ME759
High Performance Computing for Engineering Applications
Date Assigned: October 14, 2013
Date Due: October 21, 2013
Cutoff Time: 11:59 PM

In this problem, you will have to produce a version V5 and a version V6 of the 1D
Stencil code that we used in class. To this end, start with the **testV4.cu** version
provided in HW directory.

testV5.cu: Use shared memory to speed up your execution.
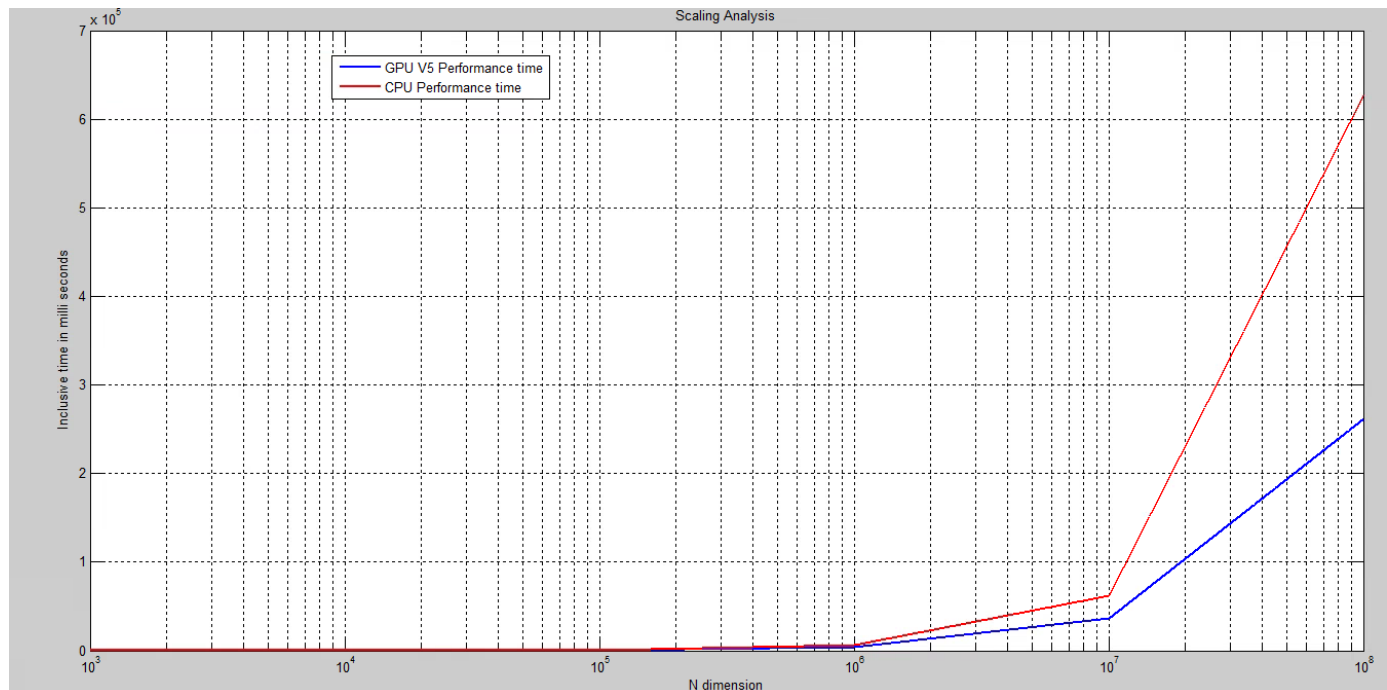
testV6.cu: Builds on top of V5 and reduces the run time by considering pinned host
memory transactions.

What you will have to deliver:

a) Run a scaling analysis using N=103, 104, 105, …108 elements and generate a **png**
plot that shows GPU-V5 performance against CPU performance. Upload this plot
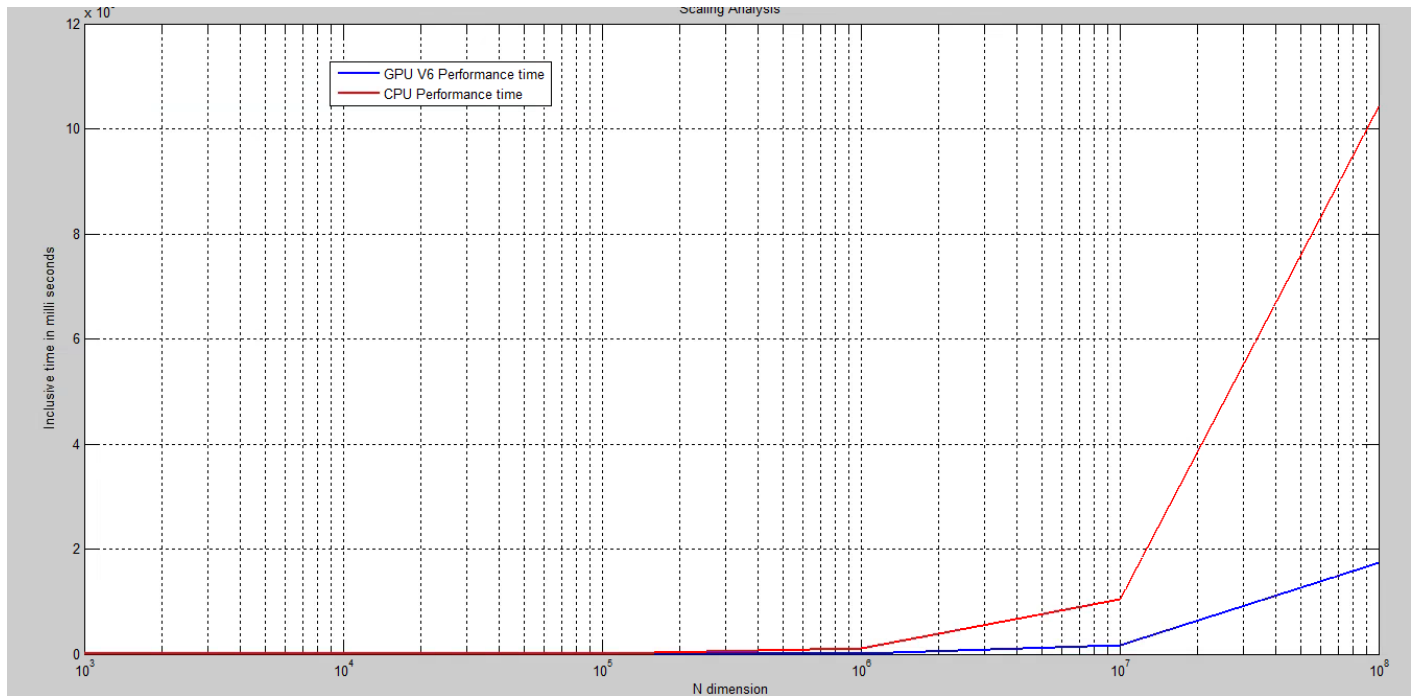onto the Forum.

Answer:

Plot: (LOG SCALE):

b) The same as above, but shows GPU-V6 performance against CPU performance
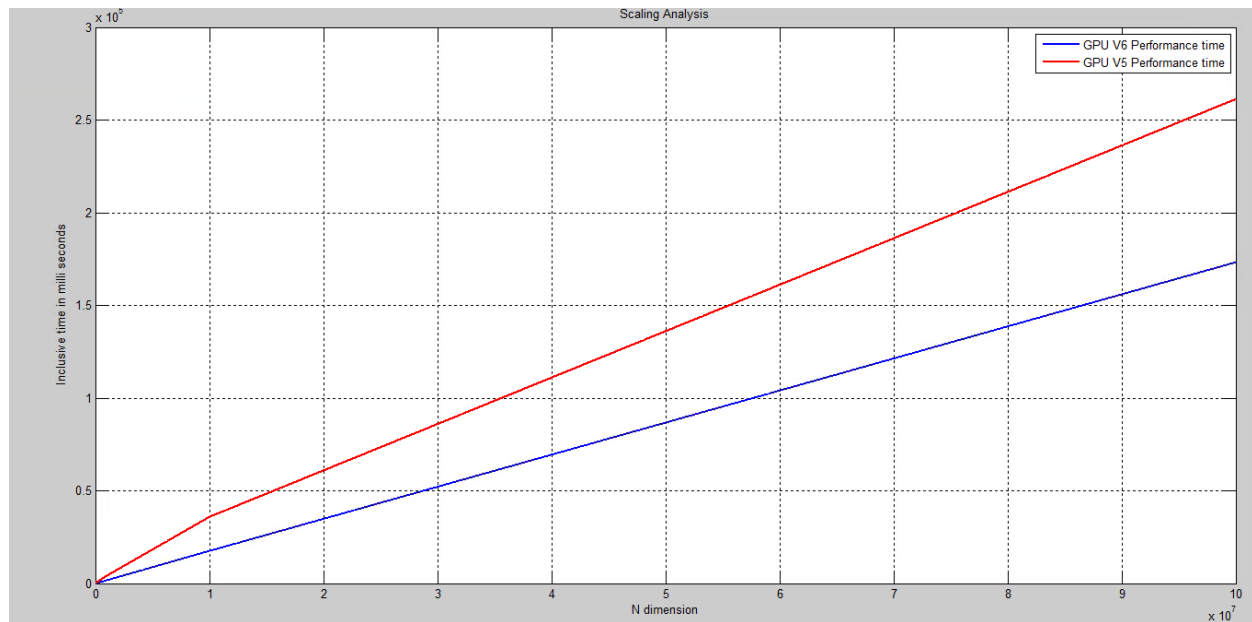
Answer: Plot: (LOG SCALE)

c) Generate a png plot that shows the GPU-V5 performance against GPU-V6 performance.

Answer:

Plot: (LINEAR SCALE)

d) What change has had more impact? Why is that the case?
Answer:
The change after pinning the memory on the host has more impact than 'weights' and 'in' being stored in the Shared Memory. Pinned memory is memory allocated using the *cudaMallocHost* function, which prevents the memory from being swapped out and provides improved transfer speeds. So, it has more impact than storing 'weights' and 'in' variables in shared memory

Grading.
Your submission will be graded as follows:
i) Functionality: 40%
- Program runs on Euler, producing correct results.
ii) Report: 60%
- You provide correct results for a) through d) above.