Solution

(a) It is more efficient to keep the phone book open because searches for consecutive words in the dictionary will take you to consecutive positions in the phone book.

More precisely, because both lists are arranged alphabetically, later words in the dictionary will also occur later in the phone book. Closing the phone book throws away the last checked position, which is a lower bound on the position of the next word, and usually a tight one.

Additionally, with the phone book open, you could perform reverse look-up to skip sections of the dictionary. After searching for Brooks in the phone book, for example, you could look at the next name in the phone book. If it were Brown, for example, then you could skip forward to "brown" in the dictionary. This saves looking up all the dictionary words between "brooks" and "brown".

(b) The best solution is as follows: One of you starts with A, working forward, and the other with Z, working backward. In order to avoid frequent checks, agree on an approximate half-way point before starting. When one of you reaches the half-way point, announce it, and settle on a new half-way point for the remaining portion. Repeat until no words are left.

One starting at A and the other starting at N, both working forward, is also a solution, but not quite as good because you might run out of words in your half before your friend has finished and have to move to a different part of the dictionary/phone book.

A poor solution is to alternate words. This requires both of you to scan the entire phone book, rather than only half of it each.

(c) The second approach in (b) generalizes. Decide on a division into three parts of approximately equal size. When one of you finishes the assigned section, divide the remaining work and repeat.