Homework 5

1. Run ./convolution_color 'bike.ppm' 100 on my mac.
Platform: Apple Device: HD Graphics 5000

8×8	12×12	16×16	20×20
0.002278 s	0.002434 s	0.002362 s	0.002334 s
109.255682 MPixels/s	102.247260 MPixels/s	105.327052 MPixels/s	106.633755 MPixels/s
3.496182 GBit/s	3.271912 GBit/s	3.370466 GBit/s	3.412280 GBit/s
21.154647 GFlop/s	19.797641 GFlop/s	20.393966 GFlop/s	20.646976 GFlop/s

The performance gets improved when the group size increases when N¿=12, but the performance is better when N=8.
Run ./convolution_color 'bike.ppm' 100 on cuda3.
Platform: NVIDIA Corporation Device: Tesla T10 Processor

8×8	12×12	16×16	20×20
0.001892 s	0.001889 s	0.001809 s	0.001915 s
131.494821 MPixels/s	131.720290 MPixels/s	137.563518 MPixels/s	129.916924 MPixels/s
4.207834 GBit/s	4.215049 GBit/s	4.402033 GBit/s	4.157342 GBit/s
25.460704 GFlop/s	25.504360 GFlop/s	26.635756 GFlop/s	25.155183 GFlop/s

The performance gets improved when the group size increases when N¡20, but gets worse when N=20.
2. Copy the output buffer buf_congray to the input buffer buf_gray in the loop.

```
for(int loop = 0; loop < num_loops; ++loop)
 {
    CALL_CL_SAFE(clEnqueueNDRangeKernel(queue, knl, 2, NULL,
          global_size, local_size, 0, NULL, NULL));
    CALL_CL_SAFE(clEnqueueCopyBuffer(queue, buf_congray, buf_gray, \\
    0, 0, deviceDataSize, 0, NULL, NULL));
  }
```

Output images are saved in 'output_clN..ppm' for N=100,1000,10000.