HPC HW 3

February 6, 2019

1 HPC HW3 Report

1.1 1. Objective of the Project

The objective of this assignment is to gain experience using openMP by parallelizing a simple image processing algorithm that blurs an image.

1.2 2. Project Implementation Details

I completed this assignment by parallelizing the first for loop using the openmp package. In order to avoid race conditions I copied the image into another data buffer.

1.3 3. Results

The following results were attained by running my parallelized implementation for $1, 2, 4, 8$ and 16 cores for an 8 core machine.

```python
In [1]: import matplotlib.pyplot as plt
        cores_number = [ 1,2,4,8,16]
        run_time = [3.835470,1.967301,1.076854,0.919150,0.899106]
        plt.figure(figsize=(10,8))
        plt.title("Scalability (Run Time vs. Cores)")
        plt.plot(cores_number,run_time,'*-')
        plt.xlabel('# Cores')
        plt.ylabel("Run Time (secs)")
        plt.show()
```

Scalability (Run Time vs. Cores)
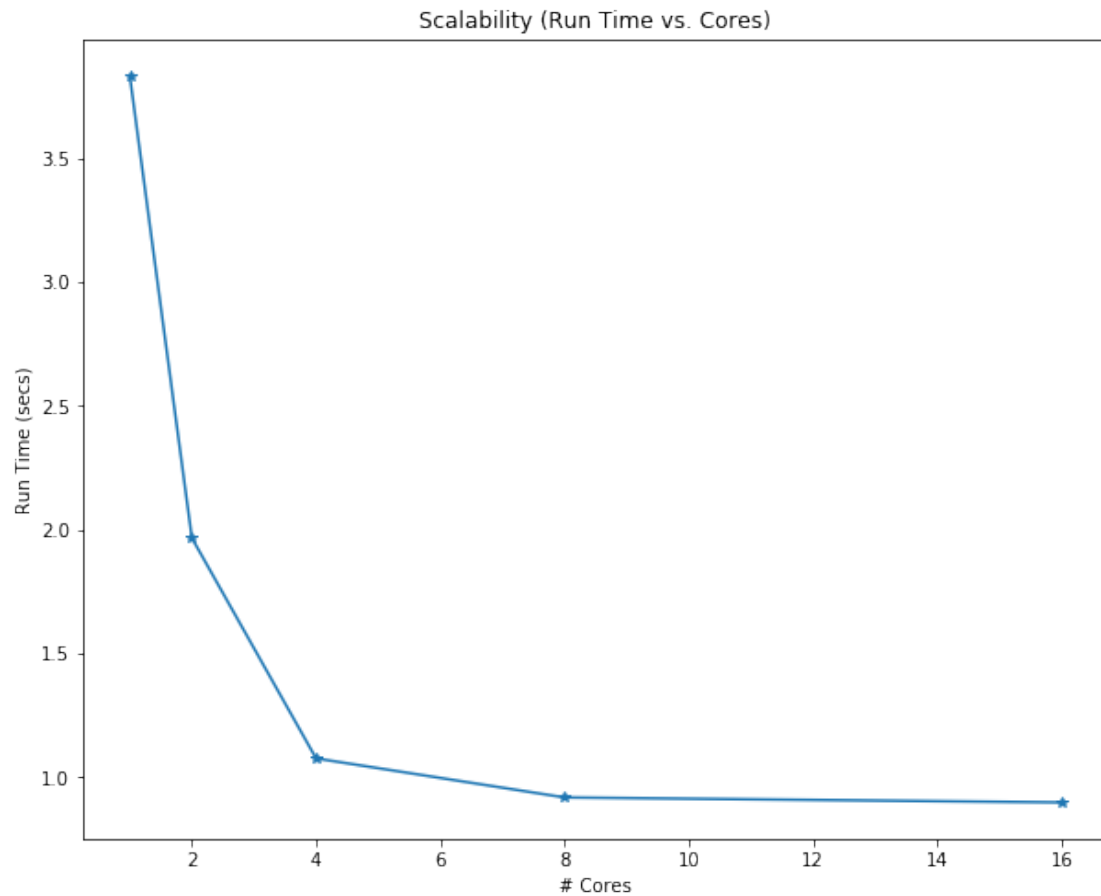
1.4 4. Modifications (Improve Performance)

One modification I experimented with was parallelizing both for loops using the "collapse()" function, however the performance gain was negligible.