Parallelism vs. Concurrency

Parallelism: Use extra resources (i.e. processors) to solve your problem faster

Concurrency: Correctly and efficiently sharing a single resource among multiple threads.

Terms aren't completely standard.

They overlap somewhat.

7

ParallelSum: Take 1

There are major bugs with this code. Find some of them!

```
int sum(int[] arr){
    int len = arr.length;
    int ans = 0;
    SumThread[] ts = new SumThread[4];
    for(int i=0; i<4; i++)
       ts[i] = new SumThread(arr,i*len/4,(i+1)*len/4);
    for(int i=0; i<4; i++)
       ans += ts[i].ans;
    return ans;
}
```

17

Divide and Conquer SumThread

```
Class SumThread extends SomeThreadObject{
  //constructor, fields unchanged.
  void run(){
    if(hi-lo == 1)
      ans = arr[lo]
    else{
     SumThread left = new SumThread(arr, lo, (hi+lo)/2);
     SumThread right = new SumThread(arr, (hi+lo)/2, hi);
     left.start(); right.start();
     left.join(); right.join();
     ans = left.ans + right.ans;
    }
  }
}
```

29

Divide And Conqure SumThread

```
int sum(int[] arr){
  SumThread t = new SumThread(arr, 0, arr.length);
  t.run(); //this call isn't making a new thread
  return t.ans;
}
```

30