number of processors ranging from **1 to 32**.

Make the rest of the assumptions yourself but your grade will be based on how good your parallelization and communication scheme is. So feel free to make optimizations. Attach a note on your parallelization scheme. The output of your program is the prime numbers found by your program.

Also implement the sequential program and calculate and make the plot for the following:

1. Execution time versus the number of processors for 1, 2, 4, 8, 16, 32
2. Execution speedup versus the number of processors for 1, 2, 4, 8, 16, 32
3. Efficiency versus the number of processors for 1, 2, 4, 8, 16, 32

SUBMISSION: WHAT, WHEN & HOW

This assignment is due on or before April 24, 2020

Email your assignment including your source code and a note to the teaching assistant, saifullah.khalid@mavs.uta.edu.

The questions are clear. If something is not defined, you can make assumptions but you must state those assumptions in your homework.