Task 3: Loop Ordering and Matrix Multiplication

1. Which 2 orderings perform best for these 1000-by-1000 matrices? Write your answer in the form "[Ordering1], [Ordering2]" (e.g. "ijk, ijk").

“jki” and “kji” are the 2 orders that performs best for these 1000*1000 matrices.

Reasoning:

From the snapshot below we can see that for a 1000*1000 matrix the “Gflops/s” *Giga-floating point-operations per second* for the order “jki” and “kji” is greater than the other 4 possible combinations, also for *the innermost loop (the one that increments i)* the stride for **A and C is 1 but for B is 0.** Here the stride is the *minimum distance that needs to be covered in memory to move from one element to the next along that dimension* since the stride is minimum for these two cases that’s why these two orders performs the best for 1000*1000 matrices.

2. Which 2 orderings perform the worst?

“ikj” and “kij” are the 2 orders that performs the worst.

Reasoning:

If we examine the *innermost loop (the one that increments j)* the stride for the **A is 0 but for B and C it is n,** also the Gflops/s for the order “ikj” and “kij” is the minimum than the other 4 possible combinations,as shown below