# Assignment 10: Boolean Expressions, Normal Forms and Landau Sets

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## 1 Problem 4

- $\pi \in O(n)$: Since the function calls itself once for every number until it reaches 0. So in other words is called n times.
- $\mu \in O(n^2)$: This function calls itself n times, but in every call it also calls the function $\pi$ which is of complexity $O(n)$ so it's basically calling a function of complexity $O(n)$ $n$ times so the complexity is $O(n^2)$.
- $\epsilon \in O(n^3)$: Since it's basically defined as multiplying $n$ times therefore $\epsilon \in O(n * n^2)$.
- *gigatwist* $\in O(n^n)$: A function work is declared with parameter $n$. This function calls nextwork which invokes the work function again, now defined with $n - 1$ as parameter and keeps doing so until it reaches 1. On the way up from the recursion, each of this n iterations now calls nextwork recursively for every element of the list ($n$ times as well). So in summary a function called $n$ times calls a funtion that is called $n$ times recursively therefore we get $O(n^n)$.