Part2: Write Up

Like part1 of the assignment, I generated C++ code using Python to do loop unrolling however, this time it was with reduction loops for ILP. This time I focused on chunking the array where it is divided into N equal sized chunks (N is the unroll factor). There is also one clean up loop to calculate the first element of each chunk of the array.

After running the loop with unroll factor of 1, 2, 4, 8, 16 and 64, the results were not what I expected. The performance peaked at an unroll factor of 4 with a speed up of 2x. However, all unroll factors greater than 4 quickly declined in speedup time. I believe this is caused by register spilling which makes load time more expensive.