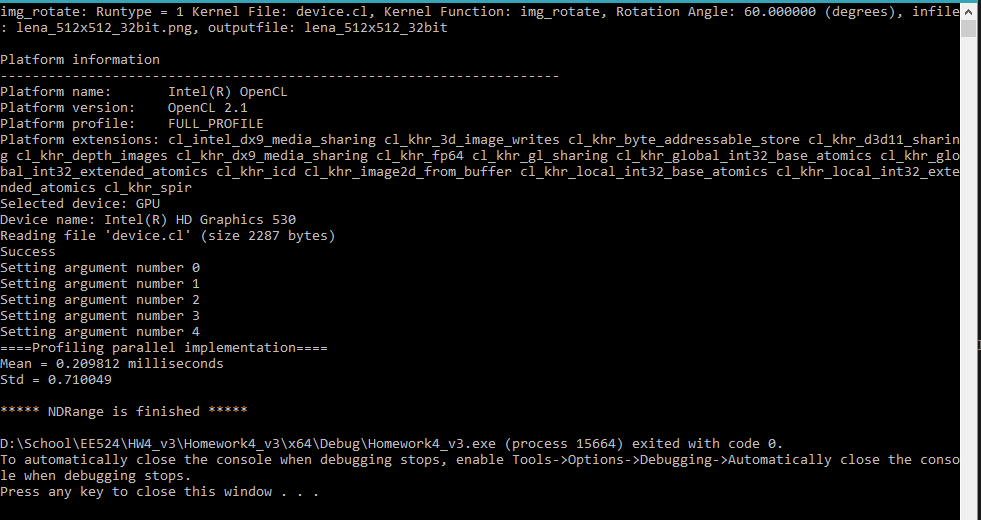
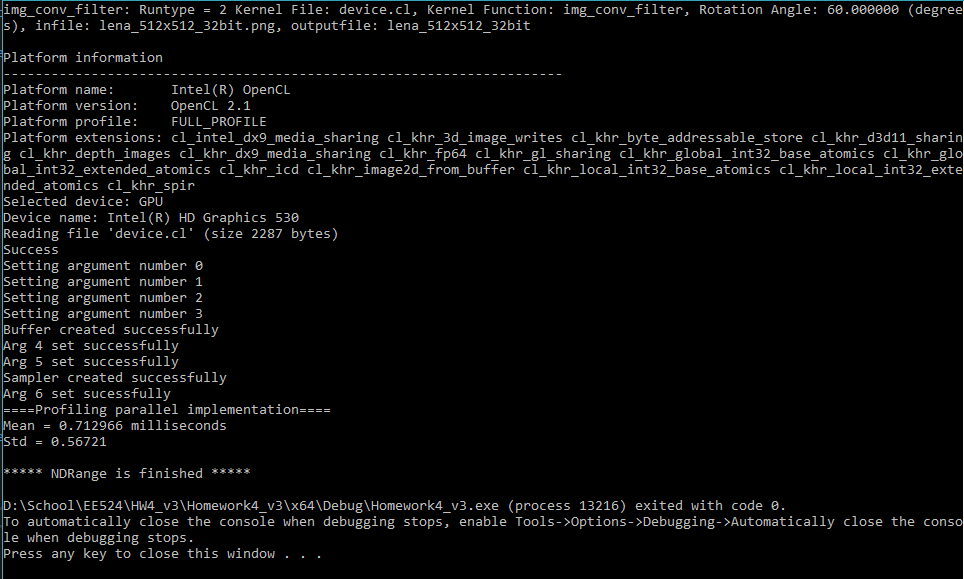
# Rotate Kernel – CLI 1 60 lena\_512x512\_32bit.png lena\_512x512\_32bit





# Blur Kernel – CLI 2 60 lena\_512x512\_32bit.png lena\_512x512\_32bit

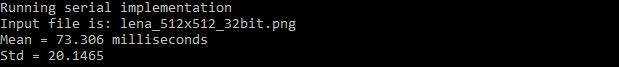




# Parallel vs serial

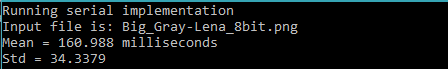
### lena\_512x512\_32bit





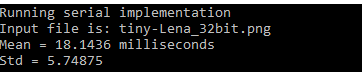
### Big\_Gray-Lena\_8bit





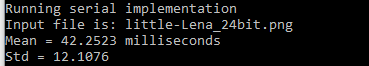
### tiny-Lena\_32bit



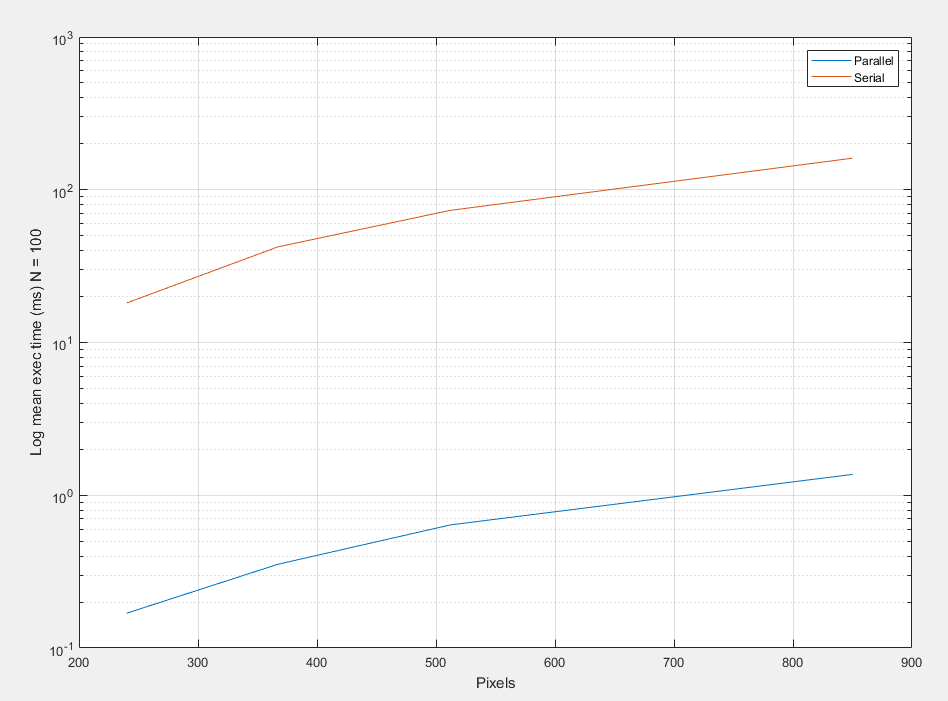


### little-Lena\_24bit





# Parallel vs Serial execution times



# Blur filters for 5-, 7-, and 9-wide kernels

### 5x5



### 7x7



### 9x9



# Operational Intensity

For an N\*N image and an M\*M kernel:

Assuming large N, M., edge cases are negligible

For N^2 pixels, do M^2 multiplies and M^2 – 1 adds:

For memory operations, the kernel must be read once, and the image must be read once and written once:

The OpI is