Problem 4

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| **Table 1: CPU, GPU, Nsight Execution Times, Speedup, and Global load counts** | | | | | |
| **Data Size** | **256** | **512** | **1024** | **2048** | **4096** |
| CPU Time (usecs) | 35 | 152 | 665 | 2650 | 10703 |
| GPU Time (usecs) | 55 | 73 | 113 | 270 | 350 |
| Speedup | 0.64 | 2.08 | 5.88 | 9.81 | 30.58 |
|  | | | | | |
| NSIGHT Time (usecs) | 27 | 52 | 101 | 197 | 392 |
| Speedup | 1.30 | 2.92 | 6.58 | 13.45 | 27.30 |
|  | | | | | |
| Global Loads | 4096 | 16384 | 65536 | 262144 | 1048576 |

From Table 1 the speedup computed using the NSight profiler is generally higher than the wall clock speedup except when tested with a sample size of 4096. It is likely that the number of wall clock trials needs to be increased to estimate the expected speedup more accurately. It is evident from the global load counts that the solution provided for this matrix vector multiplication problem does not use much if any shared memory and certainly does not utilize a tile approach.