

## HPC ASSIGNMENT 4

### Ag7890

Q1)

Vector. Vector Multiplication:  $N = 2^{25}$

Machine	Bandwidth (GB/s)	Error
CPU	29.713857 GB/s	
Cuda 1	131.284537 GB/s	0.000
Cuda 2	374.222815 GB/s	0.000
Cuda 3	594.828652 GB/s	0.000
Cuda 4	142.363143 GB/s	0.000
Cuda 5	108.725664 GB/s	0.000

Matrix Vector Multiplication:  $N = 2^{10}$

Machine	Bandwidth (GB/s)	Error
CPU	0.388898 GB/s	
Cuda 1	0.425521 GB/s	0.000
Cuda 2	0.003653 GB/s	0.000
Cuda 3	0.582786 GB/s	0.000
Cuda 4	0.435271 GB/s	0.000
Cuda 5	0.328229 GB/s	0.000

Q2) Jacobi

$N = 2^7$

Machine	Time	Res
CPU	0.388898 GB/s	
Cuda 1	0.475633s	0.613296
Cuda 2	0.621695s	0.613296
Cuda 3	0.696567s	0.613296
Cuda 4	0.552228s	0.613296
Cuda 5	0.626191s	0.613296

Q3)

TOPIC: Parallel Fraudulent Transaction Detection in Ethereum Blockchain data using MPI

Proposed Steps:

- 1) Setup of Greene Cluster. - COMPLETED
- 2) Data sourcing, parsing and transformation - COMPLETED
  - a) Parallel read of dataset by multiple processors - COMPLETED
- 3) Distributed Transaction Graph construction:
  - a) Parallel Sort to globally sort addresses using processor communication - COMPLETED
  - b) Mapping addresses to global id of sorted addresses using processor communication - COMPLETED
  - c) Grouping transactions to form adjacency lists - TO BE COMPLETED
- 4) Distributed Blacklisted Node Trace Forest Creation
  - a) Local operations within the processor - COMPLETED
  - b) Communication between processors - TO BE COMPLETED
  - c) Cumulative Forest - TO BE COMPLETED