Name: _____
UCFID: _____
NID: _____

1) (10 pts) ANL (Algorithm Analysis)

Consider the following function that takes a list of **unique** integers for input

1. The list is empty return 0
2. Choose a random integer, `x`, from the list
3. Place every value from the list less than the value `x` in list 1 every value greater than `x` in list 2.
4. Run this function on list 1 and store the result in a variable called `left_answer`.
5. Run this function on list 2 and store the result a variable called `right_answer`.
6. Add to the answer the function run on list 2
7. Return the value `left_answer + right_answer + x`

What is the best case runtime and the worst case runtime for the above function, in terms of the input list size, **n**? What standard algorithm taught in COP 3502 is this algorithm closest to? In terms of that standard algorithm, what does the return value of this function represent? Provide proof of the runtimes, but in doing so, you may use results about known algorithms from COP 3502 without proving those results.