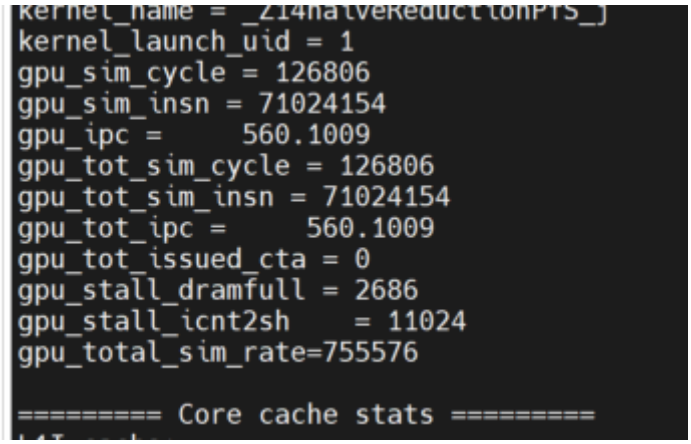
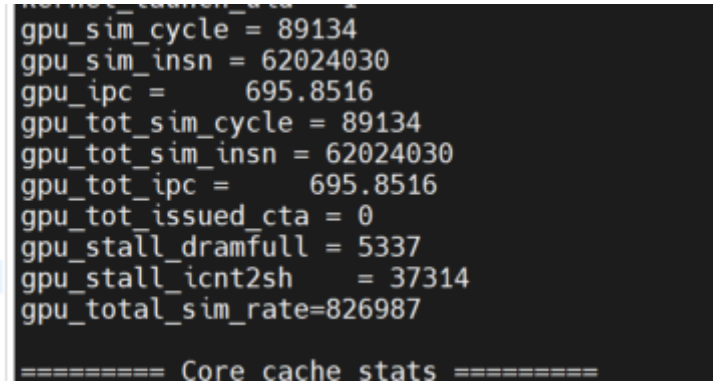
1. Only the first step executes without divergence.
   Others 8 steps execute with divergence.

2. The first 4 steps execute without divergence.
   The final 5 steps execute with divergence

3. Naïve reduction:

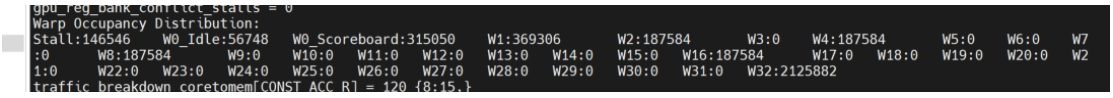


   Optimized reduction:

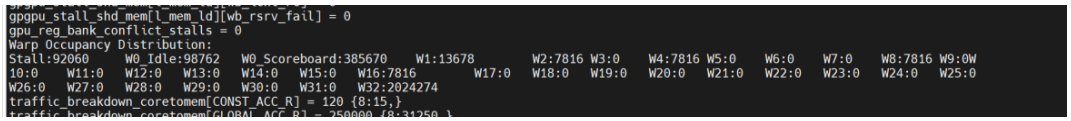


   number of cycles for optimized reduction is less than naïve reduction, thus optimized reduction performed better.

4. Naïve reduction:



   Optimized reduction:



5. Programs need to follow SIMT fashion of execution and execution of different instructions on different threads lead to different instructions executing in a warp.