CS 325 Group Project 1

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Scenario

You are a visitor at a political convention with n delegates; each delegate is a member of exactly one political party. It is impossible to tell which political party any delegate belongs to; in particular, you will be summarily ejected from the convention if you ask.

However, you can determine whether any pair of delegates belong to the same party by introducing them to each other. Members of the same political party always greet each other with smiles and friendly handshakes; members of dffierent parties always greet each other with angry stares and insults.

Suppose more than half of the delegates belong to the same political party. Describe an efficient algorithm that finds out the size of the majority party. The efficiency of your algorithms is measured in terms of the number of pairs of delegates that you introduce to each other. We expect that you need about $O(n \log n)$ handshakes.

Description

Our algorithm uses a recursive method to divide and conquer the convention to find the majority in $2n \log n$ time.

- We create a list of all n delegates and call our recursive function on this list.
- This recursive function splits the list into two and calls itself on each half to find the majority party and size thereof of each half.
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Runtime Analysis

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