# Sys-Intro Lab1 Report

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## Part 1: Loop orders

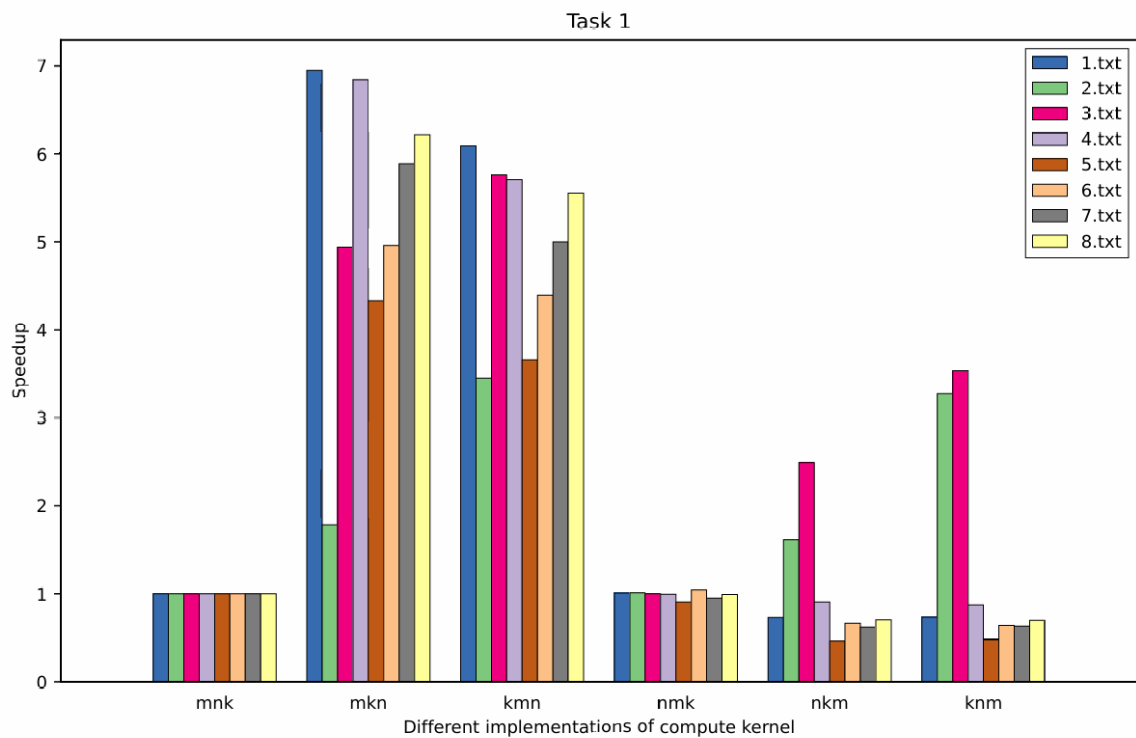The result of the first part is shown in Figure 1.



Figure 1: Part 1

# Part 2: Common techniques

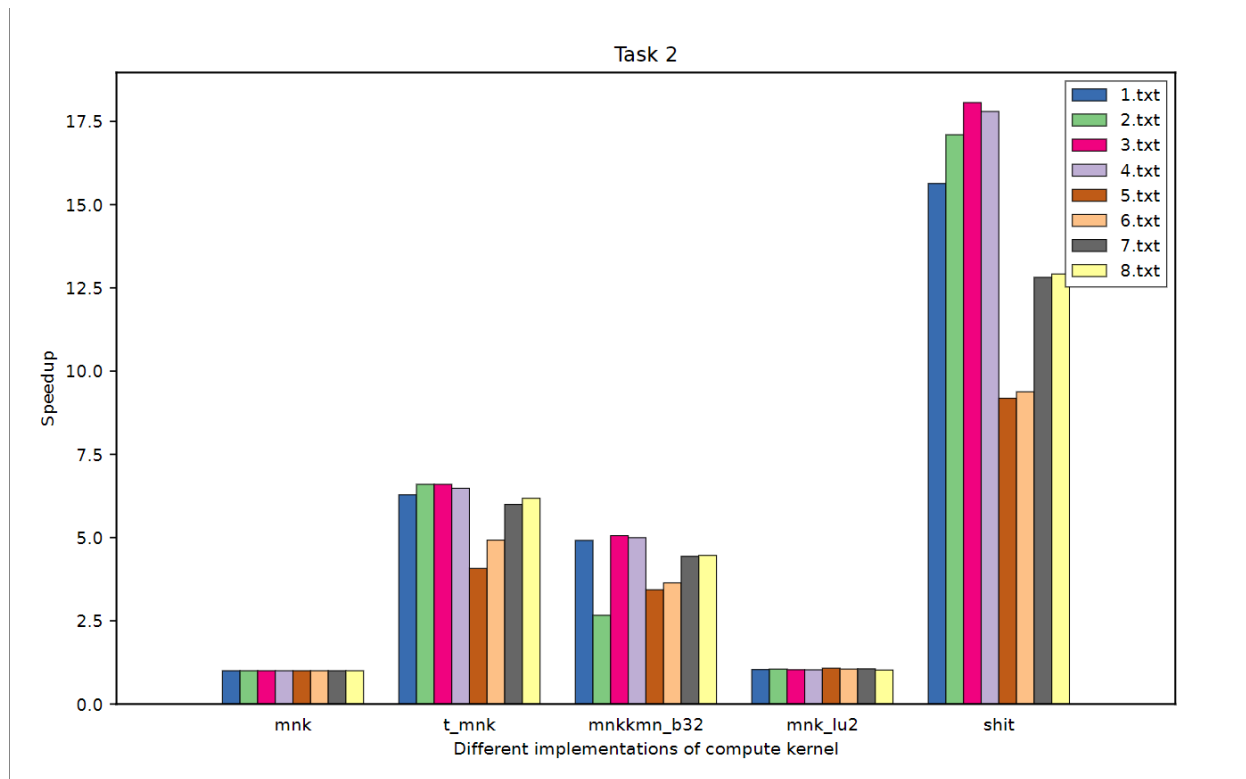The result of the second part is shown in Figure 2.



Figure 2: Part 2

From the figures above, we can conclude that the lu2 method provides limited speedup compared to baseline. The mnkkmn_b32 method achieves much better performance, and the t_mnk method is the fastest among all.

In addition, we further speed up the t_mnk method by using register and loop unrolling techniques, achieving approximately 10x acceleration against the baseline (displayed in the "shit" entry.)

# Part 3: With SIMD

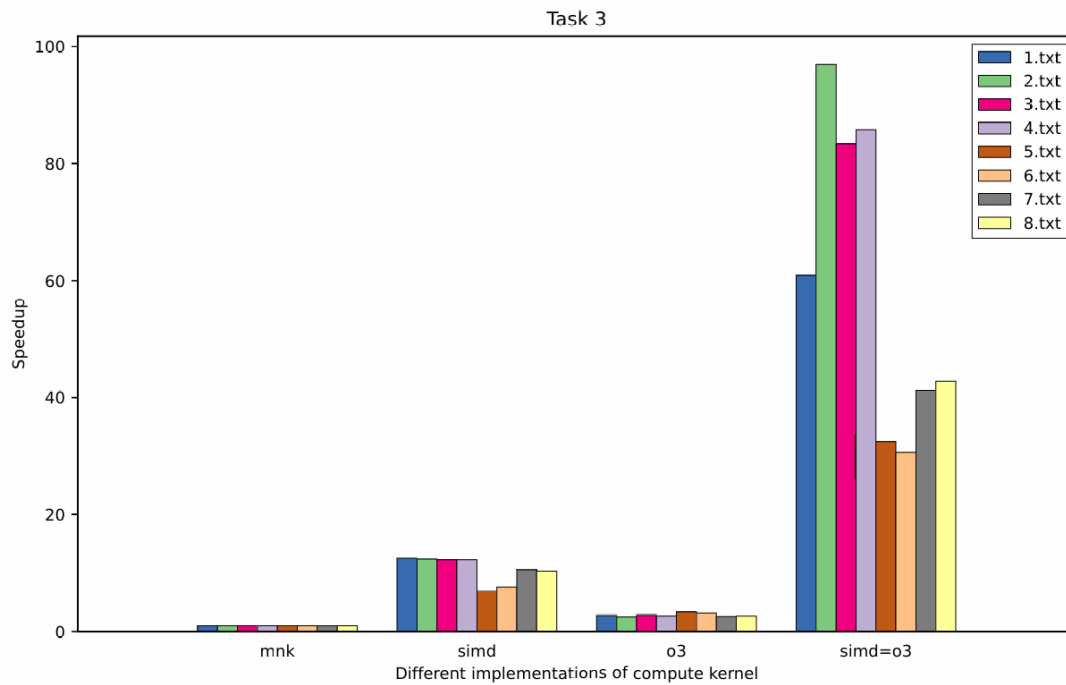The result of the third part is shown in Figure 3.



Figure 3: Part 3

With SIMD, we achieve more than 10 times speedup. When using SIMD combined with o3 optimization, nearly 100x acceleration is