Homework 4
High Performance Computing 2015

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(a) Table 1 shows Pixels/s (Mp/s), the bandwidth (Gb/s), and the Flop/s (Gf/s) for image *bike.ppm* for 1000 iterations. On GeForce GTX TITAN Black performance gets better when we increase the work group size from 16×16 to 32×32. AMD Cypress and Intel HD Graphics 4000 don't support work group size greater than 256 and 512 respectively.

Word group size	**GeForce GTX TITAN Black**	**GeForce GTX 750 Ti**	**AMD Cypress**	**Intel HD Graphics 4000**
$8x8$	1651.525701 Mp/s 13.212206 Gb/s 79.944226 Gf/s	857.079568 Mp/s 6.856637 Gb/s 41.488039 Gf/s	208.825297 Mp/s 1.670602 Gb/s 10.108457 Gf/s	66.741965 Mp/s 0.533936 Gb/s 3.230731 Gf/s
16×16	2514.559123 Mp/s 20.116473 Gb/s 121.720468 Gf/s	911.011772 Mp/s 7.288094 Gb/s 44.098697 Gf/s	284.079608 Mp/s 2.272637 Gb/s 13.751239 Gf/s	63.425241 Mp/s 0.507402 Gb/s 3.070180 Gf/s
32×32	**2604.194548 Mp/s** **20.833556 Gb/s** **126.059387 Gf/s**	878.237898 Mp/s 7.025903 Gb/s 42.512235 Gf/s	- - -	- - -

Table 1: Runtime information for smoothing kernel on different devices

(b) Figure 1, 2, 3 shows *bike.ppm* after 1, 100 and 1000 iterations respectively. I just copy the output image of the kernel to input image using $clEnqueueCopyBuffer()$ function.

Figure 1: bike.ppm after 1 iteration

Figure 2: bike.ppm after 100 iterations

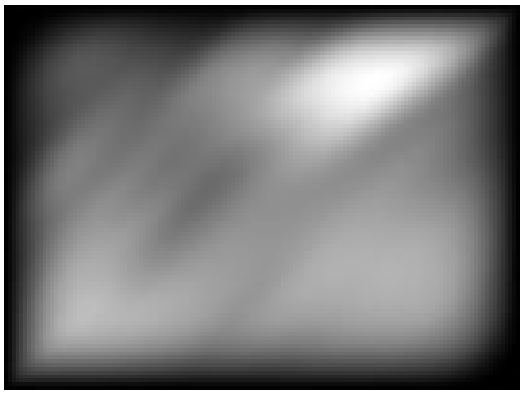

Figure 3: bike.ppm after 1000 iterations