CS304 Assignment 3

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# Task 1:

CPU: Intel Core i7 8700

Cache:

L1: 384 KB

L2: 1.5 MB

L3: 12.0 MB

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| A size | M | N KB | Time per iteration (ns)  Case 1 | Time per iteration (ns)  Case 2 |
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Chart:

Discussion Points:

Case 1 increases through cache in a linear fashion, whereas case 2 works in a random fashion. Linear progression is faster as the CPU can access the different addresses sequentially, whereas the random progression is slower, and will take varying amounts of time depending on the order of the array randomly assigned.

# Task 2:

1. Time: Cache memory operates through rows, so Matrix A will operate through rows, as opposed to matrix b which operates through columns. By working through columns, the CPU will jump through multiple address not operating in a linear fashion.
2. Time:
3. Time:

By jumping through blocks jump size previously mentioned is smaller, and the cache can be accessed more efficiently, as blocks can fit into the cache, rather than accessing memory.