**CSE-467 - Parallel and Distributed Computing**

**Assignment No 7**

**Design PRAM model for Linear regression and implement that in CUDA.**

**Design EREW-PRAM model for linear regression for 16 elements and then implement it in CUDA-C or CUDA-Python for N elements. Compare the sequential implementation with parallel implementation. Fill execution time in the following table for the given values of N. You can implement the solution with local shared variable among threads within a block and with global variable shared among all blocks.**

|  |  |  |  |
| --- | --- | --- | --- |
| **N**  **(Array length)** | **Sequential** | **Parallel on GPU** | |
| **Shared variable**  **Partial Sums** | **Global variable**  **One Final Sum** |
| **1 x 106** | **49572us** | **2890us** | **192us** |
| **10 x 106** | **366887us** | **28124us** | **1200us** |
| **20 x 106** | **729070us** | **56145us** | **2300us** |
| **35 x 106** | **1s 1330925us** | **90196us** | **3972us** |
| **40 x 106** | **2s 2095205us** | **102219us** | **4538us** |
| **50 x 106** | **2s 1995478us** | **140269us** | **5662us** |