

580: Algorithms
Tutorial 2

1. (Part of a 2015 exam question.)

- (a) Using either Java or pseudocode, write a recursive procedure $\text{POW}(x, N)$ to compute x^N , where N is a positive integer. Use a divide and conquer strategy. *Hint:*

$$x^N = x^{N/2} \times x^{N/2} \quad \text{for even } N$$

$$x^N = x^{(N-1)/2} \times x^{(N-1)/2} \times x \quad \text{for odd } N.$$

- (b) Write recurrence expressions for the time complexity $T(N)$ of your Pow procedure in the following cases:

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- (c) Solve your expressions for $T(N)$ using the ma

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