CS 133 Parallel and Distributed Computing
Winter 2019
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Homework #1

Reading assignment:
Lecture notes 1 and 2.

Homework problems:

1. Find out the number of cores of the processors in your cell phone and laptop/desktop. Specify their types, if known.

2. What is Dennard Scaling? Why did it breakdown?

3. Please compute the power efficiency of the Top-10 supercomputers announced in Nov. 2018, and list the top-3 most power efficient supercomputers. Please use the measurement in terms of Rmax/Power (you can compute only those whose Power numbers are available).

4. Please give an example that we don't know the number of tasks ahead of time.

5. In the lecture, we discussed the example shown on the right, which has a loop pipelining initiation interval equal to 2. If we only want to output d[SIZE], can you rewrite the code so that the II becomes 1?

```
i = 1;
for (i=1; i<=SIZE; i++) {
    d[i] = d[i-1]*v[i];
}
```

Late submission policy:
We allow one-day delay with 10% penalty. After that, no submission will be accepted and the solutions may be discussed in the discussion sessions.