CS370 Exam
MapReduce and MPI

This exam is openbook.

1. What is the output of the following mapper if the function **f(x) = sqrt(x)** is applied to the following?

    a. A = [1 4 9 16]
    b. B = [16 16 16 16]

2. What is the output of the following reducer if the function "**+**" is applied to the following?

    a. A = [1 4 9 16]
    b. A = [1]

3. Write an MPI program that does the following.

Given an integer N:
- The manager randomly selects a worker and sends N to that worker
- If the worker receives N for the first time it increments N by 1 and send the result back to the manager
- If the worker has previously received a value from the manager, it decrements N by 1 and send the result back to the manager
- The manager then selects another worker randomly and sends the new N value and send it to that worker
- The manager repeats this 10 times.

Additional requirements:
- Please use **srand(get_pid())** to for random number for both workers and manager
- The workers should print the N after receiving it from the manager.