Percolation Assignment Analysis:

1. Doubling N (for loop in static void main takes average of 5 trials) with T = 10

	Average time for 5 trials			
N	PercolationDFS	PercolationDFSFast	PercolationUF with QuickFind	PercolationUF with QuickUWPC
50	0.0113	0.0139	0.0131	0.008
100	0.045775	0.0284	0.1474	0.0158

- On average for PercolationDFS, when N doubles run time quadruples.
- On average for PercolationDFSFast, when N doubles run time doubles.
- On average for PercolationUF with QuickFind, when N doubles run time multiplies by 10.
- On average for PercolationUF with QuickUWPC, when N doubles run time doubles.

2. Doubling T (for loop in static void main takes average of 5 trials) with N = 50

	Average time for 5 trials			
T	PercolationDFS	PercolationDFSFast	PercolationUF with QuickFind	PercolationUF with QuickUWPC
50	0.1650	0.0321	0.1263	0.0328
100	0.3123	0.0613	0.2466	0.0633

- On average for PercolationDFS, when N doubles run time doubles.
- On average for PercolationDFSFast, when N doubles run time doubles.
- On average for PercolationUF with QuickFind, when N doubles run time doubles.
- On average for PercolationUF with QuickUWPC, when N doubles run time doubles.

3. In each case with N, scaling N by a constant yielded an output that was also scaled by a constant. While these two constants were not always the same, the general trend simplifies to O(n). This same trend was observed when changing T. This makes the run time formula O(NT) for each of the four cases.

4. To calculate the largest grid that can be processed in one day, I checked how many times an initial grid of size N by N can be processed in one day (call that number "K"). This was done by dividing the total number of seconds in one day by the runtime of an individual grid. This would eventually tell me how many individual sites can be processed in a day based on the percolation thresholds. Then, by multiplying K by the size of a single grid (in this case that would be N*N), I got the total number of sites that were processed. The square root of that number represents the side of a square grid containing the number of boxes that the computer was able to process in one day.

	N for largest grid that can be processed in 24 hours			
T	PercolationDFS	PercolationDFSFast	PercolationUF with QuickFind	PercolationUF with QuickUWPC
100	26,299	59,360	29,595	58,415

5. PercolationDFS and PercolationDFSFast use ints in their grids which uses $4N^2$ bytes of memory while either of the PerocolationUF objects (the ones using QuickFind and QuickUWPC) use Booleans which means they use N^2 bytes of memory.