

# HPC - homework 4

## Pingpong

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```
pingpong latency: 2.707637e-02 ms  
pingpong bandwidth: 1.286369e+01 GB/s
```

## Int Ring

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How to compile and run program

```
mpic++ -std=c++11 -O3 -march=native -fopenmp int_ring.c -o int_ring mpirun -np 3 --oversubscribe ./int_ring 10
```

## Results

**25 processes, 1000 Repeats**

```
int ring latency: 1.710104e+03 ms  
result: 300000
```

The average latency for each communication is 68.4 us

## Scan MPI

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How to compile and run program

```
mpic++ -std=c++11 -O3 -march=native -fopenmp scan_mpi.c -o scan_mpi mpirun -np 3 --oversubscribe ./scan_mpi 10
```

## Project

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Name: k-means clustering

Plan:

- implement a serial version of the algorithm
- modify it to work with MPI
- apply to 2 datasets
  - text data is easier to preprocess
  - convert text to vectors
  - apply k-means algorithm

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