

CSC236 – Tutorial 6: Divide-and-Conquer

Exercise 1: Majority

Here's one that's based on an old test question.

A **majority** element of a list is an element that occurs as more than half of the elements of the list. For example, 4 is the majority element of [2, 4, 4, 4, 4, 3], and [2, 2, 3, 3] has no majority element.

Develop a $\Theta(n \lg n)$ divide-and-conquer algorithm that returns the majority element if the list has a majority element, or **None** if the list has no majority element. It's possible that the elements of the list are **not** orderable, so reducing to sorting is not a solution here.

```
def majority(lst):  
    '''Pre: lst is a list of non-none elements  
    Post: returns the majority element of lst, or None if no majority  
    '''
```