COMS3008A Assignment – Report

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1 Problem 1: Parallel Scan

- Given a set of elements, $[a_0, a_1, \cdots, a_{n-1}]$, the scan operation associated with addition operator for this input is the output set $[a_0, (a_0 + a_1), \cdots, (a_0 + a_1 + \cdots + a_{n-1})]$.
- For example, the input set is $[2,1,4,0,3,7,6,3]$, then the scan with addition operator of this input is $[2,3,7,7,10,17,23,26]$.

1.1 Serial Implementation:

Firstly I started off with the baseline implementation of serial scan operation.

```
1  void scan(int out[], int in[], int N){
2    out[0] = in[0];
3
4    for(int i=1; i<N; i++) {
5      out[i] = in[i] + out[i-1];
6    }
7  }
```

Listing 1: Sequential algorithm for computing scan operation with '+' operator

2 Problem 2: Parallel Bitonic Sort

The bitonic sort is based on the idea of sorting network. The bitonic sorting algorithm is suitable for parallel processing, especially for GPU sorting. **However, in this problem, you are requested to implement parallel bitonic sorting of integers using OpenMP and MPI, respectively.**

Another paragraph starts ...

3 Problem 3: Parallel Graph Algorithm

An example figure is given in Figure 1.

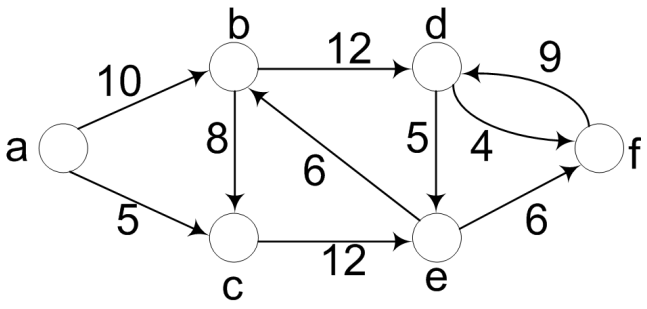

Figure 1: A directed graph

An example of table is given Table 1.

Table 1: An example of a table

No of vertices	64	128	256	384	512
Serial	0.1	0.2	0.3	0.4	0.5
Parallel					
Sppedup	2	3	4	5	6