

HW9 Q3 Response

The second version of this will take longer. If you look at `q3_output.c`, you'll see that second version takes 1.387734 times as long as version 1. Note that these weren't calculated with actual time values – rather, each cache hit was given a time value of 1 and each cache miss was given a time value of 50.

The reason for this is that version two exhibits bad spatial locality – it accesses items in the array with a stride-HALF reference pattern (thereby decreasing the hit-rate by quite a bit). On the other hand, version one exhibits good spatial locality – it accesses items in the array with a stride-1 reference pattern. Since version two has more cache misses than version one, it will run slower.