

CSE 332: Data Abstractions

QuickCheck: Parallelism Solutions (due Thursday, February 11)

0. Work it Out [the Span]

Consider the following code which returns the average value in a perfect binary tree:

```
1  int findAverage (Node n) {  
2      if(n != null){  
3          if (n.left == null && n.right == null) {  
4              return n.value;  
5          } else {  
6              return (n.value + (findAverage(n.left) + findAverage(n.right)) * (2 ^ (h - 1) - 1)) / 2 ^  
7                  h - 1;  
8          }  
9      }  
}
```

Find the work and span of the function.

Solution:

See lecture slides - work is $\mathcal{O}(n)$, span is $\mathcal{O}(\lg(n))$.