

1) The Roofline model

Memory Bandwidth: Results from STREAM.

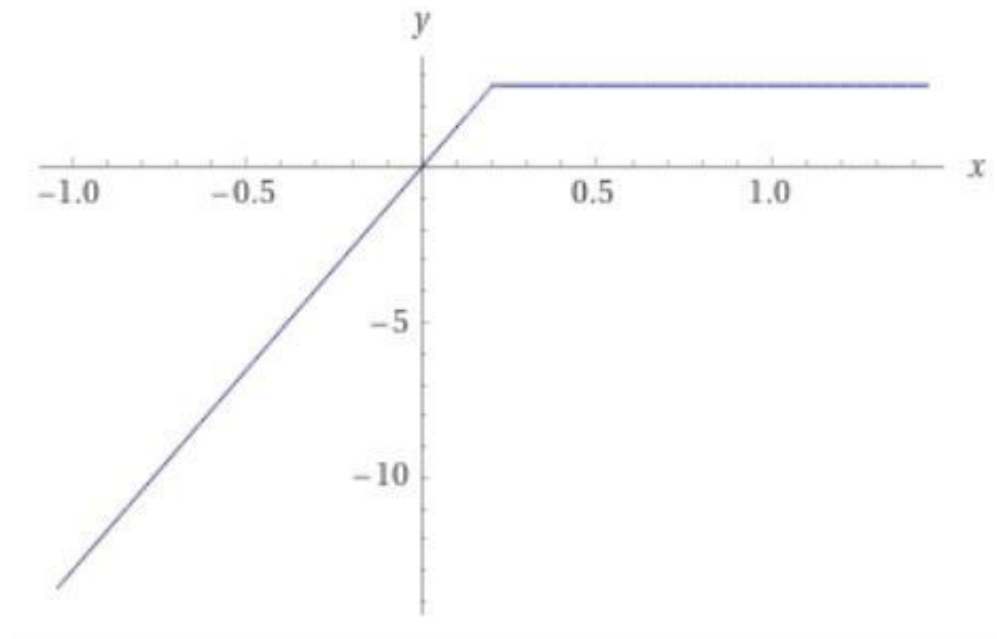
Max Bandwidth= 13376.8 MB/s= 13.063 GB/s

FLOP Throughput: Results from Intel MKL.

Max FLOPs/s= 42.0671 GFLOPS/15.852 s

= 2.654 GFlops/s

Graph:



2) Arithmetic Intensity: Number of operations per loop= 4(Similar to the operation in the slides), Data transferred in one loop= 3\*32 bytes.

Intensity=  $4/(3*32) = 1/12$

Substituting the intensity, the graph coincides at 1.08858. The program is Memory Bound.

3) Comparison Graph (I just couldn't get the graph to work in time, so instead of a point, there is a line)

