

Hands On 6

3. Mathematically derive the average runtime complexity of a non-random pivot version of quicksort.

$$T(n) = 2T(n/2) + O(n)$$

Assuming an even split

$$a=2, b=2, d=1$$

$$a \geq 1, b > 1, d \geq 0$$

We can use the master's theorem

$$\boxed{\Theta(n^d \lg(n))} \quad \text{because } a = b^d$$

$$2 = 2^1$$