**ITS 470**

**Fall 2017 Take-home test**

**Due: 10:59PM, December 10, 2017**

**30 points**

Write the parallel code to find the frequency of the number using MPI master/slave model. Master should read the number to find from the command line input, read the data from input file, decompose the input data, and assign decomposed input data to each slave uniformly. Once all slaves finish their finding, they should pass their results and master displays the frequency of finding number of each slave and the total frequency of the finding number in the end. Your MPI code should be flexible enough to run with any number of processor(s) for any input size. You should distribute the input data as uniform as possible. The output example with 5 processors is shown below. Submit your report with source code. Your report should explain your code such as structure of your code, parallelization method (i.e., data decomposition), data distribution, and collection (i.e., communication method) with pseudo code. Your code should include the comments and also should be compiled and run. Your score is based on your explanation in your report and completion of the code. (15 points for the algorithm and logic, 10 points for the explanation and documentation, 5 points for the completion)

-bash-4.1$ mpirun -n 5 mpi-search 11

Number to find is 11

My id is 1 and the frequency of 11 is 1

My id is 2 and the frequency of 11 is 3

My id is 3 and the frequency of 11 is 7

My id is 4 and the frequency of 11 is 2

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The total frequency of 11 is 13

-bash-4.1$

**Input file name**: “Input1.dat”

**Submission**: Report in MS office file should include your pseudo code and source code. You should submit your source code separately, too. Both files should be zipped and use file name of “**ITS470-Takehome-Youname.zip**”.