Part 1

Program.cl

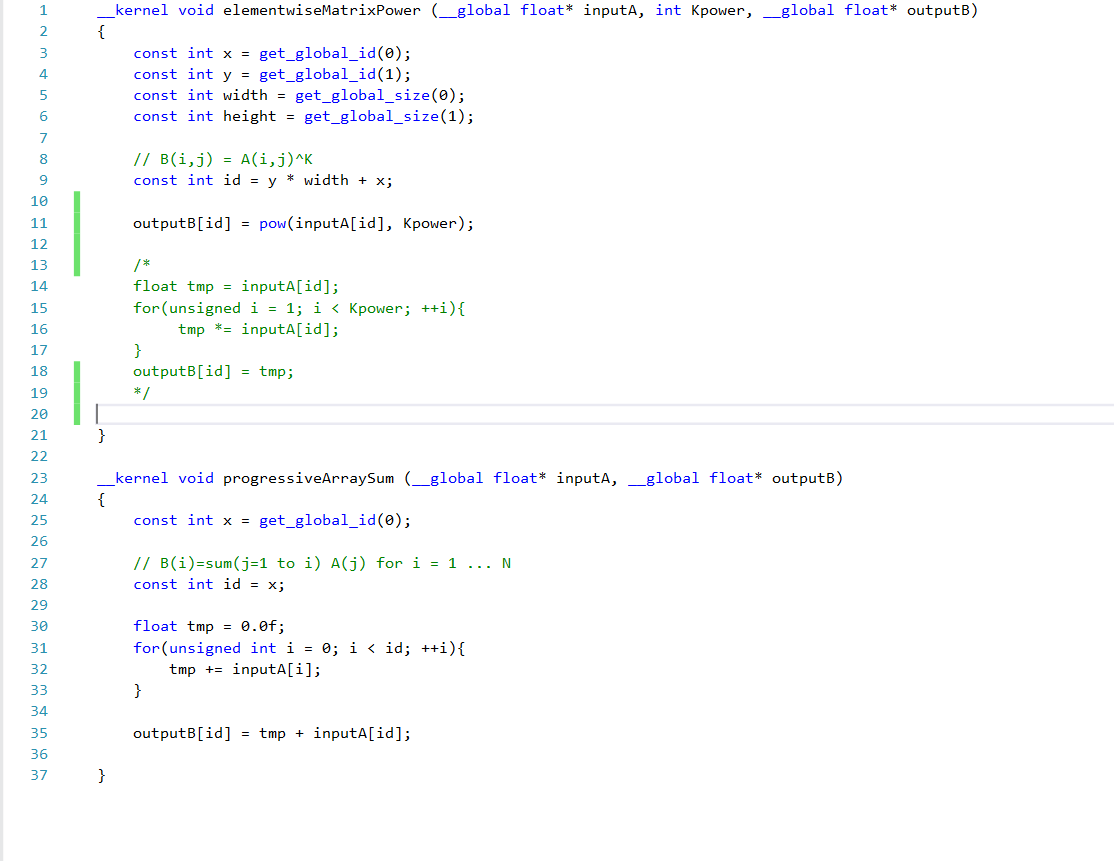


Figure-1

For elementwiseMatrixPower, both the manual and kernel function pow() works. And they are verified with matlab output shown in figure-2,3,4.

Some output might fail due to floating point precision and overflow. Kernel built using single precision floating value.

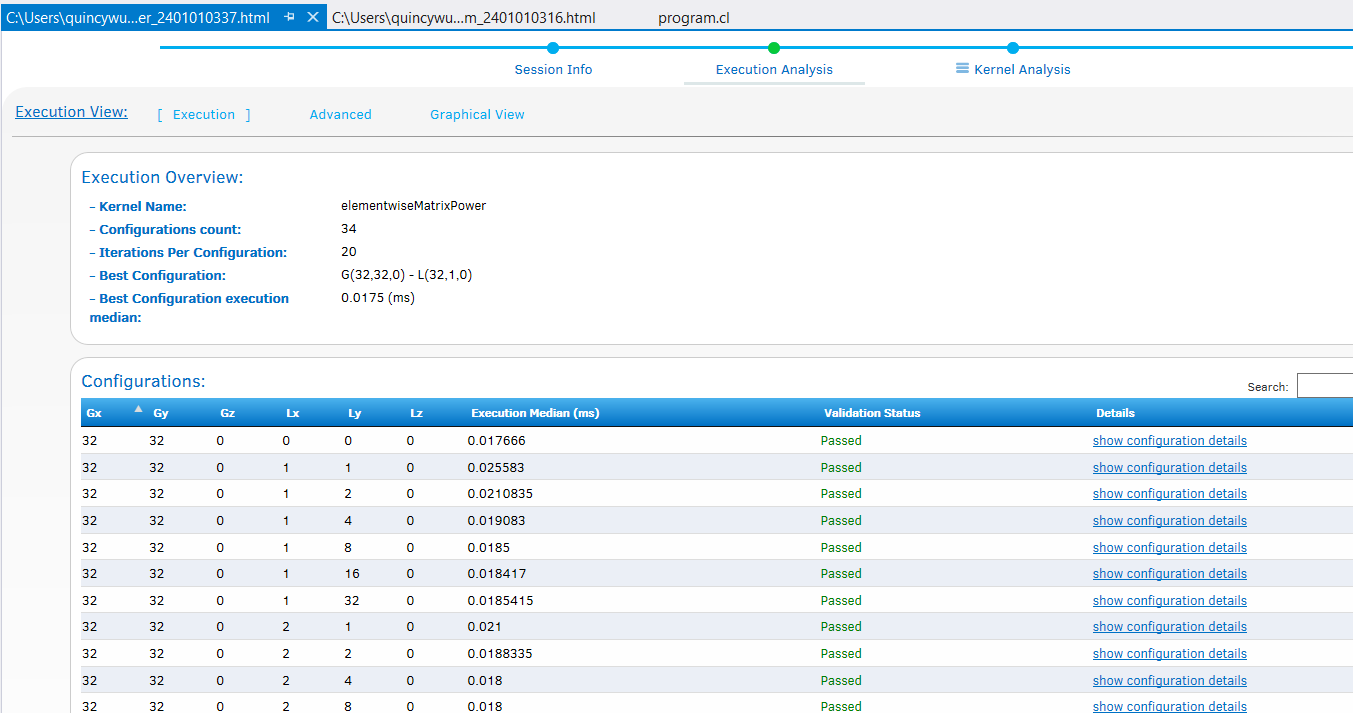
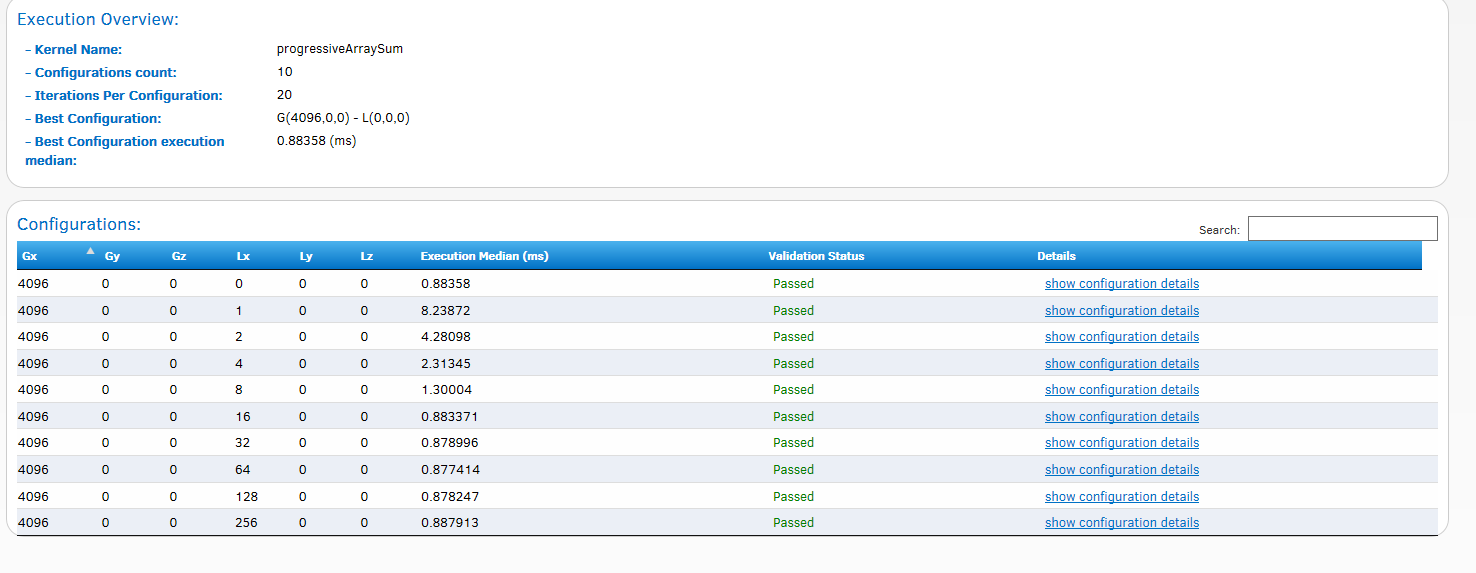
elementwiseMatrixPower

Figure-2

progressiveArraySum

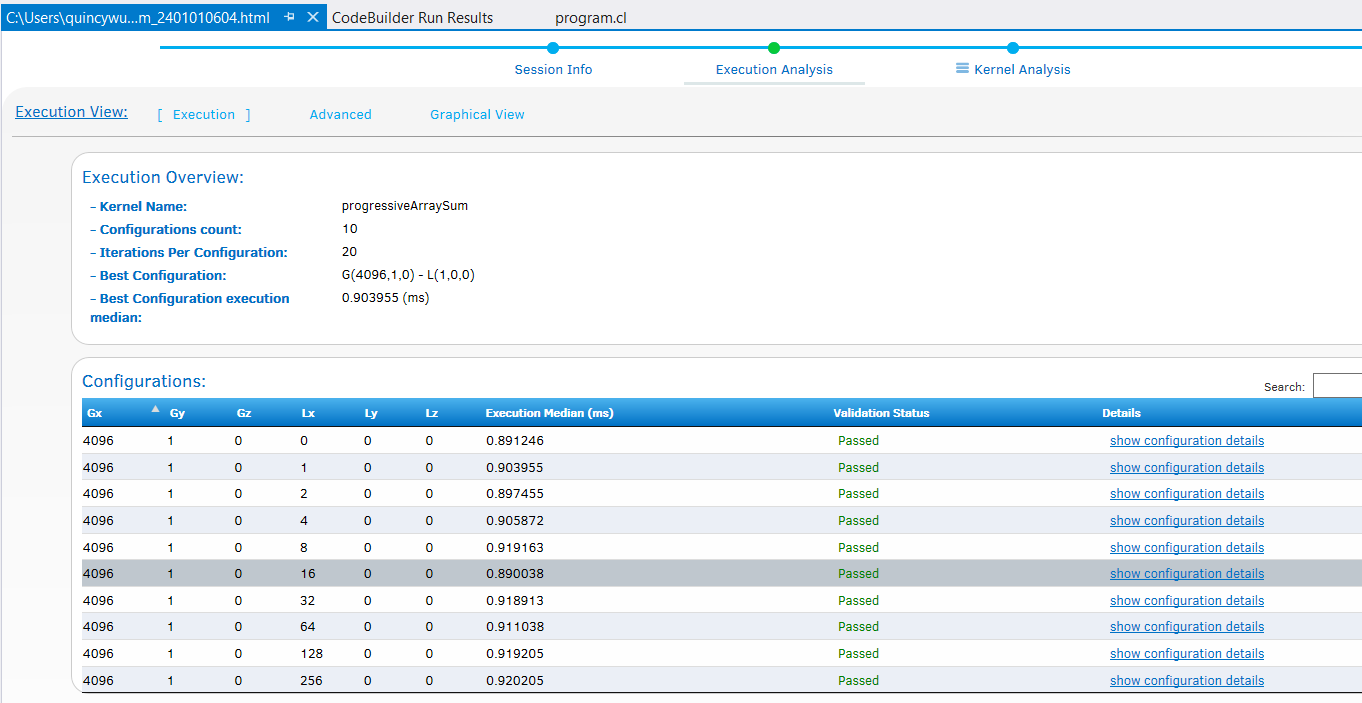


Figure-3, 4

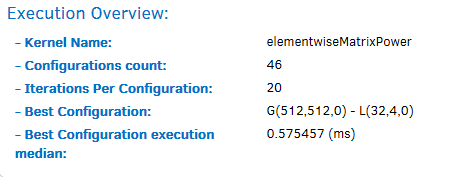
Part 2

Using Global sizes

* + - 1. elementwiseMatrixPower = {512,512,0}
      2. progressiveArraySum ={4096,0,0}

Using random number generated by kernel. Tested on smaller size and restricted input, output is correct. Without restricting input, output would be incorrect due to floating point precision error.

Built using GPU targets



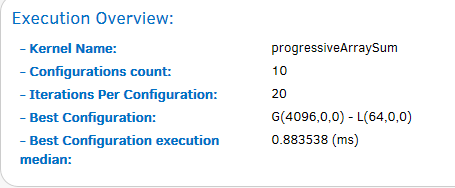
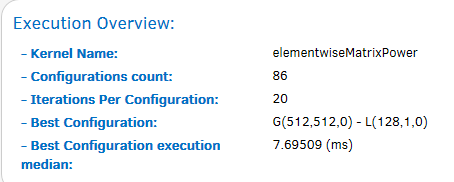


Figure-5, 6

Built using CPU targets



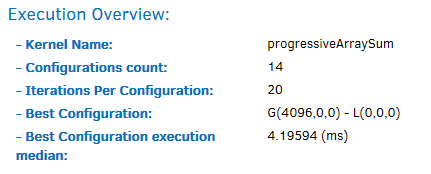
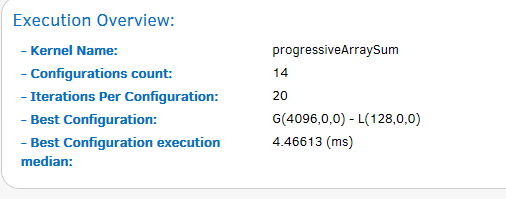
 

Figure-7, 8, 9

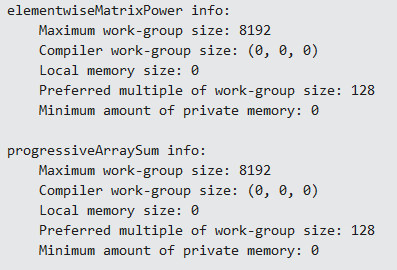


Figure-10 CPU Preferreed multiple of work-group size

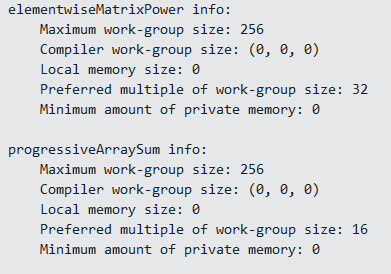


Figure-11 GPU Preferreed multiple of work-group size

For CPU, the Preferreed multiple of work-group size is **128**, the same for both kernel, and it is shown in the execution overview on Figure 7, 9. The best configuration is matching the work-group size **128**. In Figure 8, Best Configuration local work group size is (0, 0, 0). It might be due the problem size is too small, and setup overhead is more affecting the result.

For GPU, the preferred multiple of work-group size is different for both kernel. They are also different from the best configuration on kernel by runtime. elementwiseMatrixPower, has the preferred work-group size of **32**, while the best configuration work-group size is **(32, 4, 0).** The progressiveArraySum has preferred work-group size of 16, while the best configuration work-group size determined by runtime is **(64, 0, 0)**. The difference might due to number of iteration ran on the kernel is not enough and theory for preferred work-group size might be different than runtime determined work group size.

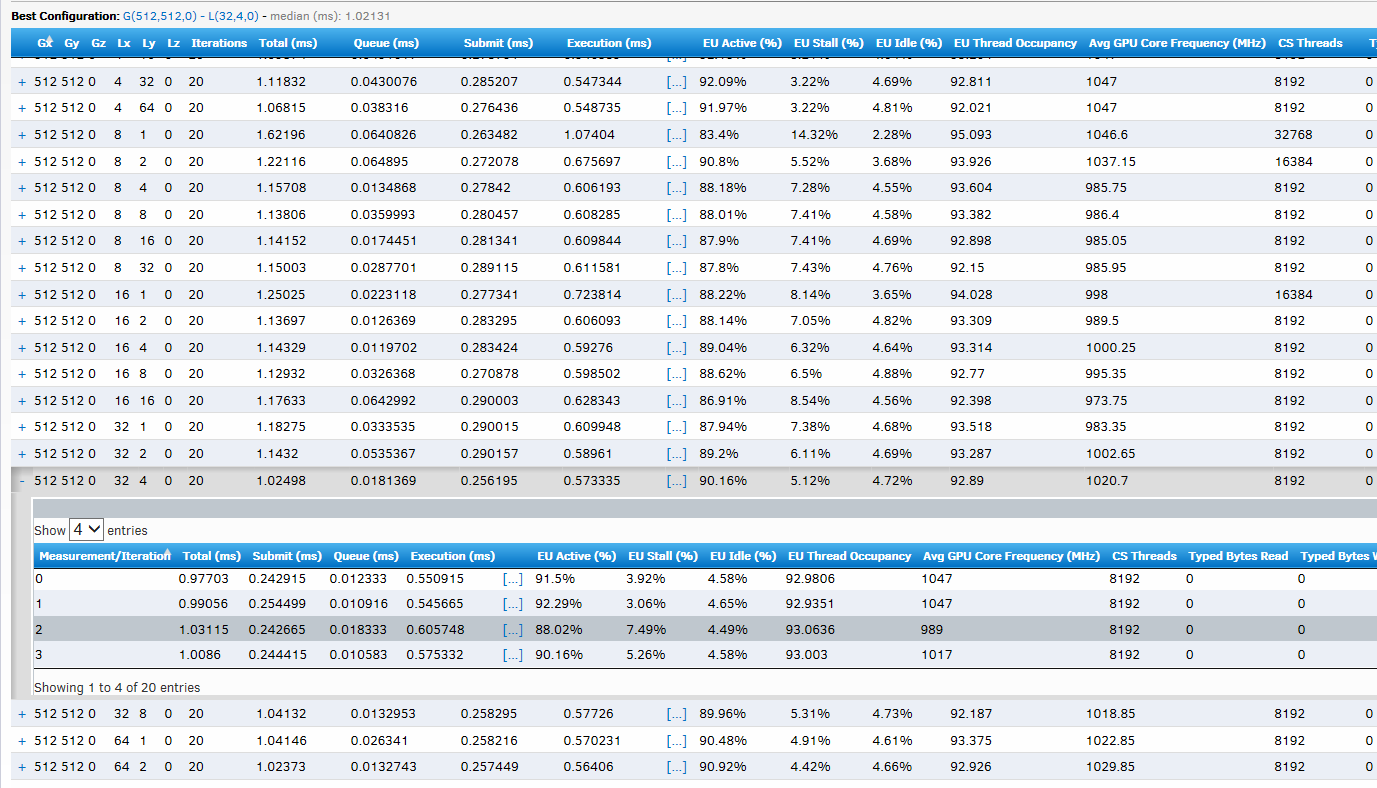
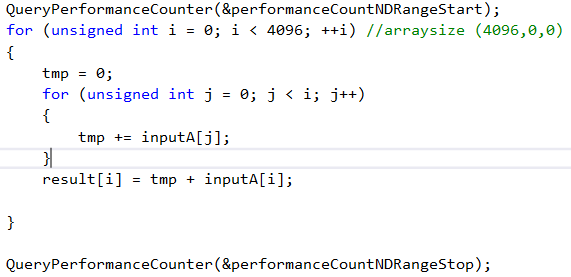
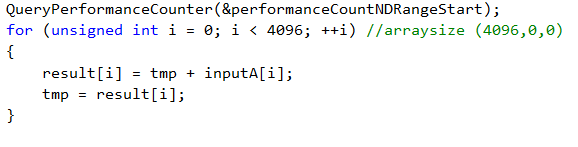
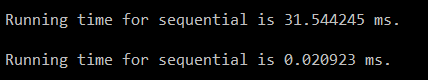


Figure -12 Advance option on execution analysis

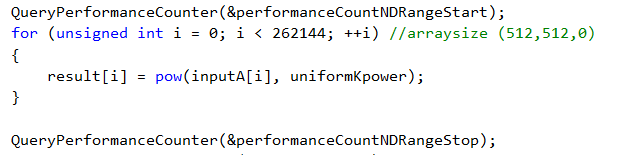
GPU







progressiveArraySum



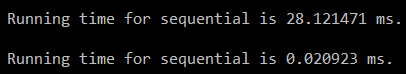


elementwisePower

CPU



elementwisePower



progressiveArraySum