Homework Assignment 9
Due Fri, Nov 3 at 6 pm
Note change in due date

For this assignment you should write a Pthreads program in which the main thread reads in

1. An int \( n \)
2. Two arrays, \( x \) and \( y \), each consisting of \( n \) doubles
3. A double \( \alpha \).

This data and the number of threads should be stored in global memory so that it’s accessible to all of the threads. The main thread should get \texttt{thread\_count}, the number of threads, from the command line. This should also be stored in global memory. \textit{These are the only variables that should be stored in global memory.} All other variables should be stored in the local memory of the thread that uses them.

After getting \( n \) from the user the main thread should allocate storage for \( x \) and \( y \) using \texttt{malloc} and then read them in.

After the storage is set up, the main thread should start \texttt{thread\_count} threads.

The program should compute the update to \( y \) given by

\[
\text{for (i = 0; i < n; i++)} \\
\quad y[i] += \alpha \times x[i]
\]

However, the computation should be distributed among the threads using a block distribution of \( x \) and \( y \). So if \texttt{local\_n = n/thread\_count}, thread 0 will be responsible for the first \texttt{local\_n} elements of \( x \) and \( y \), thread 1 for the next \texttt{local\_n}, etc.

When a thread finishes its calculation, it can return. After all the threads have finished, the main thread should print the contents of \( y \).

You can assume that \texttt{thread\_count} evenly divides \( n \) and that the input is correct.