**CME213, Spring 2022**
**Parallel Computing**
**Julian Cooper**

## Homework 1
## Due Friday, April 8th via GradeScope

**Problem 1:** Implement a parallel function that sums separately the odd and even values of a vector.

Idea: Need to implement `parallelSum` using `omp parallel for` with reductions for both even and odd accumulators.

```
std::vector<uint> parallelSum(const std::vector<uint> &v)
{
    omp_set_num_threads(4);
    std::vector<uint> sums(2);
    uint sum0 = 0; uint sum1 = 0;

    #pragma omp parallel for reduction(+:sum0) reduction(+:sum1)
    for(uint i=0; i<v.size(); i++) {
        if (v[i] % 2 == 0) {
            sum0 += v[i];
        }
        else {
            sum1 += v[i];
        }
    }
    sums[0] = sum0; sums[1] = sum1;
    return sums;
}
```

Console logs from `main_q1.cpp`.

```
$ make main_q1
g++ -std=c++11 -g -Wall -O3 -fopenmp main_q1.cpp -o main_q1

$ ./main_q1
Parallel
Sum Even: 757361650
Sum Odd: 742539102
Time: 0.00433168
Serial
Sum Even: 757361650
Sum Odd: 742539102
Time: 0.106256
main_q1.cpp:60:main     TEST PASSED.
```

**Problem 2:** ...

Submission information logs.

```
$ /afs/ir.stanford.edu/class/cme213/script/submit.py hw1 private/cme213-jelc53/hw1
Submission for assignment 'hw1' as user 'jelc'
Attempt 1/10
Time stamp: 2022-04-01 20:53
List of files being copied:
    private/cme213-jelc53/hw1/main_q1.cpp  [3875 bytes]
    private/cme213-jelc53/hw1/main_q2.cpp  [1213 bytes]
    private/cme213-jelc53/hw1/main_q3.cpp  [1362 bytes]
    private/cme213-jelc53/hw1/main_q4.cpp  [5117 bytes]
    private/cme213-jelc53/hw1/matrix.hpp  [3036 bytes]

Your files were copied successfully.
Directory where files were copied: /afs/ir.stanford.edu/class/cme213/submissions/hw1/jel
List of files in this directory:
    main_q1.cpp  [3875 bytes]
    main_q2.cpp  [1213 bytes]
    main_q3.cpp  [1362 bytes]
    main_q4.cpp  [5117 bytes]
    matrix.hpp  [3036 bytes]
    metadata  [137 bytes]

This completes the submission process. Thank you!
```