Anisha Aggarwal
Lab Assignment 2

To compile and link:
make -f makefile_1 clean
make -f makefile_1
make -f makefile_2 clean
make -f makefile_2
make -f makefile_3 clean
make -f makefile_3

Run Executables:
./invert_1 image_list.txt
./invert_2 image_list.txt
./invert_3 image_list.txt

Files will be stored:
invert_1 files: STEP_1/
invert_2 files: STEP_2/
invert_3 files: STEP_3/

Describe in your own words the three different ways the distortion of the 20 images are parallelized.
In all three parts, we were asked to read in a txt file that lists up to 20 images.
In the first part, we were asked to write a program that would use the tbb parallel_for to parallel distort each image, however doing each image serially.
In the second part, we were asked to write a program that would use tasks to distort multiple images in parallel using the serial method on each image.
In the final part, we were asked to write a program that would use the tbb parallel_for to distort each image, as well as using tasks to distort multiple images at once.

Also, compare and discuss the runtimes of the three different implementations.
invert_1 average time was: 4023.766 million cycles
invert_2 average time was: 2128.975 million cycles
invert_3 average time was: 2586.198 million cycles

As we can see, invert 2 was significantly better than invert 1 because even though the distortion was running in serial, running multiple images at the same time was significantly faster. I would have expected that invert 3 would have been faster than both invert 1 and invert 2, however it seems to be very close to invert 2.

*note: invert 3 has a very low success rate, I was running into malloc issues. invert 1 and 2 also occasionally ran into errors, but it had a higher success rate. Timings are based off of successful runs.