

## Parallel Programming Exercise

13-Nov-17

**Synchronization:** Write a parallel program which takes a random vector  $a$ , squares each term, and then scales the result so that the  $l^2$ -norm of the new  $a$  is 1.

E.g., for  $a = [1\ 2\ 3]$ :

$$a \leftarrow [1\ 4\ 9]$$

$$a \leftarrow a / \sqrt{1 + 16 + 81}$$

**Work Sharing:** Parallelize the following loops:

```
for ( i = 0; i < n-1; i++ )
    a[i] = a[i+1] + b[i] * c[i];
```

```
for ( i = 1; i < n; i++ )
    a[i] = a[i-1] + b[i] * c[i];
```

```
t = 1;
for ( i = 0; i < n-1; i++ ) {
    a[i] = a[i+1] + b[i] * c[i];
    t = t * a[i];
}
```

What if  $a$  is large and so can't be made private?